Advances in Asian Human-Environmental Research

K.R. Dikshit
Jutta K. Dikshit

North-East India: Land, People and Economy

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Preface

For the authors of this book, stationed 2,000 km away from North-East India, to write a book on this region would appear at first sight a farfetched exercise. But, sometimes, unforeseen situations change the perspective of individuals and induce commitment to specific tasks. That is what happened with the authors of this book. The idea of a book on North-East India had its origin in a book-writing workshop, conducted at North-Eastern Hill University, Shillong, in 2005. The workshop, attended among others, by the authors of this book, concluded with a plan to produce a book, on the North-East region of India, to which all the participants were to contribute. For some reason, the plan did not materialise, and consequently, the present authors, encouraged and assisted by the geography faculty of the North-Eastern Hill University (NEHU), undertook to write the book.

We started working on this book in all seriousness in the summer of 2006. During the last 6 years, we visited all the states of North-East India several times and spent considerable time in the field, observing landscape and meeting people, recording our observations and collecting numerical data wherever possible. The field work in North-East, though purposive, often appeared a kind of adventure to explore an unfamiliar terrain. It is not that the region, especially its eastern periphery, is an unknown territory, but some parts of the region are quite isolated and not absolutely risk-free. The towns are a safe zone, but away from the towns one is left to one's own devices. It was quite an adventure to cut across the entire length of mountainous Nagaland or a part of Mizoram or Manipur, all alone in a hired transport. The disturbed conditions, in some of the border states, have a daunting effect on field researchers, but the thrill of reaching certain points or being able to have a visual contact with the landscape of some important areas provides the required propelling energy. The communication with the local people, always through interlocutors who are able to communicate in English, was not always perfect, but carried enough clarity to draw conclusions. In the remote areas, consulting maps in the field, within the sight of local inhabitants, is not without risk. Whenever and wherever we started consulting the map by a roadside, some people arrived from nowhere and started looking at the map from over our shoulders out of curiosity, and finding strangers in their area, started interpreting our field work in their own way. It is best to avoid

consulting maps in the open by the roadside, lest one should be mistaken for a spy. Heights pose another problem. The town with the highest location in the region is Tawang (over 3,000 m ASL). For those not accustomed to this height, a prolonged stay in the region is tiring, unless one stays there long enough to get acclimatised to these heights. Transport is a problem not because hired vehicles are not available but because of the reluctance of transport operators to travel to the areas one would like to visit. It may be emphasised that not all district headquarters in Arunachal Pradesh, Nagaland, Manipur and Mizoram have hotels and one has to depend on the circuit houses run by the State Governments for their own visitors, but are available to bona fide academics and researchers, if informed in advance.

The authors would like to make a mention of the recurring ordeal that every field researcher or an ordinary visitor intending to enter Arunachal Pradesh, Nagaland or Mizoram has to face in getting the entry permit from the representatives of these states, stationed at Guwahati, Shillong or Delhi, to be able to enter these states. Such permission is required under an archaic Bengal Regulation of 1873, under which plains people were not permitted to cross a limit, known as the 'Inner Line' that separated these states from the plain area of Assam. That regulation, to the dismay of many of us, still persists. More frustrating is the fact that the 'Inner Line Permits' are usually valid only for a week and even mention the places one is to visit, thus restricting the movement of the visitors. Deviation from the prescribed route may attract penalty. One has to count oneself lucky to be able to obtain a permission to stay in these states for a fortnight at a stretch. It is like getting a visa for a foreign land. Notwithstanding these minor glitches, the authors have enjoyed travelling through the region. Another difficulty that a field researcher faces in the North-Eastern region of India is the fear of encountering local insurgent groups. There is no state in North-East India which doesn't have a dark corner known for the presence of insurgents. Field scientists are, as such, highly restrained in their choice of areas and time to visit these areas. Access to international borders with China and Myanmar is restricted. Intrastate movement in states other than Assam is not a smooth affair, and one has to be all the time on guard. Our experience of visiting a wayside restaurant in one of the states, where we were advised to hurry up as the area is infested with insurgents, reveals the state of security in the region. Despite all the inconvenience that an individual field researcher faces, contact with the landscape and the people of the region is a rewarding experience, enough to ignore the difficulties of field work undertaken by individuals without any logistic support.

During many of our field trips and visits to the towns and state capitals, we met people of all shades and opinions. They included scholars, university teachers, students and researchers and the faculty and research workers of several other institutes, the government officials and above all the people in the field, belonging to different professions or engaged in different trades. Contact and dialogue with simple peasants and the indigenous people, some of them openly informative while others secretive and clearly indifferent, opened for us the indigenous world of the North-East, without our being able to absorb all that was revealed to us.

The faculty and the research workers of different universities and the research institutes we met, during our visits to the region, wondered at our temerity to undertake

this arduous task of writing a book on a region with a difficult terrain, unsettled political situation and a society not quite at peace with itself. We persisted in the hope of gradually acquiring enough information on the region to be able to weave it in a meaningful text. In our effort we received support from many quarters which we have thankfully mentioned in 'Acknowledgements'. At Pune, our home base, we had the advantage of consulting several libraries that were open to us, the Jayakar Library of Pune University as well as the libraries of several research institutes, including the well-known Gokhale Institute of Politics and Economics and the Deccan College. For several years, it was routine for us to visit these libraries as and when required to fill the gap in our data bank or to acquire any other specific information. Writing the book has been a gradual and prolonged affair. The book took 6 years to complete, after it was conceived and involved considerable field and library work.

Initially, the intent was to write a handy book keeping in view the needs of the university and college students; but as the work progressed, we realised the difficulty of limiting the discussion of the land and people of all the states to a predetermined length. Besides, it had a severe restraining effect on our interpretation of facts. The scope of this book was, therefore, enlarged to make it a reference book as much as a textbook. The book, with no technical jargon, can be read or consulted by anyone interested in North-East India. During the preparation of the manuscript, we occasionally visited the North-East region for lectures and seminars, and that provided us added opportunity to improve our understanding and knowledge of the region. We have adhered to an objective interpretation of the different aspects of society and economy, but interpretations have a way of appearing subjective depending on the perspective and the preconceived notions of the authors. We don't claim immunity from such a bias, but would like the readers to understand that plurality in interpretation is a common feature of the academic world and a conformist view is often unproductive.

This book, it must be understood, doesn't cover each and every aspect of the region. Certain aspects like political developments, border conflicts and strategic situations are not within the purview of this book and the text is confined, as is suggested by the title, to land, people and economy of the region.

We regret our ignorance of the languages of the region, especially Assamese. A knowledge of the language of the people would have better equipped us to interact with them and even promoted a sense of familiarity. Yet, we have honestly tried to understand the people of the North-East, their hopes and aspirations, their despair and sense of frustration and their anger finding expression in occasional revolt. Unfortunately, the society in North-East India, like many other societies, consists of several disparate groups. Each group has its own agenda and a different perspective for social, political and economic development that does not accord with its neighbour, giving rise to mutual distrust and conflict. We only hope that intergroup understanding develops and many of the apparently intractable knotty problems are resolved to the benefit of all the groups. The core problem is the lack of understanding of others' problems and points of view and hence absence of initiative in the right direction. The book refers to some of these problems but avoids sitting on judgement, accusing one group or the other.

This book was planned to be an average length text, but as it turns out, it has taken more space and more pages than expected. The photographs which, we think, are quite expressive and meaningful, while adding to the value to the book, have also added to the length of the volume.

We, the authors, shall feel fully awarded, if the readers find themselves better informed about the region or some aspects of its life and economy, after going through the entire or part of this book.

Pune, Maharashtra, India

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In writing this book, we have received assistance from many institutions and individuals. There number is legion, and it is not possible to thank all of them individually. Yet, it would be sheer ingratitude to forget those who have extended valuable assistance during the course of our work. We would like to clarify that the assistance we received was not in financial terms and confined to goodwill gesture from universities and friends and extended to library facilities, guest house accommodation, and invitation to participation in seminars or deliver some lectures. These could facilitate our travel. The assistance we value greatly is the moral support and the academic input we received from the faculties of different universities of North-East India, especially the North-Eastern Hill University and its geography faculty. There is no institutional funding received or claimed by the authors for writing this book.

Among the institutions, the authors like to express their gratitude to the North-Eastern Hill University, Shillong, for all the support they received. We have lost count of the number of visits to this university, at their expense, as a member of some advisory or selection committee, as visiting professors and as participants in some seminars or for a rest in transit from one of the neighbouring states. In fact, we took it for granted that once we are in Shillong, our friends would take care of us. We are, indeed, grateful to the university. The geography faculty of the university always extended a friendly gesture to us. Prof. A.C. Mohapatra, Prof. Surendra Singh, Prof. B.S. Mipun and Prof. Debendra Nayak gave us unstinted help whenever needed. This extended to our stay on the beautiful campus of the university, transport facility, consultation and reference work and even help in field work. We were first taken to Cherrapunji by Dr. H.J. Syiemlieh and subsequently to some other places. This was one of our first contact with Meghalaya; we fondly remember and thankfully acknowledge his help. While staying on the campus of NEHU, the evening get-togethers, with some of our friends, were real unwinding sessions. These are etched in our memory. There, we met several other distinguished scholars like Prof. T.B. Subba. We must make a special mention of the generous help extended by Prof. Debendra Nayak during our visit to Majuli, the largest river island in the world. His doctoral student Ku Mayuri Das was of immense help. She and her

father Dr. Das, a professor of horticulture, at Assam Agricultural University, Jorhat, organised a visit to a village located around 25 km east of Jorhat city. Mayuri accompanied us to Majuli Island, helped us in communicating with the local residents and enlightened us with her own interpretation of the ecology and culture of the island. During another visit, this time to Garo Hills, especially to a Garo village, Prof. Nayak not only accompanied us but helped us understand the cultural landscape of the area. Prof. P.R. Tiwari of botany department was kind enough to send us the proceedings of the seminar, held in 1984, on 'Resources of North-East India', which we utilised for acquainting ourselves with the biotic resources of the North-Eastern region. We benefitted considerably from other writings of the university faculty, especially from the humanity side, and most crucially from geography. One of us had the benefit of discussion with Prof. Apurba K. Baruah of political science and Prof. P. Nayak of economics departments, both distinguished in their own fields. Prof. Subba's suggestion in finding appropriate reading material on the 'people of the region' was of great help. We are thankful to Dr. P. Nag, former Surveyor General of India, Director, NATMO, and presently the Vice Chancellor of Kashi Vidyapeeth University, Varanasi, for some helpful suggestions, especially on Tripura. While still working as the Director of NATMO, he sent me the much needed maps of the North-East region including some district planning maps, without insisting on prior payment. He also gave me useful suggestions about getting the clearance for the outline map of North-East India, from the Survey of India. To all these professors and others we interacted with, we say, 'Thank you, Sirs, we are really grateful to you'. We must recount an incident, an encounter I had with Prof. Mrinal Miri, a former Vice Chancellor of NEHU, in an evening get-together during the course of a 3-day seminar organised by geography department. I was then organising my ideas about the people of Assam. During the course of our discussion, I opened the topic of 'Miris', the second largest tribe in Assam, and the group from which Prof. Miri hailed. To my pleasant surprise and great appreciation, Prof. Miri gave a short discourse on Miris and their progressive outlook. Could there be a better source of learning than the one I found in him?

Other institutions from the North-East region which extended valuable help include University of Gauhati, Tripura University, Nagaland University, Manipur University, Rajeev Gandhi University of Arunachal Pradesh and Omeo Kumar Das Institute of Social Change and Development. We are especially thankful to Gauhati University. The cordiality and warmth we received at the university guest house and the department of geography of the university make us feel indebted to the university. We must make a special mention of Prof. A.S. Bhagabati, Prof. Barman, Prof. Bimal K. Kar and several others of geography department and Prof. D.C. Goswami of Environment Sciences, who ungrudgingly extended all the help they could. We are grateful to them. At Rajeev Gandhi University of Arunachal Pradesh, we had the privilege of meeting Dr. Sarma, the then Vice Chancellor of the university. Prof. R.C. Joshi, of geography department, guided us about the precautions we should take during our travel in Arunachal Pradesh. He made arrangements for our visit to

Bomdila and Tawang, where Mr. Leki Norbu, another geographer, welcomed us and went out of his way to organise our onward journey to Tawang. We would like to thank Prof. R.C. Joshi and Mr. Norbu for their sincere help. The visit to Nagaland was made meaningful courtesy Dr. Sangyu Yaden at Mokokchung and Dr. Zamir and his associates at Kohima. I greatly appreciate the assistance given by Dr. Yaden who organised visits to a couple of villages and introduced me to a few Ao Naga families whose warm hospitality I would ever cherish. In fact, while living in the university guest house, he was the link between me and the Naga world around me. At Kohima, we were helped by Prof. Zamir and his associates, a charming group of young geographers. They facilitated my visit to Khonoma, a village of Angami Nagas, about 25 km from Kohima, famous for its resistance to British occupation of their territory, in the late nineteenth century. In Manipur, Prof. Deva Singh extended a helping hand and organised a visit to Loktak Lake; though obstructed by some insurgent groups, we could not reach the lake shore.

The officials of the states of Nagaland and Manipur not only were, to my pleasant surprise, willing to provide me the required government publications and data but even offered to help in whatever possible ways they can. In Mizoram, Prof. P.R. Tiwari, professor of geology, was of great help and provided me with some of his publications and a photograph of landslide, reproduced in the present volume. The University of Tripura gave me shelter for a week, and the then Head of the department, Dr. Nibedita Das, was kind to let me consult some of the maps in the department. Dr. Suneel De and the late Dr. Sudeepta De were also helpful in arranging my itinerary. At Guwahati, Prof. A.K. Bhagawati arranged a trip to an Assamese village that was interesting. I am thankful to his doctoral student Dr. Nityanand Deka and his parents who played the role of a very gracious host, invited us to an unforgettable delicious Assamese lunch and made us feel at home during our day long visit to the village.

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University. There is an aura of scholarship around this gentleman; and he and Ms. Taher living in their small yet well-appointed cottage, close to the University campus, present an old-world charm, exuding warmth and hospitality. On a few occasions I visited him, I had some short yet meaningful discussion and benefitted greatly from his perspective. I very thankfully remember him and can never thank him enough. Another gentleman, relatively younger yet well informed, who enlightened me with his views is Shri Samudra Gupta Kashyap, Indian Express Correspondent at Guwahati, possessing a wide sweep of knowledge of North-East India. I relished each piece he wrote on the region ranging from 'Small Tea Planters' to 'Brahmaputra Floods'. He also helped us in securing some photographs of 'Brahmaputra in Flood'. His gentle approach and enlightened views impressed us. We thank him for not only extending help but also a warm welcome one of us received at his residence by the husband–wife duo. Both Shri and Shrimati Kashyap have been students of English literature, the former taking to journalism and the latter taking a college teaching assignment after securing a Ph.D. in literature. Prof. G. Bahrenberg of Bremen University, Germany, accompanied us on our field work in Brahmaputra valley, Majuli Island and Garo Hills. It was a great assurance having him and Prof. D.K. Nayak of NEHU in our group, as both of them, with their field experience, helped us interpret the landscape correctly. To Prof. Bahrenberg we say, we shall always remember our journey across Brahmaputra to visit Majuli Island, where we subsisted on fat 'Bhim bananas' a local variety of banana with seeds, and our visit to a village located about 30 km from Jorhat. We learnt quite a bit from your curiosity in the field and hope you also benefitted from your visit to Brahmaputra valley and Garo Hills.

At our home base at Pune, near Mumbai (erstwhile Bombay), at the western end of the Indian subcontinent, the three libraries, which we perpetually combed for relevant material for the book, included Jaykar Library of University of Pune, Deccan College Library and Prof. D.R. Gadgil Library of Gokhale Institute of Economics and Politics, Pune. At Gokhale Institute, Prof. Maharatna, specialising in Tribal Demography, showed special interest in my work and encouraged me constantly. Our former colleagues and students, at the department of geography, University of Pune, were a constant source of support encouragement to us. Prof. S.R. Jog, Prof. Jayamala Diddee, Prof. V.S. Datye and Prof. V.S. Kale, all of them, my former students and colleagues in the department, offered moral support and extended help whenever asked for. The authors have a special word of appreciation and gratitude for Prof. S.R. Jog. He accompanied K.R. Dikshit, one of the authors, during the field work in Arunachal Pradesh, a difficult terrain, for over a fortnight. Crossing the river Brahmaputra in a small mechanised craft was an adventure, and staying at odd places became a temporary hobby. An incident that merits recounting is the failure of Dikshit's camera, leaving Jog alone to take photographs, many of which are reproduced in this volume. Prof. Jog also helped us in designing and preparing maps for the book and kept in constant touch with the progress of the book, offering help if and when required. Prof. Veena Joshi, of Pune University, went

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1. Survey of India, for certifying the outline map of North-East India
2. Geological Society of India, Bangalore, for permission to reproduce the geological cross section (Fig. 9) from 'Geology of Assam' by A.B. Das Gupta and A.K. Biswas (2000)
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It is likely that we have not acknowledged the help received from some individuals and institutions during the course of our work. For all such omissions, we express regrets and beg their forgiveness. We genuinely thank all those institutions and individuals who have helped us directly or indirectly in the writing of this book.

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Chapter 1
Introduction

Abstract The present volume embarks on an exploration of North-East India, a region lying on the crossroads between India and Southeast Asia. As the title of the book suggests, it discusses the land of the region with all its physical attributes, the people of the region with their distribution, ethnic and cultural traits and the economy of the region in a historical as well contemporary context. Divided into 20 chapters – some long, some short and some unseemly long – the text starts with giving the readers a glimpse of the region's past and ends with evaluating the socio-economic achievements of the region. Since space and distribution are involved, the volume carries many illustrations, including maps and photographs that offer a visual spot contact with the region.

The part of the book titled 'The Land' looks at the structural base of the area, in a geological sense, the physical relief, the climate and the vegetation cover with a short note on the region's biodiversity. The readers may find in the appendix a list of wildlife sanctuaries and national parks, meant to save the precious natural heritage of the region. Subjected as the region is to frequent floods and seismic tremors, there is a brief analytical account of natural hazards. The indigenous people of the North-East region who account for 27 % of its population form the most tangled, yet most interesting, section of the book, and the important among them are discussed in brief showing their distribution on maps. Population and migration have claimed a large space in the book in view of perpetual problem of illegal immigration in the region, particularly Assam. Agriculture, industrial development and the importance of transport, in the region, have been evaluated objectively. The book concludes with an evaluation of the socio-economic achievements of the region and an epilogue, which broadly records the reflections of the authors on the region. The book is intended for scholars as well as others interested in the region. It is not a research monograph but a comprehensive text that provides information on different aspects of the region and different facets of the social life of its people.

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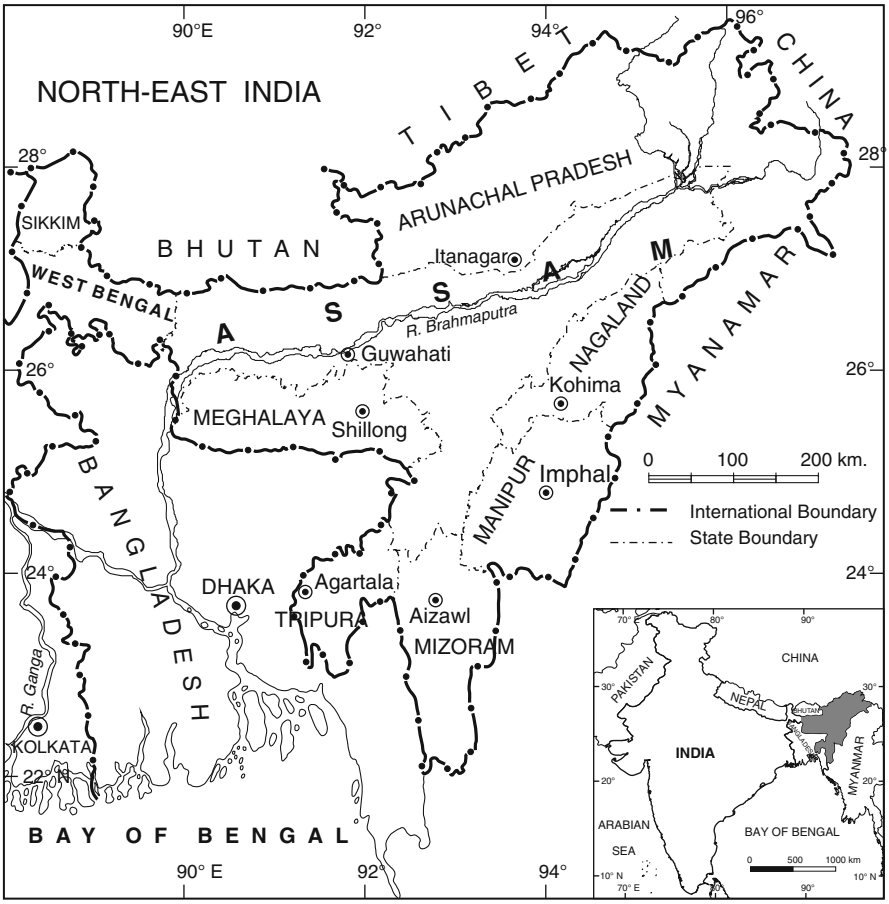

Fig. 1.1 Outline map of North-East India, with constituent states and their capitals

The present volume, as the title suggests, discusses the land, the people and the economy of North-East India, a constellation of seven states, (Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland and Tripura). Lying between 22° and 29°25′ N. latitude and 89°42′ and 97°25′ E. longitude, the region is spread over an area of 255,083 km^2 and has a population of over 45,000,000 (forty-five million in 2011). Over two-thirds of the population live in Assam, the principal, the most ancient and the most populous state of the region. The region accounts for 7.75 % of the area and 3.7 % of the population of India (Fig. 1.1).

North-East India, known for centuries as Assam, the principal constituent unit of the region, was for long perceived as the land of magic and incantation, a by-product of Tantric Buddhism. Very early in history, it was known as Pragjyotish. Subsequently

around the sixth century AD, it came to be known as Kamarupa before it finally attained the present name of Assam in the fourteenth century. The fame of Assam's royalty, after Bhaskarvarman, the most illustrious king of Varman dynasty during the sixth century, and the lore of its people had hardly any echo beyond the neighbouring Bengal. The mighty Brahmaputra and the tropical dense forests, teeming with wildlife, rendered Assam least attractive and at the same time most impregnable. The advent of British rule opened the region and brought it closer to other parts of India and the world. The discovery of tea in Assam; the growth of tea plantations, owned largely by British companies; and the tea export from the region to the Western capitals made Assam famous for its tea. In fact, Assam tea became the most valued beverage in the Western world and Assam tea companies the most profitable ventures, and Assam came to be known by its trademark product 'the Assam tea'.

By introducing steam navigation on Brahmaputra and facilitating communication between Assam and Bengal and laying down railways to provide access to sea, the British rule brought Assam closer to the rest of India. From Assam as the focal point, the British expanded in the eastern frontier regions, enlarging the area of Assam province that included many tribal territories. Thus, Assam, as a British province in 1947, had a much larger area than what it had in the early nineteenth century when the British wrested it from the ruling Ahoms.

After 1947, the year of India's independence, several smaller states, notably Nagaland, Meghalaya and Mizoram were carved out of the monolithic province of Assam. In addition, two princely states, viz. Manipur and Tripura, were merged into Indian Union and attained the status of full-fledged states. The North-East Frontier Area (NEFA), the land between the Himalayan watershed and the Brahmaputra, was also given the status of a state. Thus, seven states, including Assam, emerged in the region, popularly known as seven sisters. Together, these states constitute what is administratively recognised as North-East region of India. Though for the purpose of giving grants and other material assistance, the Government of India has clubbed Sikkim with other North-Eastern state of states, the Sikkim is not contiguous to any of the above states and has no close economic or cultural link with other states of the region. Hemmed in by Bhutan, West Bengal, Nepal and Tibet, its eastern boundary is at least 150 km west of Assam's border. Sikkim is, therefore, omitted from the ambit of North-East India.

Locationally, North-East India represents a transition between South and Southeast Asia, on the one hand, and between the eastern extremity of the Indo-Aryan linguistic and racial domain that extends across North India and the Mongoloid domain of East and Southeast Asia, on the other hand. Equally, the region represents the crossroads of Indo-Malayan, Indo-Chinese, Sino-Himalayan and East Asiatic flora. Besides, the Eastern Himalayas and the peripheral eastern mountains are labelled as one of the two biodiversity hotspots in India. Indeed, standing between South Asia and Southeast Asia, the region shares the characteristic features of both these regions.

The land of North-East India is a nature's museum. With 'blue hills and red rivers', the forest clad mountains rising in stages to the Great Himalaya heights, the

evergreen and semi-evergreen forests with a very high level of biodiversity, interspersed with clearings occupied by tribal habitats, are a plant explorer's delight. Added to this are the lush green tea plantations, soothing to an observer, where the British planters with their exclusive 'Planters Clubs', tennis courts and evening parties, with a host of native attendants in tow, ruled the roost. A visit to a large tea estate plantation reminds one of the lifestyle of tea planters during the British Raj. Abounding in wildlife, large mammals, like tigers and panthers, elephants and rhinos, with a large variety of reptiles, the region is home to some of the rare animals like the one-horned rhino. India's North-East is especially known for a large range of orchids, some of them very rare.

This land is largely inhabited by two groups of people: the indigenous people of the Mongoloid stock who, largely confined to the peripheral mountainous region, constitute about a quarter (27 %) of the total population of the region and the Indo-Aryan group living in the two alluvial valleys of Brahmaputra and Barak. While the indigenous people, distributed over 200 tribes, speak a Tibeto-Burman dialect, specific to each tribe, the people of the plains have a well-developed language, the Assamese, with its own grammar, and a literature, comparable to the best of any other Indo-Aryan group of languages. In fact, the state of Assam, the focal state of the region, occupying the Brahmaputra valley, with a population of over 30 million (31,169,272 in 2011), is the most developed part of the region. For centuries, it has experienced successive waves of immigration and the cultural impulses from the Gangetic valley and developed a society, which in its language, religious beliefs, family and social relationships and cultural practices is akin to the one in the North Indian plains. There has certainly been a cross-fertilisation of ideas and cultures, and in the process a society with a relatively syncretic culture has emerged.

A majority of the indigenous people, especially those in the peripheral mountainous areas, have embraced Christianity and the indigenous tribal culture is replaced with one based on Christian morality. The emergence of some of the states, viz., Nagaland, Mizoram and Meghalaya, was the fulfilment of the aspirations of these groups to have a state of their own and manage their own affairs.

1.1 A Glimpse of Early Writings on the Region

Such a region as India's North-East, one could imagine, may not have attracted any serious research or writing on the region. This is not so. Besides the accounts contained in the chronicles of different ruling dynasties, and the writings of some Muslim historians who accompanied the invading armies, an abiding interest in understanding the region, its people and resources, was shown by the East India Company and its civil servants. North-East India also exercised great fascination on researchers of a different breed, notably those interested in anthropology and society. The pages of the 'Journal of Asiatic Society of Bengal', after it was started

in 1785, are replete with reports and descriptions of all kinds. These related to historic ruins, inscriptions, some unique cultural practices or any other event that appeared unique and threw some light on the history, life and culture of the people. As early as 1804, when the East India Company was nowhere in Assam, Dr John Peter Wade (1805) wrote *Geographical Sketches of Assam* published in the Asiatic Annual Register. A far more comprehensive work, one of its kind, was William Robinson's book *A Descriptive Account of Assam, with a sketch of the Local Geography, and a Concise History of the Tea Plant of Assam: To Which Is Added a Short Account of Neighbouring Tribes, Exhibiting Their History, Manners, and Customs* published in 1841. Almost on the eve of the British dislodging the Ahoms and taking control of Assam's administration, they deputed Capt. Bedford and Lts Wilcox and Burlton to explore the Brahmaputra toward its source in 1825. Burlton surveyed the Brahmaputra as far as Sadiya, Bedford journeyed up the rivers Dihong and Dibong until he was stopped by wild frontier tribes and Wilcox made one journey beyond the frontier up the Brahmaputra and in another penetrated to the banks of Irrawaddy. The results of many of these surveys were combined by Capt. Pemberton in 1835 and Wilcox (1832).

The British *interest* in North-East India was phenomenal and stemmed not only from the exigency of knowing thoroughly the territory; they ruled, or were to rule. The two unique features of the North-East especially attracted them: one was the large population of indigenous tribes which evoked their curiosity and interest, and the other was the biodiversity of the region that attracted plant explorers like Francis Kingdon Ward. Ward visited Assam not once but several times, starting from 1926 and ending in 1950. As a plant explorer, he spent months together in the inhospitable jungles of Assam and Arunachal Pradesh. His first visit to East Tibet was in 1926, and his last to Assam was in 1950. In fact, he was in Lohit valley when the great earthquake of 1950 occurred in Assam. The results of his exploration are published in many books and research papers. The most quoted of his books in relation to Assam are *The Riddle of the Tsangpo Gorges* (1926), *Assam Adventure* (1941) and the *Plant Hunter in Manipur* (1952). Another great earth scientist, a geologist, who visited Assam in the mid-nineteenth century, was Sir Thomas Oldham. Oldham (1859), the first Head of the Geological Survey of India, made extensive traverses of Khasi Hills in 1851 and published his account under the title *On the Geological Structure of Parts of the Khasi Hills with Observations on Meteorology and Ethnology of That District* in 1854. Oldham stayed at Cherrapunji for five rainy months and recorded the rainfall with a pluviometer, besides recording temperature, pressure and humidity of the station.

Similarly, E. T. Dalton's *Descriptive Ethnology of Bengal* (1872), published by the Asiatic Society of Bengal, is an early standard publication on the tribes of the North-Eastern India. To take it further, Mackenzie A. (1884) wrote a *History of Relations of the Government with the Hill Tribes of North-East Frontier of Bengal*. The first 50 years of the twentieth century saw a flurry of publications by the officials and the civil servants of the British Government. The most significant of all the publications was the first ever written *History of Assam*

by Alexander E. Gait (1906), a text that is valuable even today. Shakespear, L.W. picked up the thread from Mackenzie, took the studies of frontiers further and wrote *A History of Upper Assam, Upper Burma and North-East Frontiers* in 1914. The last in the series of the history of frontiers was the *History of the Frontier Areas Bordering on Assam from 1883 to 1941* written by Sir Robert Reid (1942). This was the last of the history works by the officials of the British Government. Added to these, and not less significant, are the research monographs on individual tribes. In this context the contributions of J. H. Hutton (1921a, b), J. P. Mills and von Fürer-Haimendorf could be mentioned. The first two were working as Deputy Commissioner in Naga Hills district, but von Fürer-Haimendorf arrived in Nagaland as an anthropologist. In this category are included the published studies of Angami and Sema Nagas by J. H. Hutton in 1921; the study of Ao, Rengma and Lotha Nagas by Mills (1922, 1926, 1937); and the study of Konyaks published under the title *The Naked Nagas* by Fürer-Haimendorf (1939). This is just to suggest that North-East India figured quite prominently in the British scheme of things and the knowledge of this region was very vital to them.

The departure of the British from India ushered in the era of expansion of education in India, and North-East India saw the establishment of a number of colleges, universities and research institutions. During the last 60 years, scholars from a variety of fields in the North-East are not only engaged in researches relating to different aspects of nature, land and society but have published works of merit in arts, science and other aspects of the region. A large number of university teachers are involved in editing and writing books on themes ranging from the history, culture and civilisation of Assam to political instability and insurgencies. Most of these publications are thematic, discussing a single aspect in the complex regional problems. Economy, security, history, social welfare, folklore and literature – all form interesting areas of publication. Some of these publications are referred to in the present text.

1.2 Organisation of the Text and Content of the Book

1.2.1 Organisation of the Present Text

The present volume is a tad different in that it carries a holistic perspective on the land, people and economy of the region. It doesn't, nor was there ever an intention to, drift into the unfamiliar terrain of literature or regional and local politics. Depending on the demand of each chapter, the authors have discussed the contemporary physical, cultural and economic landscapes of the region without adhering to any pre-established theoretical framework. Similarly, while discussing the people, their spatial distribution is emphasised together with the economic activities, mode of living and some of their principal cultural traits.

The text of the book is divided into five parts, the historical outline, the land, the people, the economy and the future, each containing one or several chapters. Thus, there are 20 chapters, some short and some long. The themes, as signified by each chapter, are discussed in a contemporary frame, without sacrificing the historical perspective, based on the conviction that the cultural landscapes carry the imprint of their history as much as the influence of their physical and social environment.

The opening chapter 'North-East India Through the Ages' is intended to establish a continuity with the past and gives a glimpse of what has happened in the history of the region. Similarly, the book closes with an 'Epilogue' where the authors record their impression of the region, keeping in mind its past and the contemporary situation, and project their imagination about the region's future. Most of the chapters in the book have a moderate length; some are quite short, but the chapter – 'People of North-East India'– is inordinately long, long enough to test the patience of the readers. The authors, despite the awareness of this fact, could not prune its length. A discussion of the people of the North-East region of India involves taking stock of roughly two hundred tribes including subtribes. Even limiting the discussion of tribes to those having a population of over 20,000 doesn't simplify things. There are over 70 tribes with a population over 20,000 population. Besides, there are regional contexts and concerns, which cannot be sacrificed. A greater part of this chapter is devoted to the 'people of Assam'. The importance given to Assam signifies the crucial role that the state and its people play in the affairs of the entire region. Assam is the socio-economic and cultural core of the region. It acts as a balancing lever. It has, for long, experienced the interaction between the tribal and the nontribal people, learning from each other, and absorbing from each other elements of culture that suit them. Many of the sociocultural elements of the Assamese society are briefly recounted to strengthen our understanding of its structure and unique features.

The number of illustrations is kept to the minimum, keeping in view the length of the book and the wide readership that the book may attract. This may include university students and teachers, researchers and scholars in several disciplines, administrators and the general public. All these groups may not show as much enthusiasm for maps as perhaps some earth scientists, especially geographers.

1.2.2 The Content of the Book

Besides the three principal parts, the land, the people and the economy, there are some introductory chapters which acquaint the readers with the region's past. The book opens with a chapter titled *North-East India Through the Ages.* Similarly, to provide a background to the part on 'the People', a chapter entitled *Early Colonisation* is given as a prelude to enable the readers to appreciate the enormous variety in nomenclature and the present distribution of different groups. A brief

justification is given in the beginning of each of these chapters. A brief introduction to these chapters is given here.

To establish continuity with the past, the book begins with the region's historical antecedents and the changes the region has experienced through the ages, in the opening chapter, 'North-East India Through the Ages'. The unrecorded early history of Assam, based essentially on inscriptions, is symbolic of early eastward propagation of Indo-Aryan culture in Brahmaputra valley, from the Gangetic plain. A succession of royal dynasties, ruling before the thirteenth century, has left its imprint on the region in the form of temple ruins and a number of copper plates carrying grants and royal charters, at several places. The early dynasties, exemplified by Varman dynasty of which Bhaskarvarman was the most illustrious king, had adopted an Aryan culture and were worshippers of Shiva or Vishnu, the Hindu deities. Subsequent events of invasion, occupation of territories, propagation of cultures and the development of economies are recorded and better known through recorded history.

The history of Assam is replete with several short- and long-term occupations of the land by invaders, from the east as well as the west. The Ahoms, who ruled Assam for 600 years and after whom Assam is named, invaded and occupied the Brahmaputra valley in the early thirteenth century. They arrived from Shan plateau of Burma. For over four centuries (fourteenth to eighteenth), the ruling dynasties of Bengal, as much the generals of Delhi emperors, invaded the Brahmaputra valley time and again, established their rule for awhile and finally retreated. While much of western Assam remained turbulent, having witnessed a series of invasion and short tenure of foreign rule, the eastern part ruled by the Ahoms remained more or less stable, till they were dislodged by the British in the beginning of the nineteenth century. The principal dynasties which ruled Assam before the imposition of the British rule included the Ahoms ruling in eastern Assam; the Koches ruling for 200 years, from Cooch Bihar on Bengal border; and the Kacharis who ruled over the Dhansiri valley and the Cachar region of Assam. The history of the British rule and the events that took place during that period are well recorded. During the last 65 years, the period of an independent democratic India, North-East India has witnessed far too many political events to be included in the present text. The aspirations of many indigenous tribal groups, to have a state of their own, found expression in the creation of the existing seven states that constitute North-East India.

Like 'North-East India Through the Ages', another chapter, *Early Colonisation,* was considered necessary to understand the sequence of early occupation. Recent archaeological works by some of the academics, working in the region, have deciphered the imprint of early man in the region from the Neolithic period. The earliest immigrants and an understanding of their diffusion would help establishing a link between the successive waves of immigrants and the present social and ethnic groups in the region. A linguistic similarity has been the most significant criterion in understanding their spread, despite the distance and change in their faith and manner of living. In the closing pages of the book, there is yet another chapter,

Socio-economic Assessment of the Region, which besides being unconventional appears judgemental, which it is not. It is more or less a performance indicator on a scale of progress, as seen in India or in other states of the region. This, the authors believe, gives an idea of the pace of development and the extent of achievement or the lack of it. After all, one would always like to know the state of welfare of the people. The objective of this chapter is to provide some hints on the socio-economic standing of the region.

All other chapters are factual, sometimes with some simplified technical details, as in the case of *Geological Structure* that provides the base for all the subaerial and diastrophic forces to work on, to fashion a physical landscape. A round up of what to find in the book follows.

1.2.3 The Land

The structural base of the region is formed of two contrasting sets of rocks. Leaving the Arunachal Himalayas and the Meghalaya plateau which have crystalline rocks, much of the North-East India is formed of the Tertiary rocks, ranging in age from 2 to 60 million years. Even the alluvial valleys of Brahmaputra and Barak rest over a thick pile of Tertiary sediments, deposited on the crystalline basement. The movement of Indian plate to the north and North-East, underthrusting the Tibetan and the Burmese plates, has subjected the region to a variety of compressional or tensional movements, throwing the region into a number of folds and thrusts and, thus, bringing into existence mountain ranges and synclinal valleys. The eastern peripheral mountainous system of the region, covering the states of Nagaland, Manipur and Mizoram, and a series of north–south trending hills of Tripura have resulted from such movements. The Arunachal Himalayas are the eastern continuation of the great Himalaya range, where underthrusting of the Indian plate started about 50 million years ago during early Tertiary and still continues, giving rise to the mighty Himalayas. The median zone between the two major thrusts, the Naga–Disang thrust on the east and southeast and the main boundary thrust (MBT) on the outer limit of the Himalayas, was occupied by a sediment-filled Brahmaputra valley.

What appears today as the relief of the region is an expression of the lithology and structure of the area, subjected to tectonic movements, triggered by the collision of the continental plates. Subsequently or even concurrently, the subaerial forces have worked to create the present relief.

The physical landscape of the region is best described by comparing the region to an amphitheatre, in which the two east–west flowing main rivers, the Brahmaputra and Barak, are surrounded, and overlooked, by mountains and plateaus from the three sides, north, east and south. There is, besides, an alternate arrangement of four east–west aligned subparallel physical units: the 150–200 km wide high Himalayan zone in the north, followed by a 70 km wide Brahmaputra valley in the south, to be buttressed again in the south by Karbi-Anglong plateau and the Barail range and

finally the valley of east–west flowing river Barak. The Himalayas, rising north of the Brahmaputra plain, in a series of west–east aligned ranges, and forming the northern boundary of the region, attain a height of 7,000 m ASL. The Himalayan ranges have the most vital influence on the life and economy of the region. They not only cause heavy orographic rain but are the source of all the northern tributaries of Brahmaputra, which, running down on steep slopes, create a huge potential for the generation of hydroelectric power. The north–south trending Indo-Burma orographic chain, a reflection of the subduction of the Indian plate under the Burmese plate, forms the eastern boundary of the region and extends all the way south till the tip of Mizoram and beyond. The height of the region varies from 50 m ASL in lower Brahmaputra region to the Himalayan heights reaching 7,000 m ASL.

The region lying between 22° and 29°30′ N, though not within the Tropics, enjoys a climate, almost similar to the one within the tropics. Ranging in altitude between 50 and 100 m ASL and enjoying monsoon rains varying in amount between 1,800 and 2,500 mm in the plains to 2,500–>10,000 mm in the hills, the region is the rainiest part of India, with high temperatures in summer and a high relative humidity during the monsoons. This climatic environment has generated a kind of vegetation that ranges from tropical evergreen at lower levels to conifers in the higher Himalayan zone. The physical landscape of the region can be summarised by the two linear plains, one developed by the Brahmaputra and the other by the river Barak, surrounded by a girdle of forest clad mountains which form the habitat of a large variety of wildlife that includes, among others, elephants, tigers and one-horned rhino and all kinds of aquatic and avian fauna. Besides providing a glimpse of some salient facts about the biodiversity in the region, which claims the status a biological hotspot, the measures initiated to preserve the biodiversity and protect wildlife are discussed in a short section on region's biodiversity.

1.2.4 The People

The part devoted to the *People of North-East India* is the longest. As mentioned in subsequent paragraphs, the region has a large number of complex social and ethnic groups. Illustrating this complexity has taken large space. Despite the length of this chapter, the authors are not sure if they have succeeded in providing some idea of the people of the region.

This unique theatre of nature, once in its pristine glory, has been gradually colonised and transformed into a cultural landscape, a mosaic of traditional and modern cultures, juxtaposed to each other. The earliest colonisers of this land were the Neolithic people, in all probability of Mongoloid stock. In fact, the Mongoloid people were firmly established in this region, at least several thousand years ago. A culture of better agricultural methods, a grammatically refined literary language and a better organisation of territory, people and administration arrived in the valley from the Gangetic plain, later. This region also witnessed an early migration of

people and some ruling dynasties which transplanted an Indo-Aryan cultural in the valley. Successive waves of immigration and invasion produced a mass of humanity in which multiple racial and ethnic stocks were fused to produce an Assamese language, an Assamese culture and an Assamese cultural landscape.

The contemporary society of the North-East region has two major strands of ethnicity and culture. One is the Mongoloid stock, largely represented by the tribal population of the region, and the other is the dominant Indo-Aryan group of people, the Assamese, the Bengalis and myriad other immigrant Indo-Aryan groups. Even today, these tribal groups maintain their distinct identity, and the larger among them assert their distinctiveness. In the first group are included the tribes like Nagas, Mizos and the Khasis. While the tribal groups, regardless of numerical strength, have retained their cultural moorings, speaking their own dialects and practising their own rituals, the people of the plains have adopted a regional identity and are collectively known as Assamese, signifying a common bond of the land they inhabit and the language they speak.

The region has one of the largest concentrations of indigenous people who form around 27 % of its total population. Distributed over 200 odd tribal communities, none of them has a population of over two million. The three large tribal communities in the region are represented by the Nagas, the Khasis and the Mizos. Each of these has succeeded in carving out a state for itself, out of the parent state of Assam. The North-East region with a population of 45 million, in 2011, is divided into multiple sociocultural blocks, represented by some major tribal communities and Assam, the principal state of the region, with roughly 30 % of the area and over two-thirds of the total population of the region.

Assam is the principal state of the North-East with a millennium-old sociocultural tradition and an economy larger and more balanced than the rest. The principal tea-producing state of the region and rich in minerals like petroleum, Assam has a streamlined administration. The population of Assam consists largely of Hindus and Muslims, unlike Nagaland, Mizoram and Meghalaya where a large majority has embraced Christianity.

The North-East was once the most sparsely populated part of India. The population of the region has grown from around ten million in 1901 to 45 million in 2011, with a corresponding increase in the density of population from less than 40 persons per km^2 in 1901 to 147 in 2011. Assam, largely occupying Brahmaputra valley, and unlike other states of the North-East, has a much higher density of population that reaches over 300 persons per km^2, comparable to an overall density of India. There are, however, still large chunks of territory in the region, as Arunachal Pradesh, where the population density is around 15 persons per km^2. The region is not highly urbanised and Guwahati, the capital of Assam, is the only million-city in the region. A very important fact about the population of North-East India is the huge immigration of people, much of it illegal, from the neighbouring countries. A serious consequence of India's division in 1947 into two countries, India and Pakistan, is the uninterrupted illegal immigration from the neighbouring countries, principally East Pakistan, now Bangladesh. In fact, the single important element disturbing the

harmonious existence of Assamese society is the fear of immigration and the immigrants who increasingly influence the politics and the economy of the state. The border clashes, between the indigenous people and the immigrants, don't appear to be one odd incident and have turned into periodic disturbances. The possibility of immigration of people with an alien culture is a perpetual threat to the Assamese society. So immense has been the immigration, especially after 1971, that Assam revolted against the Union Government, accusing it not only of its failure to check this immigration but even of the latter's connivance at the illegal entry of Bangladeshis in Assam. Another consequence of illegal immigration and the perceived indifference of the Central Government is the emergence of a number of insurgent groups who advocate secession from India. The insurgency in the North-East of India, a recurring phenomenon, has done tremendous harm to the region and its overall development.

1.2.5 The Economy

Agriculture, the main occupation of the people, suffers from the inadequacy of cultivable land, though Assam with its two main alluvial plains, the Brahmaputra and the Barak, has more than one-third of its land under cultivation. The North-East is agriculturally a rice domain. Rice is the most important crop and staple food of the people. The hilly areas, largely inhabited by indigenous tribes, are still subjected to 'slash and burn' type of shifting cultivation, a practice that has damaging impact on the plant resources of the region. Its intensity, in recent years, has declined, and horticulture as an option is being promoted. Introduction of rubber as a commercial crop in Tripura and some other areas is proving a popular alternative, besides horticulture.

The discovery of petroleum and tea and their economic exploitation and the introduction of railways boosted the economic development of the region in the beginning of the last century. But after the initial take off, that remained confined to expanding tea plantation and exploiting petroleum and coal, no industrialisation that could make substantial difference to the economy and employment opportunity in the region took place. Assam tea and petroleum were the most lucrative commodities in the British trade, and the province had the pride of a place in British commercial interests. The state was industrially undeveloped during the period of British rule and remained so for decades, even as a state of democratic India. Recent efforts of the state, supported by the Union Government, have produced some results, and industrialisation is likely to be accelerated.

The economy of the region has expanded in recent years. A separate ministry for the development of the North-East region (DONER) is established at the level of the Union Government, and around 10 % of the Union budget is meant to be spent for the development project of the region. The resources that are awaiting development include, among other things, a huge water power potential in the region.

It is estimated that Arunachal rivers have the potential to generate 50, 000 MW of power, that is, half the potential of the entire country. A terrain, quite suitable for horticulture, remains unutilised. So far, the public sector enterprises have concentrated on the exploration and exploitation of oil and gas and the refining of petroleum. The infrastructural development to connect and bring the most inaccessible areas – and there are many – closer to the centres of population and economic activities is under way.

The book closes with an 'Epilogue'. This is our reflection on the future of the region which we perceive rather optimistically to be bright. We genuinely foresee the emergence of a vibrant North-East India, in a span of a few decades, after its economic potentials are realised and social harmony returns to the region.

1.2.6 About the Maps

The North-East India, the outline of which, as given in this chapter, is authorised and approved by the Survey of India. While authorising the use of this outline map, Survey of India requires the following footnotes to be written in each map. Since this is impractical, they suggested to us to record these footnotes in the initial pages of the book. These footnotes, related to the outline map of North-East India (as given in this chapter), are as follows: (1) @Government of India, copyright 2013; (2) the responsibility for the correctness of the internal details rests with the author; (3) the territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate baseline; (4) the interstate boundaries among Arunachal Pradesh, Assam and Meghalaya shown on this map are as interpreted from the 'North-Eastern Areas (Reorganisation) Act. 1971' but have yet to be verified; (5) the external boundaries and coastlines of India agree with the record/master copy certified by the Survey of India; and (6) the spellings of the names in this map have been taken from various sources. The authors take complete responsibility to adhere to these instructions.

The foregoing paragraphs, we think, are enough of an introduction to the book and should give an idea about what the book is about. To our readers, we would like to say that North-East India is a very fascinating region, suffused with natural beauty, but riddled with disputes and controversies. Writing about the regions, as has been our experience, is a cautious enterprise if one wants to keep away from any controversy. Yet, the possibility of being accused of bias is always there. We, on our part, have tried to keep away from being judgemental unless we are convinced of the facts and their interpretation offered. Yet, there may have crept in the book some sentences or statements which may appear ambiguous or convey meanings that don't conform to the views of the some readers. In a large volume of this size, the possibility of some repetitions cannot be ruled out, but these have to be seen contextually. We have acknowledged the sources of data, information or

interpretation that are used in the text as a support base for discussion. Omissions and mistakes, if any, are inadvertent and would be corrected at the earliest available opportunity.

We value greatly opinions of the readers and particularly of those who are well acquainted with India's North-East. To that end, comments are welcome from all quarters and especially from the scholars of North-East India. The authors shall consider the objective of writing this book fully realised, if the students, teachers and researchers and other scholars find the text worth consulting and reading and the book finds a place on the shelves of most of the libraries in the country, especially in North-East India (Fig. 1.2).

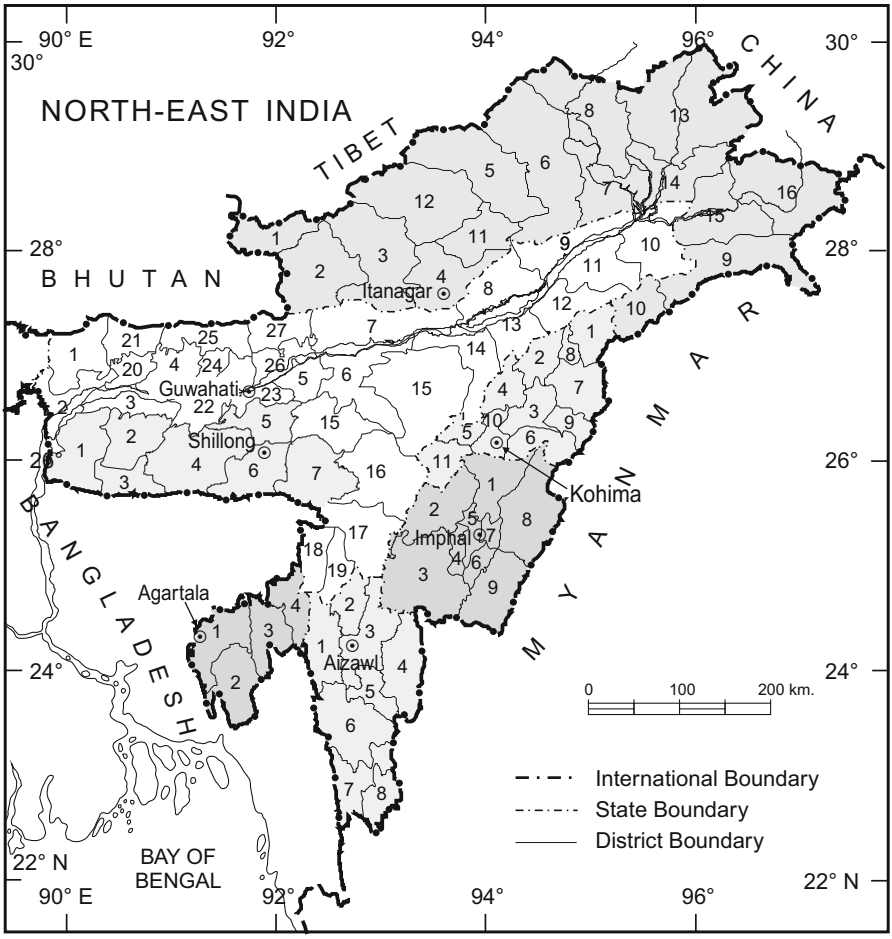

Fig. 1.2 North-East India: states and districts. The numbers, appearing in the map, conform to the numbers assigned to the districts in the appended list

Arunachal Pradesh
1. Tawang
2. West Kameng
3. Balemu (East Kameng)
4. Papum Pare
5. Upper Subansiri
6. West Siang
7. East Siang
8. Upper Siang
9. Changlang
10. Tirap
11. Lower Subansiri
12. Kurung Kumey
13. Dibang Valley
14. Lower Dibang Valley
15. Lohit
16. Anjaw

Assam
1. Kokrajhar
2. Dhubri
3. Goalpara
4. Barpeta
5. Morigaon
6. Nagaon
7. Sonitpur
8. Lakhimpur
9. Dhemaji
10. Tinsukia
11. Dibrugarh
12. Sivasagar
13. Jorhat
14. Golaghat
15. Karbi-Anglong
16. Dima Hasao
17. Cachar
18. Karimganj
19. Hailakandi
20. Bongaigaon
21. Chirang
22. Kamrup
23. Kamrup Metropolitan
24. Nalbari
25. Baksa
26. Darrang
27. Udalguri

Manipur
1. Senapati
2. Tamenglong
3. Churachandpur
4. Bishnupur
5. Thoubal
6. Imphal West
7. Imphal East
8. Ukhrul
9. Chandel

Meghalaya
1. West Garo Hills
2. East Garo Hill
3. South Garo Hills
4. West Khasi Hills
5. Ri Bhoi
6. East Khasi Hills
7. Jaintia Hills

Mizoram
1. Mamit
2. Kolasib
3. Aizawl
4. Champhai
5. Serchip
6. Lunglei
7. Lawngtlai
8. Saiha

Nagaland
1. Mon
2. Mokokchung
3. Zunheboto
4. Wokha
5. Dimapur
6. Phek
7. Tuensang
8. Longleng
9. Kiphire
10. Kohima
11. Peren

Tripura
1. West Tripura
2. South Tripura
3. Dhalai
4. North Tripura

References

Chandramouli C, Census of India (2011) Administrative Atlas, Office of the Registrar General and Census Commissioner, Ministry of Home Affairs, Govt. of India, India. http://www.censusindia.gov.in/2011census/maps/administrative_maps/Final%20Atlas%20India%202011.pdf

Dalton ET (1872) Descriptive ethnology of Bengal. Asiatic Society of Bengal Press, Calcutta, (1973) Reprinted by Cosmo Publication, Delhi

Gait EA (1906) A history of Assam. Thacker Spink, Calcutta, reprinted (2006) LBS, Guwahati

Hutton JH (1921a) The Angami Nagas with some notes on neighbouring tribes. Macmillan & Co., London, reprinted OUP

Hutton JH (1921b) The Sema Nagas. Macmillan, London

Kingdon-Ward F (1926) The riddle of the Tsangpo gorges. E. Arnold, London

Kingdon-Ward F (1941) Assam adventure. Jonathan Cape, London

Kingdon-Ward F (1952) Plant hunter in Manipur. Jonathan Cape, London

Mackenzie A (1884) History of relations of the Government with the hill tribes of North-East frontier of Bengal. Home Department Press, Calcutta, (2005) reprint as 'North-East frontiers of India'. Mittal Publications, New Delhi

Mills JP (1922) The Lotha Nagas. Macmillan, London, reprinted 1980, Directorate of Art & Culture, Government of Nagaland, Kohima

Mills JP (1926) The Ao Nagas. Macmillan, London, reprinted 2003, Nagaland Directorate of Art & Culture

Mills JP (1937) The Rengma Nagas. Macmillan, London, reprinted 1982, Nagaland Directorate of Art & Culture

Oldham T (1859) On the geological structure of a portion of the Khasi Hills. Mem GSI I:99–207

Pemberton (Capt.) RB (1835) Report on the eastern frontier of British India. Department of Historical and Antiquarian Studies in Assam, Gauhati, reprint (1966) Mittal Publications, Delhi

Reid R (1942) History of the frontier areas bordering on Assam, from 1883 to 1941. Assam Government Press, Shillong, Reprinted (1983) Eastern Publishing House, Delhi

Robinson W (1841) A descriptive history of Assam: with sector on the local geography, and a concise history of the tea plant of Assam: to which is added a short account of the neighbouring tribes, exhibiting their history, manners and customs. Gowhatti Government Seminary, (1975) reprint Sanskaran Prakashak, Delhi

Shakespear (Col.) LW (1914) History of Upper Assam, Upper Burma and North-Eastern Frontier. Macmillan, London

Thomas O (1854) On the geological structure of parts of the Khasi Hills with observations on meteorology and ethnology of that district. F Carbery, Bengal Military Orphan Press, Calcutta

von Fürer-Haimendorf C (1962) The Apatanis and their neighbours. Routledge Kegan Paul, London

von Fürer-Haimendorf C (1969) Konyak Nagas. Holt, Rinehart & Winston, London

Wade JP (1805) A geographical sketch of Assam. Asiatic annual register, East India Co., Calcutta

Wilcox (Lt.) R (1832) Memoir of the survey of Assam and neighbouring countries executed in 1825, 1826, 27, & 28. Asiatic Researches, vol 17, map on page 314

Part I
Historical Outline

Chapter 2
North-East India Through the Ages

Abstract For long, North-East India was a terra incognita firstly because of its physical isolation but no less because of its being in a remote corner of India far away from the early ruling dynasties which were confined largely to the Ganga plain. The earliest known kingdom in the region, known as Pragjyotish/Kamarupa, was established by the Varman dynasty in the third century AD. The most illustrious ruler of Assam in the pre-Ahom period was Bhaskarvarman (AD 594–650). Through a succession of dynasties, viz. Varman, Salastambha, Pala and Vaidyadeva, all of which have left their imprint on the region, the region passed in the hands of Ahoms who came to Assam in the early thirteenth century, from the Shan region of Myanmar, settled in the eastern part of Brahmaputra valley, and ruled over Assam for 600 years. During the medieval period, Assam developed as a distinct politico-cultural unit. The region suffered repeated invasions from the Nawabs of Bengal, but none of the invaders could establish a permanent foothold in the region. Some of them even suffered defeat and had to retreat. Besides the Ahoms who ruled over much of the Brahmaputra valley, there were other dynasties who ruled in other parts of the region. The Koches ruled over western Assam during the sixteenth century. The 600-year reign of Ahoms came to an end in the early nineteenth century with the arrival of the British who dislodged the Ahoms and occupied the Assamese territory. The British, besides establishing their rule and administering Assam, expanded the Assamese territory, before they quit India in 1947.

The state of Assam, in a series of administrative manoeuvres, was divided into four states, viz. Assam, the parent state, Nagaland, Mizoram, and Meghalaya. Besides, the two princely states of Tripura and Manipur were merged in the Indian Union and came into existence as independent states. Another territory, North-East Frontier states, sandwiched between the Himalayas and the Brahmaputra, was made into a full-fledged state of Arunachal Pradesh. Thus, the seven states of North-East India came into existence. These seven states constitute North-East India. Together, these states have an area of 255,000 km^2 and a population of 45 million.

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North-East India, as we know today, is very different from what it was centuries ago. The region was not a part of India politically and not even administratively till the British unified it with the rest of India, with their conquest in the beginning of the nineteenth century. It was a land beyond Bengal to the North-East, a mountainous territory drained by the mighty Brahmaputra, known initially as Pragjyotish and later as Kamarupa, a name which remained in vogue for over thousand years before it was substituted by 'Assam'. The latter name was given to the region after the Ahom dynasty, which ruled over the region for 600 years, from the early thirteenth century till the first quarter of the nineteenth century. The British made Assam a province of India and expanded it by annexing a large part of the eastern hilly tribal territory. After India attained independence in 1947, Assam became a state of the Indian Union, subsequently expanded and divided into a number of minor states. Thus, North-East India today, a conglomerate of seven states, popularly known as seven sisters, is far removed from the early days of Pragjyotish or medieval Kamarupa.

During the first millennium of the Christian era, the region, not as fully explored as the present one, and confined largely to the lower region of what is present-day Assam, was ruled by a succession of dynasties of mixed descent who had adopted the Indo-Aryan cultural ethos and traditions and followed the religious practices and rituals enjoined by the Vedic tradition and emulated the royalty in the Gangetic plain. This was a period before the arrival of Islamic order in India and the establishment of Muslim rule. A broad genealogy of the ruling dynasties and the rulers of Kamarupa is traced by historians, starting from the seventh century AD till the arrival of the British, yet the history of Assam till the twelfth century is known only in broad outlines as gleaned from copper plates and inscriptions, as will be briefly discussed in the sequel.

2.1 North-East India, a Terra Incognita till the Sixth Century AD

There was hardly anything known about the North-East of India, or even present Assam, till about the beginning of the seventh century, a period marked by flourishing kingdoms in other parts of the Indian subcontinent. It is mainly because of the geographical isolation of the region, but in no small measure also the result of a slow spatial progression of the Indo-Aryan culture that moved gradually from the mid-Gangetic plain eastward. The movement of the Indo-Aryan people eastward, marked by the emergence of several kingdoms even before Christ, was slow to reach the Brahmaputra valley. They, as a rule, followed the Gangetic axial route and several of their kingdoms, strung along the river, included the fertile alluvial plain of Ganga and its tributaries. The easternmost extension of these kingdoms terminated in Gauda kingdom corresponding with the northern and western part of the present-day Bengal as well as part of eastern Bengal.

The Ganga–Brahmaputra divide, beyond 88° E, presented a formidable barrier for further eastward movement. It was marked by a number of Himalayan rivers, flowing almost north–south and frequently changing their course, and they needed to be crossed, one after the other, for further eastward movement. This had a restraining impact on the extension of Indo-Aryan regime further east. Secondly, a progressively increasing higher rainfall; flood-prone rivers especially Brahmaputra and its tributaries; and a forest clad marshy plain of Assam, teeming with wildlife and a none-too-healthy climate were also a serious deterrent to the conquest of the region. It may be emphasised that the physiographic conditions of Assam often played a deterministic role in the rout of many invading armies. During the early Christian era before the sixth century, there was no dearth of land in the mid-Gangetic valley and the unsettled and uncultivated land hardly exercised any attraction. It was only the expansionist spirit of the adventurous warrior kings, which often prompted them to invade a neighbouring territory.

2.1.1 Physical Isolation

India's North-East is as much a physical divide between the two continental drainage systems, one leading to the Pacific and the other to the Indian ocean, as it is between the two cultures, the Indo-Aryan and the Mongoloid. The Eastern Himalayas, attaining a height of 6,000 m, bend southward and merge into the Indo-Burma orographic chain, effectively separating the East and Southeast Asian region from South Asia. For millennia, this region has been one of the most inaccessible regions of the world. The chain of mountains – the Patkai, Naga and Lushai Hills from north to south in that order – dissected, forest covered and experiencing heavy rainfall and sparsely inhabited by tribal people, some of them head hunters, with hardly any contact with the rest of the world, did not induce any significant immigration. Any east–west movement was virtually blocked. North-East India remained for long a nature preserve, a sanctuary for biological evolution and perhaps a rare niche for homeostasis.

The two river valleys – Surma and Brahmaputra – with their annual floods inundating large tract of their narrow plains, associated with frequently occurring *bhils* cut-offs, wild animals and forests, did not present a picture of a hospitable terrain nor did it exercise an economic attraction based on its agricultural potential. Thus, establishment of a well-organised kingdom in the early part of the Christian era, as much as the development even after the region came to be administered, was retarded.

2.2 Early History of Kamarupa

The earliest history of Assam based on epics and scriptures starts with Narakasura, the king of Pragjyotish whose descendent Bhagdatta participated in the Mahabharat war. The Naraka–Bhagdatta episode, originating from *Mahabharat*, *Vishnu Purana* and

Kalika Purana, which suggests the rise of a dynasty, may not be authentic, yet it can't be ignored altogether. The historical existence of a succession of kings in the Varman dynasty is proved in the epigraphs, which link Pusyavarman, the first king of Varman dynasty to Naraka–Bhagdatta.[1] The political history of ancient Assam, however, begins with the foundation of the Varman line of kings, in which Pusyavarman was the first historical ruler. The most important king in the Varman dynasty that seems to have lasted till the end of the seventh century was Bhaskarvarman, the illustrious monarch of Eastern India. He was a contemporary of Harsha of Kanauj, and his reign is placed between 594 and 650 AD (Harshcarita sixth century Sanskrit text). The reconstituted genealogies of different dynasties, however, don't throw any light on the social structure and economy of early times.

A panegyric presentation of the virtues of a king, sometimes of uncertain existence, does not mean much as a source of history. What is, however, significant is the fact that Pragjyotish or Kamarupa, as a country, was known to the authors of the early scriptures and epics ranging from the fifth century BC to second century AD. The history of ruling dynasties and a glimpse of their administration are better anchored in reality and in some cases rest on unassailable ground, when seen in the light of several inscriptions that have been discovered in several parts of western Assam and Bengal. Gait (1906) refers to six principal inscriptions that were discovered till the first decade of the twentieth century.[2] Choudhury (1959) of a later date enumerated 25 inscriptions discovered in Assam and another 12 in other parts of India. These inscriptions are complemented by the accounts of the famous Chinese scholar Hiuen Tsang who visited Kamarupa in the first quarter of the seventh century. Not all inscriptions are of equal value. A large number, in fact most, of the epigraphs are undated, and only a few have recorded the year of inscription or the period of the rulers.

These inscriptions when collated together and compared with other documents produce four main families and four dynasties that ruled over Kamarupa between first and twelfth century AD (Table 2.1).[3]

The long period of over a thousand years from first to twelfth century, in the history of Kamarupa, is rather sketchy. But, besides an approximate genealogy of kings, their occasional conquests of the neighbouring territories, there is hardly anything by way of culture of people and their achievements that is handed down to us. Events are clearer after the thirteenth century when the invasion of Muslim rulers of Bengal from the west and that of the Ahoms from the east of Brahmaputra valley started. Over a thousand years of unrecorded history of Kamarupa suggests a quiet period. Kamarupa may have been a kingdom with limited governance, existing on the margin of the Gangetic plain. The tribal population appears to have followed their own age-long ritual practices without any interference. The religion of the king

[1] Doobi Grant (VV-9-6) states that the lineage of Naraka was Barna a king of kings, named Pusyavarman, equal to Siva in honour and fame.

[2] Gait refers to the following six inscriptions: (1) Nidhanpur grant also known as Panch Khanda (Sylhet) grant of Bhaskarvarman; (2) Tezpur grant of Vanmala; (3) Nowgong grant of Bala Barman; (4) Siralkuchi and Bargaon grant of Ratnapala; (5) Gauhati grant of Indrapala; and (6) Banaras grant of Vidya Deb. E. A. Gait (1926:22).

[3] For names of kings and their conquests refer to Choudhury (1959:128–257).

Table 2.1 Ruling families and dynasties of Kamarupa

Families[a]	Capitals	Dynasties	Period
1. Naraka–Bhagdatta	Pragjyotishpur	Varman dynasty with 25 kings	First century A.D. to seventh century
2. Madhava	Haruppeswara (near Tezpur)	Salastambha dynasty with 21 rulers	690–990 A.D.
3. Jitari	Durjaya (on the bank of Brahmaputra)	Pala dynasty with eight rulers	990–1138 A.D.
4. Arimatta	Bairagarh (Kamrup district)	Vaidyadeva dynasty	1138–1200 A.D.

Source: Choudhury (1987:128–257)

[a]A tentative chronology of ruling dynasties of Kamarupa with names of kings and periods of their reign also occurs in Gait (1906) op. cit.:343

did not seep through to the subjects. As is evident from the names and the epigraphs, the kings of all the dynasties appear to be following Vedic religion. The capitals of Kamarupa may have shifted from Pragjyotish to Haruppeswara in the beginning of the ninth century or to Devjaya around 1,000 A.D. for strategic reasons but 'Pragjyotishpur' ever remained the focal point of the state.

A brief account of Hiuen Tsang turns some light on Bhaskarvarman the king of Kamarupa in the early seventh century as well as the character of the land. His account of Guwahati, the capital, as a city lying at a lower level with several water bodies and abounding in fruit trees speaks of his observations. His description of people, their language, temperament and their belief in 'devas' (as opposed to Buddhism) and their love of learning, all points to Brahmanical culture among the educated. His observation of about a large number of temples and the absence of any 'sangharama' shows his dismay over the poor health of his own faith, i.e. Buddhism in the region. His conclusion that Bhaskarvarman, the king, was a Brahman may not be correct, but it does suggest the royal predilection for Vedic rituals. This is confirmed from the fact that language of the inscriptions of his times, and even later dates, is written in Sanskrit and major beneficiaries of royal charity appear to be Brahmins. He talks of tribal population in the eastern hills on his way to south-west China and calls them 'barbarians'. What is certain is that the hilly region between China and India was colonised by tribal folks even 1,500 years ago. The capital town as described by him was 30 li (about 5 miles circumference), which does not appear outlandish and benefits the size of an early Kamarupa.

2.2.1 The Extent of Early Kingdoms: Pragjyotish or Kamarupa

The earliest kingdom occupying the territory presently known as Assam was, for long, referred to as Pragjyotish or Kamarupa. Both the names enjoyed equal antiquity and represented the same territory with some shrinkage or expansion during

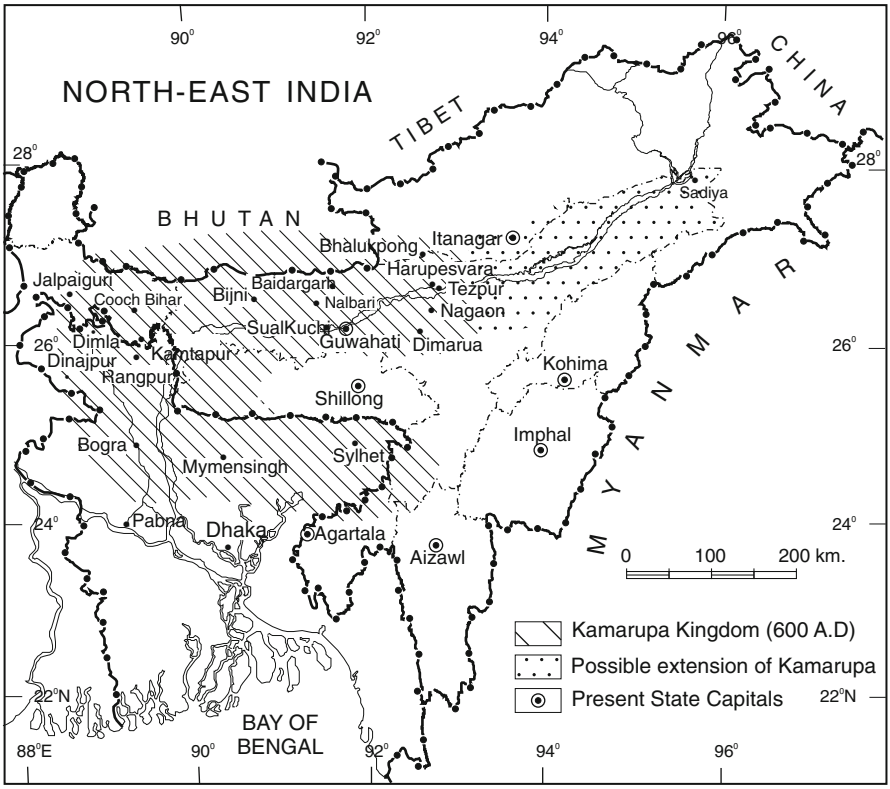

Fig. 2.1 North-East India: extent of Kamarupa Empire in the sixth century during the rule of King Bhaskarvarman (593–650 AD)

different periods of history. 'The close association of Pragjyotisha with Lauhitya and Kamarupa – Kamakhya in both epigraphs and literature points to their existence in the same region from dawn of history' (Choudhury 1987:38).

Not much is known about the geography of Kamarupa as it existed before 1,200 AD. What is repeatedly stated by the *Puranas,* especially the *Vishnu* and *Kalika Purana,* is the fact that Karatoya river formed the western boundary of Kamarupa. The eastern boundary of the kingdom remained undefined, as there was no ruling power eastward to force a definition of the boundary or pose a threat. With a small population of perhaps a few hundred thousand, it is likely that the kingdom of Kamarupa did not extend much to the east along the Brahmaputra, except a possible extension in the Kopili valley with its fertile alluvial plain (Fig. 2.1).

The actual areal extent of this ancient kingdom is difficult to determine, yet on the basis of references in the *Puranas* and epics Pargiter (1897) concluded that the kingdom of Kamarupa, during the time of epics, included a greater portion of modern Assam, along with Koch Bihar, Jalpaiguri, Rangpur, Bogra, Mymensingh, Dacca, Tripura, portions of Pabna and probably a portion of Nepal. A similar,

though not quite identical, view is expressed by Gait (1906), who, quoting *Jogini Tantra*, a Hindu *tantric* text, suggests that 'Kamarupa extended from the Karatoya river on the west to the Dikhu on the east, and from mountain of Kanjagiri on the north to the confluence of Brahmaputra and Lakhya rivers on the south: that is to say, it included roughly the Brahmaputra valley, Bhutan, Rangpur, Koch Bihar, the north-east Mymensingh and possibly the Garo Hills' (Gait 1906:10). The description of Kamarupa by the Chinese traveller Hiuen Tsang, who visited the kingdom in the first half of the seventh century, suggests rather vaguely the extent of Kamarupa, but one of his remarks was literally taken by Gaits to suggest that Kamarupa 'extended as far to the east as does the modern province of Assam'. This was based on the statement of Hiuen Tsang which says that 'on the east, this country is bounded by a line of hills, so that there is no great city to the kingdom. The frontiers are contiguous to the barbarians of south-west China' (Gait 2006:23).

The above statement of Hiuen Tsang prompted Gait to assume that the kingdom of Kamarupa extended as far east as does the modern province of Assam. This assumption or inference of Gait is not sustainable in view of many uncertainties, the most glaring of which is the capital of Kamarupa. Nowhere is it clearly explicit that the capital of Kamarupa ruled by Bhaskarvarman was 'Guwahati'. The areal extent of Kamarupa has to be assessed in view of the orientation of the early kings toward Bengal and Magadh, Sanskrit learning and Aryan tradition. Secondly, the agriculturally fertile and revenue-yielding areas lay to the west of Guwahati. East of Guwahati, the terrain was flood prone, marshy and forested, and the early kings did not see much benefit in extending their kingdom toward the upper Brahmaputra valley. The kingdom of Kamarupa, as seen in the map, shows the greater part of Bengal and even part of Garo Hills, but as far as its extension to the upper Brahmaputra valley is concerned, the present author thinks of this only as a remote probability.

2.2.2 Boundaries of Kamarupa and Other Early Kingdoms

The boundaries of the early kingdoms, including Kamarupa, were fluid and fluctuated with the rising power of the adjacent rulers. Often the border was marked by a river. Barnadi, a northern tributary of Brahmaputra, presently in Barpeta district, was often made the boundary between feuding pretenders in western Assam. The seat of kingdom was far more important. Most of the early dynasties till the arrival of the Ahoms in the early thirteenth century were confined to lower Brahmaputra valley. Even the Ahoms with their capital near Sibsagar did not have a well-defined boundary to their kingdom. More importantly, bits and pieces of territory were periodically ruled by local chiefs.

The question of the boundaries of early kingdoms is debated by the historians even today. The western boundary of Kamarupa is discussed by Bhattacharjee (2010) who thinks 'it is plausible that the boundaries of both territories – Paundravardhan and Kamarupa – experienced changes that resulted in the inclusion of both the regions within the perimeter of each other at different points of time'. A similar view is echoed

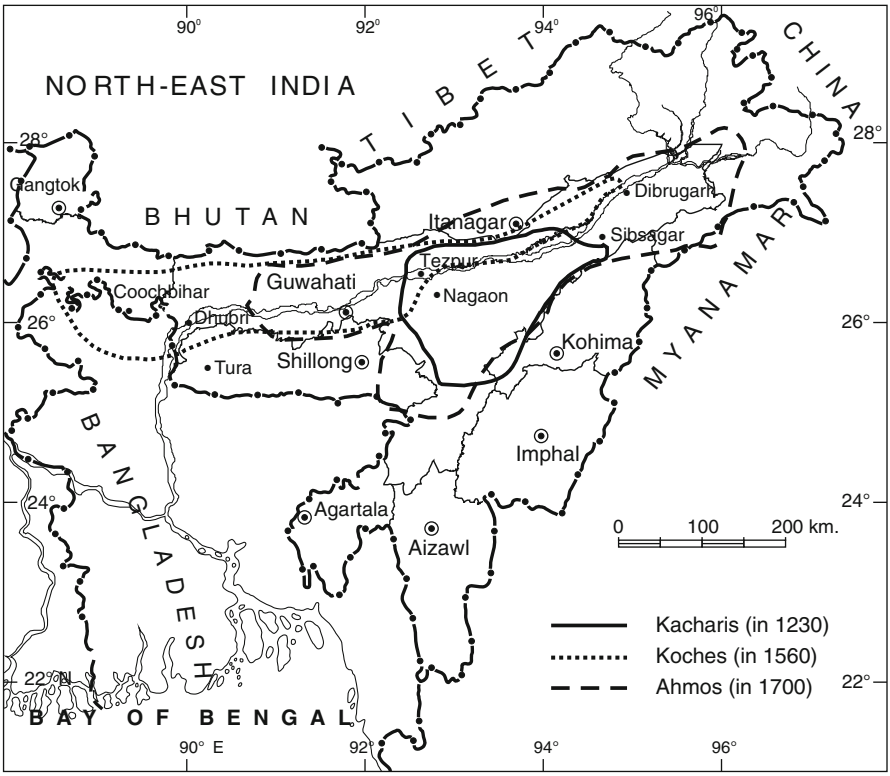

Fig. 2.2 Chief ruling dynasties of Kamarupa during the Medieval period (Adapted from Shakespear 1914)

by Nirod Barua (2010) as he believes that the 'pull and push of the boundary in this region from time to time, from the Kamarupa and Bengal sides, was a common feature of the expansion policies of the ruling dynasties'. This is clearly borne out by Shakespear's map (1914) (Fig. 2.2) showing the boundaries of the Koches, the Kacharis and the Ahoms, overlapping each other.

2.2.3 Emergence of Assam as a Distinct Politico-Cultural Entity

Before the close of the first millennia A.D., the ruling dynasties of Kamarupa had not only adopted Hinduism as their religious faith but even actively promoted it. The two kings of Salastambha dynasty, Harjaravarman, the king of kings, and Vanmalavermadeva, the empire builder of Assam, not only extended the physical limits of their kingdom but actively encouraged the growth of literature, art and

culture. Harjaravarman, who ruled over Kamarupa in the ninth century and built a new capital at Haruppeswara, was a devout Saivite, a follower of Saivism sect of Hinduism. He had his coronation performed in conformity with the Vedic tradition and built lofty Siva temples and rows of stately buildings in the capital city Haruppeswara. The ruins of the temples and the buildings can still be seen around Tezpur town. This was the period when Assamese, as a modern Indo-Aryan language, was gradually taking shape and making its appearance besides the regional tribal dialects and Sanskrit, the last confined to the priestly class. The development of unwritten poetry, exemplified in pastoral ballads, like *Bihu Geet* or wise sayings like seen in *Dakabanita* of eighth or ninth century was very common. 'By A.D. 1000, judging by the specimens of Bengali, Assamese and Oriya that we have, at about this date and a little later, these languages had been fully established. Thus, 1000 AD may be roughly taken as a convenient date for the development of the new Indo-Aryan stage in the history of the Aryan speech' (Chatterjee 1955). A couple of centuries later, Assamese crystallised as a regional language. This was a nascent phase in the evolution of a society bonded together by Assamese as a common language, Hinduism as a common religion and a royalty that promoted language and literature and spread Hinduism among its subjects, largely the members of the local tribal community. This brought about some measure of sociocultural unity among the people. The kings of Kamta, as Kamarupa was known for some time in the late thirteenth century, encouraged the growth of Assamese language and invited poets and literary figures in their court. A few names that appear as the vanguards of Assamese literature like Hema Saraswati, Harihara Vipra and Kaviratna Saraswati enjoyed the patronage of Kamateswar kings having their capital at Kamta. These litterateurs rendered many episodes from Purana or Mahabharata, originally in Sanskrit, into Assamese. Great strides were made in architecture as can be seen from the ruins of temples, especially at Dah Parbatiya and Bamuni Pahar in the vicinity of modern town Tezpur, on the northern bank of Brahmaputra (Photo 2.1).

The dominance of Indo-Aryan culture, the emergence of Assamese as a language of communication besides developing a literature of its own and the rise of Hinduism combined to mould Kamarupa into a political and sociocultural entity which the ruling dynasties and the people defended against the onslaught of Nawabs and their generals from the neighbouring Bengal.

2.2.4 The Onslaught from Neighbouring Bengal

The beginning of the thirteenth century witnessed the appearance of invaders in Kamarupa from west as well as east. While the Muslim Nawabs of Bengal and their generals invaded Assam from the west, the Ahoms, a Shan tribe from northern Burma (now Myanmar), entered from the east crossing the Patkai range and descending into the Brahmaputra valley. The onslaught of Bengal Nawabs started with Bakhtiyar Khalji (1205) in the early thirteenth century, followed by Ghiyas-ud-din (1227) who made an abortive attempt to conquer Kamarupa and then Ikhtiyar-ud-din Yuzbak Tughril Khan

Photo 2.1 Ruins of a temple at Bamunia Hill near Tezpur, Assam

(1257) who invaded Kamarupa and was killed during the war. There was some quiet and Kamarupa experienced some peace, but again in 1337, Mohd. Shah invaded Kamarupa and the invasion ended in a disaster for him and his forces. Despite a temporary victory or defeat, the invaders from Bengal could not establish their permanent foothold as they had done in Bengal. More often, they had to beat a hasty retreat forced by extenuating conditions, involving floods, epidemics and bad weather. It was in the late fifteenth century again that Husain Shah of Bengal conquered the region and annexed the Kamarupa kingdom. He made Hajo, in Kamrup district, the headquarters of his administration and left his son behind to administer the territory. *That was the end of the Kamarupa Empire*. The footprints of Muslim invasion can be seen in many mosques and *dargahs* of thirteenth and fourteenth century in several parts of the state.

The rule of Husain Shah and his successor could not last long, and soon they were thrown out of Brahmaputra valley by Koches who rose to power at the close of the first quarter of the sixteenth century.

The Ahoms, who entered the Brahmaputra valley from the east, gradually expanded their rule by subjugating small tribal chiefs in the east and more established petty kings in mid-Brahmaputra valley and the bordering hilly region finally establishing themselves as rulers of Assam.

2.2.5 The Beginning of Recorded History

Most of the ruling dynasties of Assam and the adjacent regions, during the medieval period, have produced a chronicle of events of their reign. The most authentic and

outstanding of these are the *Buranjis*, produced and preserved by Ahom rulers. Written on the bark of trees, the 17 *Buranjis*, 6 in Ahom language and 11 in Assamese, give a complete picture of events during the 600 years of Ahom rule. Similarly, Manipur, the erstwhile princely state, has a royal chronicle called *Cheitharol Kumbaba* that gives an account of the rule of different tribes in Manipur, in Imphal valley and the adjacent hills. Similarly, Tripura has its own chronicle called *Rajamala* that gives elaborate account of the kings and the important events of their reign. The Koch kings, though they ruled for a relatively short period of only a couple of centuries, had their own chronicle, called *Bansabali*, written in verse. It was compiled by the Darrang branch of the Koch dynasty in the beginning of the nineteenth century. Besides, the writings of Muslim historians who accompanied the invading armies also added to the historical material of the medieval period. Thus, the history of the ruling dynasties of North-Eastern India, the Ahoms, the Koches and the kings of Manipur and Tripura from twelfth century onward, are relatively well recorded.

The areas of the North-East, like Lushei Hills (Mizoram), Naga Hills and the dissected hilly terrain of Arunachal, were explored much later, and the encounters between the British and the bordering tribes and occupation of their territories and their merger with Assam are well recorded by British writers – administrators, army officers and surveyors. The four basic texts (Mackenzie 1884/reprint 1955; Shakespear 1914; Gait 1906/1926/reprinted 2005; Reid 1942) with gazetteers for each region narrate in great detail the encounter with different tribes and extension of the British rule over the bordering tribal territory.

2.2.6 *The Situation in Eastern Assam During the Medieval Period: The Rule of the Ahoms, the Kacharis and the Chutias*

After the decline and fall of the Pala line of rulers, the last of the Hindu dynasties, in the mid-twelfth century, there was a virtual administrative vacuum. The space vacated by rulers was occupied by local chieftains and the Bhuiyans. The emergence of a number of small and large principalities, competing with each other, soon filled the entire Brahmaputra valley. Before the Ahoms arrived in Assam in 1228 and made Charaideo their capital in 1253, eastern Assam was ruled by a few ruling dynasties and some tribal chiefs, each occupying a relatively well-defied territory.

The rulers of Eastern Assam, in thirteenth and fourteenth century, included the Kacharis, the Chutias, the Morans and the Borahis. The first two were established kingdoms and the last two were tribal chiefs. The *Kacharis* were a well-known dynasty of Bodo origin. Their kingdom in the thirteenth century extended along the southern bank of Brahmaputra from Dikhu to Kalang and also into the valley of Dhansiri river, with their capital at Dimapur. Westward their kingdom extended up to Kopili valley. The *Chutias* ruled the territory north of Brahmaputra, coinciding with present Lakhimpur and Dhemaji including part of Lohit district centred around Sadya. The Chutias were ruling the territory from the beginning of the thirteenth

century. The *Morans* occupied the terrain between Dikhu and Dangri rivers, coinciding perhaps with the present Tinsukia – Damdama region. They had a tribal chief as their ruler, were not as well organised as the Chutias and could be easily overrun, and *Borahis* were a community in the neighbourhood of Sibsagar.

2.3 Western Assam and the Rule of Koches (1515–1726)

This section of a brief historical account of Assam need to be prefaced with an observation that Western Assam was seldom, if ever, ruled by Ahoms whose reign remained confined largely to the east of Gauhati. In fact, much of western Assam, though a part of Kamarupa that extended from Gauhati westward up to Karatoya river, had much greater affinity toward Bengal rather than present-day Assam.

2.3.1 The End of Kamarupa and the Advent of a New Era

In the period that followed the invasion of Husain Shah (1498) which saw the overthrow of the last king Nilambar of Hindu dynasty and the end of Kamarupa kingdom, there was a virtual vacuum. This was an opportune time for the patriarch of the Koch dynasty, Biswa Singh, who subdued the local chieftains and laid the foundation of Koch kingdom in 1515. The core area of the kingdom extended from Karatoya river in the west to Barnadi in the east. Besides, the conquest of Chila Rai, the younger brother of the Narayan, the successor king, periodically enhanced the area by annexing additional territory, as it happened following the defeat of the Ahoms in 1562, when the territory on the northern bank of Brahmaputra up to Narayanpur was ceded to the Koch dynasty. The dynasty later on divided into two branches, ruled till 1725, when they were reduced to small chiefs and landlords.

The Ahoms, on the other hand, were well established in eastern Assam with their capital at Garhgaon or Rangpur near Sibsagar and ruled the territory east of Kalang river, with a periodically fluctuating boundary, varying with the pressure, onslaught and occupation of Gauhati by the Nawabs of Bengal. Alternatively, the area of central Assam remained a territory ungoverned by a major dynasty and was ruled by Bhuiyan chiefs who always existed as vassals, but declared independence whenever there was a political void.

It has to be emphasised that the Koches, unlike the Ahoms, were the natives of Assam. In fact, they had the Bodo roots, like the Kacharis, Garos, Lalung or Mech. Biswa Singh, the patriarch of the dynasty, was essentially a Bodo, and only after conversion to Hinduism and attaining royalty, he came to be known as Biswa Singh and his followers as Rajbansis. The term 'Rajbansi' implies belonging to a royal family. Thus, the mass of people who identified themselves with Koch kings were known as Rajbansis. Biswa Singh turned out to be a devout Hindu, who rebuilt Kamakhya temple and induced learned scholars to settle in his kingdom. Always under pressure

from the Ahoms, who perceived a threat in him, Biswa Singh, the Koch king, shifted his capital westward from Chikanram to the newly established town of Cooch Bihar, the seat of the Koch kings. Cooch Bihar, though on the route of the Bengal Nawabs who frequently invaded Kamrup, was secure enough for a quick retreat to the hills, offering at the same time considerable scope for expansion of the kingdom in Bengal. This also helped the Koches to foray into even the Ahom territory, without any fear of being evicted from their capital by the Ahoms who could not traverse 600–700 km away to reach Cooch Bihar leaving their capital unattended. After the death of Biswa Singh, his son Malla Deb with an assumed name Nar Narayan ascended the throne, with his brother Chila Rai as the army chief. This was a very unique brotherly combination with Nar Narayan adept in state craft and Chila Rai excelling as a general.

The expansion of the Koch kingdom was very rapid. The Koches expanded the kingdom eastward. They invaded the Ahoms (1562) in which the latter were completely defeated, on both banks of Brahmaputra, and the Koches even entered Garhgaon, the capital of the Ahoms. As a consequence the Ahoms had to accept the suzerainty of the Koches and pay heavily in war reparations. The Koches built a fort at Narayanpur in the western part of what is now Lakhimpur district. But what is more spectacular is a 350 mile (560 km) long road on an embankment, running from Cooch Bihar to Narayanpur. This road is known as Gosain Kamal Ali, after the name of the king's brother who supervised the building of this road.

The Koches at the height of their power, during the mid-sixteenth century, not only subdued the Ahoms but even the Rajas of Manipur. The Kacharis and the kings of Jaintia and Tripura had to submit to them. Despite their kingdom having a limited expanse, there were quite a few kings and chiefs who accepted their suzerainty. From the mid- to late sixteenth century was the golden period of the Koch kingdom, after which it was divided into two parts, the western and the eastern. The western part, with its capital at Cooch Bihar, remained as it was under the control of Lakshmi Narayan, the son of the king, and the eastern part known as Koch Hajo with its capital at Barnagar was given to a co-lateral pretender to the throne, Raghu Rai. The independence of both these branches of Koch kings soon came to an end under the onslaught of the Nawabs of Bengal. The western part of the kingdom accepted the vassalship of the Nawabs and subsequently of the British; the eastern part was gradually reduced to the status of a petty chief and finally ended in 1725. The main Koch kingdom with its capital at Cooch Bihar remained intact, firstly as a vassal of the Moghul emperor and Bengal Nawabs and subsequently as a feudatory state of British India, after the transfer of diwani rights of Bengal to the East India Company.

2.3.2 Koches as Royalty and Lovers of Culture and Learning

The military campaign of Chila Rai, the brother of Nar Narayan, was well organised like a 'blitzkrieg', and he could be compared with the best generals of history. In a space of less than half a century, the Koches were able to expand their empire and achieve power and glory that no other ruling dynasty of Assam could ever achieve.

It is not only the military prowess of the Koches that attract so much of appeal, but equally, or even in a larger measure, it is their love for culture, art and learning that elevates them to a status that the other ruling dynasties could not aspire after. Besides being great builders, as is evidenced from the city of Cooch Bihar and the great northern embankment road, called Gosain Kamal Ali, they also built a number of temples and tanks. They demonstrated a heightened sense of state craft by sharing power with his twelve ministers from the chief families of Meches, thus commanding their loyalty that strengthened their grip on administration. The Koches demonstrated a unique trait of tolerance of individual faith and allowed believers of all faith to practise their creed. The followers of Sankardeb who were persecuted by some of the Ahom kings found refuge under the patronage of Koch kings. Some of the Vaishnavite saints like Sankardeb and Madhab, poets like Rama Saraswati and Sarva Bhauma Bhattacharyya and grammarian Purushottam Vidya Bagish enjoyed the patronage of Nar Narayan, the longest ruling Koch king. According to B K Barua (1949:17) 'the golden age of Assamese literature opened with the age of Nar Narayan'.

The rule of Koches was firmly rooted in the soil of Assam. The Koches grew from the region; they were familiar with different tribes and castes, the economic potential of the land and the conditions of terrain. This helped them rapidly organise themselves, resist pressure from rival groups and dominate a large territory in western Assam of which they were kings. The selection of Cooch Bihar at the western extremity of Kamarupa was of a great strategic significance, though in due course, it proved disastrous. Being on the border of Bengal, Cooch Bihar attracted the attention of the Moghuls who marched through the Koch territory. In due course, the Koches found themselves squeezed between the Moghuls and the Nawabs of Bengal on the one hand and the Ahoms on the other. After a series of skirmishes with the neighbouring powers, the Koches lost ground and their country was divided between the Ahoms and the Mohammadans.[4] The Koches were finally reduced to small chiefs, and their dynasty ended by1638. The eastern branch of Koches, the Koch Hajo, continued as a vassal of Ahoms till the beginning of the eighteenth century. With the accession of the Ahom kingdom in the British territory, the Koches became a feudatory state of Bengal and continued as a princely state till 1947, when the state of Cooch Bihar, like the other princely states of Bengal and Assam, was merged in the Indian Union as an administrative district.

2.4 The End of Kamarupa Kingdom, the Arrival of the Ahoms and the Birth of Assam

The Ahoms, belonging to Tai race, commonly known in Myanmar as 'Shans', arrived in India in 1228. Their leader Sukapha, having left the home territory in 1215, wandered around for several years, facing hostile hill tribes including Nagas whom he defeated,

[4] The historians of Assam including E. Gait often don't distinguish between the Moghuls and the Nawabs of Bengal and refer to all of them as Mohammadans.

and reached the mouth of river Dikhu, a tributary of Brahmaputra, in 1244. From there, he shifted subsequently to Laherigaon and then to Simaluguri in 1246 and finally settled at Charaideo in 1253, where he built a city. Before his death in 1260, Sukapha subdued the neighbouring tribes of Morans and Borahis. He, in fact, encouraged intermarriage with the Morans and gradually established a friendly relation with them.

It is believed that while leaving his home territory 'Maulung' in Myanmar, Sukapha had with him eight nobles, 9,000 men, women and children but mostly adult males, besides two elephants and 300 horses. Subsequent immigration of Shans added to the strength of the Ahoms. The successors of Sukapha had to contend with the Chutias ruling the territory on the northern bank of Brahmaputra, the Tipan chiefs and finally the Kacharis who were the most well-established dynasty.

2.4.1 The Expansion of the Ahom Kingdom

Before the arrival of the British in Assam, the three dynasties that ruled different regions of the Brahmaputra valley were the Ahoms, who ruled the longest; the Kachari; and the Koches. The last two ruling dynasties, unlike the Ahoms, were of local origin. Both the Kacharis and the Koches had their roots in the indigenous 'Bodo' group and could be compared to other tribes of the region, like the Mech, Garo, Lalungs or any other. The only difference was that these two groups, at some period of history, dominated certain parts of the Brahmaputra valley, attained royalty and started ruling a territory large enough to be called a kingdom with a well-developed administrative set-up.

The Kacharis were already ruling the region drained by Dhansiri river before the arrival of the Ahoms in the early thirteenth century. With their capital at Dimapur, the kingdom included the area of North Cachar besides the part of Brahmaputra valley proper from the river Dikhu in the east to Kalang in the west, the area that coincides today with western part of Jorhat district and the whole of the Golaghat district.

Following some regular border skirmishes between the ascending Ahoms and the well-established Kacharis that escalated into a decisive battle, the Kacharis were defeated in 1531. Their capital Dimapur was ransacked and part of their kingdom annexed into the Ahom territory. The Kacharis shifted their capital to Maibong, now in North Cachar Hills, and further to Kashgar, finally settling into Cachar plain.

2.4.1.1 The Chutias

The next to succumb to the pressure of Ahoms were the Chutias who ruled the area of Lakhimpur and Sadiya with their capital at Sadiya, a town that was completely destroyed during the 1950 earthquake. A believer in 'Sakti' sect of Hinduism, the dynasty ruled the area since the beginning of the thirteenth century. They were subdued and their kingdom annexed into Ahom territory in the early sixteenth century.

Being located in the trans-Brahmaputra region, the Ahoms took some time to conquer them. The annexation of Chutia kingdom was virtually the last phase in the consolidation of the Ahom kingdom.

Hardly had the euphoria following the rout of the Chutias and the annexation of their kingdom died down, when the Ahoms had to face the Koch invasion (1562) and sue for peace in humiliating terms including the acceptance of the suzerainty of the Koch kings.

An unprecedented century of quiet between the mid-sixteenth and mid-seventeenth century was broken by the massive invasion of the Moghuls under their general Mir Jumla. The Ahoms, after initial resistance, had to surrender. The terms of the treaty (1663) that was concluded were most humiliating to the Ahoms, though the war was equally damaging to the Moghul army that was decimated because of a terrain, climate and attrition inflected by the Ahom army.

The Ahoms ruled over half of what we understand by Assam today, for about 600 years, which witnessed the reign of 40 kings. During their prolonged rule, they had many spectacular victories, yet suffered two major defeats, one at the hands of Koches of Koch Bihar and another, far more humiliating, at the hands of Mir Jumla, the governor of Aurangzeb. These defeats, though humiliating, did not have a lasting impact on them and even prepared them for the future. The geographical position always came to their rescue. Most of the times, victory and defeat alternated. Yet, the final battle that was fought with the Moghuls in 1671 was a battle the entire Assam fought against the invading army of the Moghuls. This was the battle of Saraighat.

2.4.1.2 The Great Battle of Saraighat (1671)

The great battle of Saraighat that Ahoms fought and won against the Moghuls is a very distinct event in the history of Assam. This was the end of the Moghul challenge to the power of the Ahom kings. The rout of the Moghul forces and a decisive victory in this battle are events of which every Assamese is proud. This signified upholding the honour and dignity of the Assamese people, their spirit of resistance and freedom. This is an event, which is quoted in every publicity material on Assam, which talks of the indomitable courage and bravery of the Assamese people. In fact, this was a watershed after which there was no invasion from Bengal. This further led to the consolidation of the Ahom rule over Assam, at least for next one and a half century. It is quite likely that the victory in the battle of Saraighat gave the ruling Ahoms not only a confidence in their own military prowess but also bred a kind of arrogance that led to a selective religious intolerance that finally led to their downfall and ouster of power.

2.4.2 The Rule of Ahoms and the Assamese Society

In the recorded history of the North-East, no other dynasty ruled for such a long period as the Ahoms. For 600 years (1228–1828/1838), they were the masters of the

Assamese territory east of Guwahati, the western part being ruled by a succession of dynasties, ending with the rule of the Koches. Locating their capital at Ghargaon, near Sibsagar, in the extreme eastern part of Assam, secure from the invading foes of Bengal, they enjoyed an uninterrupted reign over Assam with a couple of reverses when they had to concede defeat and accept humiliating terms of treaty as it happened in 1663 when they had to submit to the Moghul general Mir Jumla. The subsequent battle of Saraighat, in which the Moghul army was routed, put them back in the saddle of the empire. Most of the invasions from Bengal remained confined to the western half of the Brahmaputra valley from where the invaders were forced to retreat sooner than later. The Ahoms remained unchallenged for major part of their rule. For a region that was split into chiefdoms and shaky monarchies, the Ahoms were a unifying force, bringing under them a large territory and imparting a measure of political and administrative stability. There was, however, not much to commend in their administration.

Ruling through a hierarchy of functionaries, some of them holding hereditary offices, the Ahoms were ruthless in the preservation of their kingdom, expecting fierce loyalty from all, but, with a complete disregard for the welfare of their subjects. The entire society was divided into two groups, the privileged nobility and the rest known as *paiks*. The privileged class consisted of the functionaries of the state, starting from the three Gohains, Bar Gohain, Bura Gohain and Barpatra Gohain, that formed the apex ministerial council of the monarch, right down to the level of Voras who were perhaps the least privileged. Added to this group was the priestly class, the religious *gurus* and *mahantas* and local chieftains. The hierarchy of functionaries included the Gohains, as mentioned above, followed by Bar Phukan, Bar Barua, Hazarikas, Saikia and Voras, and many other Baruas in charge of different aspects of administration. Economy was not monetised, and the state granted land worked by the *paiks* instead of money. The higher the position of a functionary in the chain of command, the more gracious was the grant of land and the higher the number of *paiks* assigned to that functionary.

2.4.2.1 The Paik System

The country ruled by the Ahoms was managed through the *paik* system under which, 'the whole male population, with the exception of nobles, priests and the persons of high caste and their slaves, between the ages of 15 and 50 were liable to render service to the state' (Gait1906/reprint 2005) as decided by the administration, for a period of 3–4 months every year. The *paiks* were broadly grouped in two categories, viz. *kari paik* and *chamua paik*; the former were the actual foot soldiers required to render manual service, and the latter rendered nonmanual services (Sarma 1981). Organised into *gots,* each *got* consisted of three or four paiks who worked in turn to complete the yearly cycle. In return, a paik got three acres of rent-free paddy land with a free plot of land for homestead. These *paiks* were consolidated into *khels* of different strength, to be assigned to the functionaries at different levels of hierarchy. Thus, a *vora* had the privilege of the services of 20 *paiks*, a

saikia 100, a *hazarika* 1,000, a *rajkhowa* 3,000, a *phukan* 6,000, the Bar Barua 14,000 and the 3 Gohains had the privilege of having for their own use 10,000 *paiks*.

Thus, the entire peasantry was required to do forced labour. Besides, there was a huge mass of slaves owned by the privileged landowners, and there was a veritable trade in slaves who could be bought and sold. The system of governance was exploitative in which the nobility, the priestly class and the high officials flourished and lived off the hard labour of the paiks. The class system was not only allowed to persist but even enforced. Poor peasants had to face all kinds of restrictions; they were not allowed to wear silk or costly ornaments nor could they use all kinds of conveyance. Gabled-roof houses were the monopoly of royal families (Sarma 1981). They were not permitted to wear shoes nor ride a palanquin nor cover their bodies with a decent shawl or wrapper. The depressed classes were required to tattoo some kind of distinguishing mark on their head, and they were not permitted to build masonry houses for their use (Gait 1906).

Class distinction was severely enforced. The system of forced labour, though harsh and involuntary, released huge manpower that was utilised in building roads, tanks and embankments.

2.4.2.2 Reformist Movement and the Emergence of a New Religio-Social Order

While the Ahoms consolidated their kingdom in upper Brahmaputra valley and the Koches ruled Lower Assam from their capital at Cooch Bihar, the peasantry that formed the economic backbone of the kingdom was completely neglected. They were an exploited and helpless lot. Added to this were the religious practices, which though abhorrent cost the peasantry a great deal in appropriating the God and the priestly class. Before the fifteenth century, the principal deities were 'Shiva' and 'Sakti'. While the worship of Shiva was moderately ritualistic, the worship of Sakti, the female god, was highly ritualistic and involved violence and animal sacrifice, besides licentious practices, orgy and an occasional human sacrifice. This had an unsettling influence on the society.

Late in the fifteenth century, a reformist movement launched by poet saint Sankardeb (1449–1563) preached abjuring violence and animal sacrifice, did away with ritualistic practices and gave the message of equality before God. This was 'Vaishnavism', worship of god 'Vishnu', pure and simple, and meant complete surrender before God. Chanting the name of God was the principal mode of worship. The movement grew fast, firstly because of its simplicity but equally as a result of fostering the belief that all are equal as devotees. Soon, the entire Assam valley began to resound with *kirtans*, chants in the praise of God. The Hindus in every village began to gather for collective chant, called *kirtan*, and in the process the institution of *namghar* emerged as substitute of temple. These *namghars*, literally meaning the house where god is remembered, became a place of congregation. The Vaishnavism of Sankardeb attracted a large following and soon practically the entire Hindu fold adopted it, giving them a sense of belonging, creating a bond among the

members of this fraternity and working as a unifying force. Thus emerged a social order based on equality, belief in God, chanting of some prayers and observing similar festive occasions.

More than anything else, the scholarly followers of the faith created a corpus of literature that besides attracting large readership led the growth of Assamese literature. The devotional literature of the sixteenth century laid a solid foundation to the growth of Assamese literature in subsequent centuries.

2.4.2.3 Literature, Art and Culture in Medieval Assam

The most creditable aspect of Ahoms' rule was their sense of history and record keeping. The *Buranjis*, the books containing the record of events of the entire period of the Ahom rule in Assam, are unparalleled in the history of the world. Some of these, written in Assamese, add to the corpus of the Assamese literature. Till the close of the seventeenth century, the Ahoms had no pretensions, whatsoever, to any promotion of art and culture. On the contrary, religious reformers who were no mean literary geniuses, like Sankardeb, were persecuted and had to seek protection elsewhere. With the passage of time and the arrival of new kings through succession, the Ahom regime turned a bit more forgiving and indulging in creative pursuits. In the beginning of the eighteenth century, a number of masonry buildings in the environs of Sibsagar town including the royal palace (Photo 2.2), a sports pavilion commonly known as *ranghar* and a temple complex with several large tanks were built. These monuments dating from early to mid-eighteenth century have hardly any pretensions about the design and architectural style. The tanks developed by the Ahoms, using the sheer manpower of the paik system, are unique in their size. The formal conversion of the kings to Hinduism in the eighteenth century did not prove helpful to the growth of literature, as the religious beliefs of several of these kings being very narrow, inquisition of other faiths was more common than a liberal disposition toward the subjects. There were no human rights to be respected those days and kings were the absolute despots.

In contrast, the neighbouring kingdom of Kacharis with their capital at Dimapur had encouraged the growth of literature and adopted building practices and architectural style from Bengal. The ruins of Dimapur speak of the glory of Kachari kings. The development of Assamese language was perceived as a unifying force among the autochthonous rulers of Assam. The poet laureate Madhab Kandali produced an Assamese version of 'Ramayan', the ancient epic dating to first century A.D. Craftsmen and masons were imported from Bengal to introduce new style of housing and architecture.

The medieval period of Assam till the arrival of the British rule was marked by an exploiting feudal class, poor and helpless peasantry, universal slavery and a society perpetually in distress. The glory of the Ahoms was not reflected in the general living conditions of the masses who had to toil relentlessly for their survival. There were, nonetheless, an effusion of literary works and the growth of liberal Hindu institutions. The 150 years of liberal rule of the Koches (1515–1666), in the western

Photo 2.2 The residence of early Ahom kings close to Sibsagar town; the palace was built by Rajeshvar Simha in AD 1752 (Photo S. R. Jog)

part of Brahmaputra valley, liberated the creative spirit of the Assamese people. There was an efflorescence of devotional literature, largely promoted by the followers of Sankardeb, who had migrated to Barpeta to escape the persecution of the Ahom kings. The post-Sankardeb period, in the history of Assam, was marked by regional characteristics. While the eastern part, under the Ahoms, was groaning under their tyrannical rule, the western region under the liberal reign of Koch kings was bursting with creative energy, in the building of a dual purpose embankment-cum-road highway, on the northern bank of Brahmaputra from Cooch Bihar to Lakhimpur, and the rebuilding of Kamakhya temple, a religious work that had mass appeal (Photo 2.3). But, far more important was the social revolution that emanated from the teachings of Sankardeb and his disciples who emphasised the unity of God, considered animal sacrifice as a transgression of divine law and granted equal right and worship to all. The spread of devotional literature and establishment and growth of *satras*, a kind of monasteries, which formed the nucleus of diffusion of the Vaishnavite faith, imparted a sense of unity among the followers of this faith.

One may observe that while the immigrant ruling classes, the Ahoms from Myanmar, erstwhile Burma and the Muslim invaders from Bengal, practised their own faith, notwithstanding the fact that the Ahoms had changed to Hinduism in the late eighteenth century and were oblivious, if not outright hostile, to the belief

Photo 2.3 Kamakhya temple at Nilanchal Hills, Guwahati, the guardian deity of city (restored several times after destruction)

system of the local populace, the native rulers, the Koches and the Kacharis, rooted in the culture of the region, encouraged the growth of an Assamese identity based on a common language laced with common regional folklore and devotional literature, common religious practices, a common dietary habit and a common mode of living in response to physical environment.

The Vaishnavite movement of Sankardeb and the liberal rule of the Koches and Kacharis welded together an Assamese society with a distinct identity.

2.4.2.4 The Conflict Between Religion and State

The penultimate period of the Ahom rule was marked by religious intolerance and persecution of certain faiths that degenerated into a conflict between the state and religion, which through a series of events finally led to the fall of Ahoms. The overall partisan approach of Ahom kings in the beginning of the seventeenth century reflected, in a way, the conflict between traditional Brahmanism emphasising rituals and the devotional approach of Sankardeb, shorn of ritualism and solely expressed in prayers. The Ahom kings were influenced by the ritualistic Brahmans, particularly

the worshippers of Sakti, the energy, incarnated in Durga. The result was the persecution of devotees of 'Vishnu', known as Gosains, by certain Ahom kings. Starting with Gadadhar Singh (1681–1696), the process continued intermittently. Excessive continual persecution resulted in an organised revolt by the followers of one of this sect of Vaishnavism, known as Moamarias. Their revolt is known in the history of Assam as the 'Moamaria revolt'. They temporarily overthrew the Ahom king, installed their own representative on the throne and could be defeated only with the active intervention of the East India Company. The worsening of administration and the weakening hold of the kings led to a war of succession with each pretender seeking external help to install himself as the king.

2.5 The British Intervention and Subsequent Annexation of Assam in British Territory

The first arrival of the British in Assam was marked by the arrival of an expeditionary force in 1792 to assist the Ahom king Gaurinath, in uprooting the revolt of some nobles and restoring the authority of the king. This was not an incursion of foreign troops but the initiative of a peacekeeping force in response to the appeal of the king to the British authorities for help. After restoring order, putting Gaurinath, the Ahom king, on the throne at Rangpur and punishing the rebellious Moamarias, the expedition was withdrawn. It was a short engagement of the British troops with forces of insurrection, and there was no indication of any intention on the part of the British to occupy any territory. The occasion to interfere and enter into Assam presented itself once again, after some three decades when the Burmese occupied Assam and even raided the British territory.

Following intrigues in the royal camp, some disgruntled nobles approached the Burmese king for restoring their authority. The Burmese grabbed this opportunity and arrived in Assam in 1819. During the years that followed, they not only made the Ahom kings dance to their tunes, installed or deposed any noble or ruler at will but ransacked the entire Brahmaputra valley. They robbed the peasantry, plundered and burnt villages and even tortured the hapless villagers. Even bands of native marauders wandered in the countryside disguised as Assamese and persecuted the peasantry for petty gains. They did not remain confined to the valley but even intruded in the bordering Bengal territory, Cachar, and incurred the wrath of the British. An all-out war followed. After several battles in the Barak as well as in the Brahmaputra valley, the Burmese were not only defeated but thrown out of the Brahmaputra and Barak valleys and forced to leave Manipur, which they had occupied.

After a series of debacle, the king of Burma sued for peace and accepted the terms offered to him. In consequence, the famous treaty of Yandabo was signed on 24 February 1826. Thereafter, all hostilities ceased under the terms of the treaty; the Burmese were required among other things to abstain from all interference in the affairs of Assam and recognise Gambhir Singh as the Raja of Manipur.

2.5.1 Annexation of Assam in the British Territory

Following the eviction of the Burmese and a formal signing of treaty, the rajas of Cachar and Jaintia were again installed as rulers in their territories on the condition of allegiance to the British and the payment of an annual tribute to the company. The Brahmaputra valley, unlike Cachar and Jaintia, was ceded into the British province of Bengal and David Scott, the agent of the governor general of the East India Company, was appointed to administer the newly acquired area. Only the eastern extremity of the valley was left under the charge of Purandar Singh, a nominal king, on the condition of his paying an annual tribute of Rs. 50,000/-. The last king of the Ahom dynasty, however, did not continue long as he could not pay the annual tribute and was dethroned. The default, an easy excuse, led to the annexation of the last bit of the territorial possession of the Ahom kings into the British province of Assam in 1838, signalling an end of the 600 years of Ahom rule in Assam. The other smaller areas of Assam that were not immediately occupied after 1826 treaty of Yandabo, besides the tract left under the rule of Purandar Singh, were the Sadiya region and the Matak country, the former under the care of Sadiya Gosain and the latter under the protection of Bar Senapati. Following frequent conflicts with the Khamptis and apparent administrative infirmity, the tracts were also merged into the British territory by a proclamation in 1842, merging these areas into Lakhimpur district.

2.5.2 The Expansion of the British Territory

While talking of the annexation of Assam into British territory, note has to be taken of the fact that Goalpara and Sylhet districts including a part of Garo Hills, which formed part of the province of Bengal, were transferred to the East India Company in 1765, under the order of the Moghul emperor. Thus, part of late eighteenth century Assam was already under British possession before the annexation of the Ahoms' kingdom. After the occupation of the Brahmaputra valley, the British turned their attention to linking the two valleys, viz. Brahmaputra and Surma (Barak), by an all-weather road. The construction of the road, through the Khasi territory (now Meghalaya), created friction with the local chiefs. Hostilities broke out, the Khasis who offered fierce resistance under their leader Tirot Singh had to concede defeat and accepted the authority of the British (1833). And, though they managed to retain their chiefships, they were treated as vassals to the British Government and had to live under the general control of the political agent of the British. In the process, the most notable chief of the Khasis, Tirot Singh, was incarcerated and exiled to Dacca. The Cachar kingdom was annexed into the British territory (1832) after the death of its ruler Raja Gobind Chandra, the latter having died without any descendent. It was not that a legal heir could not have been found, but it was a pre-planned strategy of the British. Cachar, after its annexation, remained for several years a part of Dacca division and thus a district of Bengal. The northern part of Cachar under the control of Tularam Senapati was also

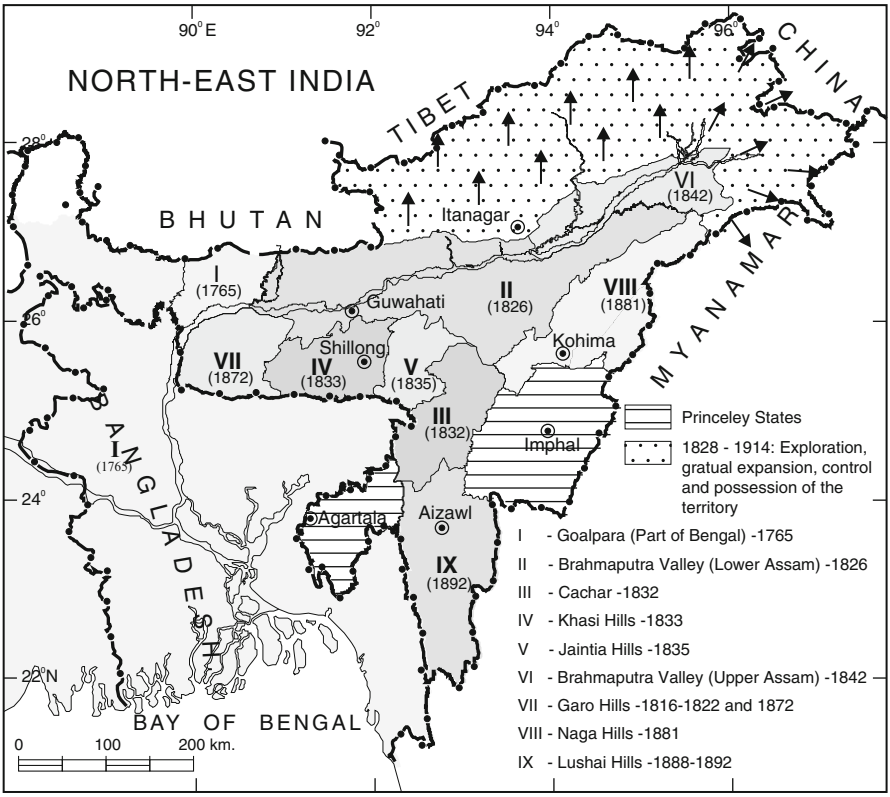

Fig. 2.3 Chronology of the expansion of the British Rule in North-East India (Adapted from Joppen 1914; Mackenzie 1884)

subsequently annexed. In 1835, the Jaintia territory was annexed into the British territory by a simple proclamation, under the pretext that the Raja failed to return the fugitives who had committed crimes in the British territory. The Raja was retired on a measly pension of Rs. 500/- per month. The 'Duar' region of Assam, bordering Bhutan and lying in Kamrup and Darrang districts, was freed from the control of the Bhutias in 1872, and fresh arrangements were made after demarcating the boundary line between Bhutan and British territory, from Manas river on the west up to Deosham river in the east (Fig. 2.3).

2.5.2.1 The Annexation of the Naga Hills Area

The first contact with the Naga Hills was established in 1832, when Capt. Jenkins, Capt. Pemberton and Capt. Gordon were deputed to explore a route through their country with a view to opening out a direct communication

between Assam and Manipur. The expedition by Capt. Pemberton and Capt. Jenkins was opposed with the most determined resistance at every village they passed through, and so bitter was the opposition that in many instances the villagers set their own villages on fire in order to destroy the provisions (Butler 1875:310). During the 45 years, the political history of Naga Hills was 'one of long sickening story of open insults and defiance, bold outrages and cold blooded murders on one side, and long suffering forbearance, forgiveness'. The main opposition to any British advance in the Naga territory came initially from the Angamis who inhabit the southern part of Naga Hills around Kohima. After several encounters between the forces of the East India Company and the Angamis, the latter finally accepted the authority of the British in 1880. The final decision to make Naga Hills a British district was taken in 1881 (Reid 1942:99), and Naga Hills was made a district of Assam, with an area of 6,400 sq. miles and a population of 94,380.

2.5.2.2 Annexation of the Lushai Hills

Whatever information one has about the expansion of the British territory in North-East India comes from the British sources – the writings of Mackenzie, Shakespear and Reid.[5] The expeditions of the East India Company are always shown retaliatory, in response to unwarranted raid of the hilly tribes. In one such raid by the Lushais in Cachar and even Chittagong Hills, in 1888, Lt. J. F. Stewart, leading a survey party, was killed. This prompted retaliation, and the British mounted a number of expeditions in 1889 and 1890 and established a permanent post on Aijal range. Following a number of operations, 'Lushai Hills' were captured and occupied by the company in 1890. The administration of the area started with the creation of two districts, North Lushai Hills and South Lushai Hills, with headquarters at Aijal (Aizawl) and Lunglei, respectively. While North Lushai Hills became part of Assam, South Lushai district was attached to Bengal. Even after setting up of administration, there were revolts but these were suppressed. The Census of Assam 1891 mentions North Lushai Hills as a district of the state. Before long, however, both the districts were united to form Lushai Hills district as the new district of Assam.

2.5.2.3 Extension of Control over the Duars

Early in the British rule of Assam, the problem of Bhutan Duars (the gateway to the hills) was settled by annexing an area of 1,600 sq. miles in 1841, against an annual payment of Rs. 10,000/- to Bhutan Government. Following this and some subsequent agreements, the boundary between Bhutan and Assam was fixed in

[5] The writings of these three authorities form three of the four basic texts suggested in the beginning of this chapter.

1872–1873. East of Bhutan, Kariapara Duar was also acquired from 'Sathrajas', subordinates of Tawang raja, a tributary to Lassa (Mackenzie 2005:16), on payment of Rs. 5,000/- per year. Thus, the frontiers with Bhutan and partly with extra Bhutan region with Assam were secured giving the British a permanent foothold, preventing illegal incursion from the north and benefitting from border trade, particularly in well-established fairs at Dewangiri and Kariapar.

2.5.3 Grappling with the Northern Frontiers

Early in their occupation of Assam, British had no idea of controlling and administering the area now known as Arunachal Pradesh. The territory, north of Assam, was a vast expanse of hilly area, inhabited by tribes who occasionally raided the villages down south in the Brahmaputra plain, ransacked them, looted property and abducted a few persons to work as slaves for them.

The tribal communities inhabiting the forested and badly dissected terrain, varied in their language, customs and social behaviour, though they were all mongoloid in their ethnic make-up. A difficult terrain, which was divided into blocks by deeply entrenched valleys, made intergroup communication difficult, giving rise to independent tribes. The principal groups, which were a perpetual headache to the Ahoms and subsequently to the British administration, were the Akas, Daflas and Apatanang on the west and Abors, Mishmis, Khamptis and Singphos on the east.

2.5.3.1 The Establishment of the Inner Line

In 1873, the Inner Line Regulations were extended to Assam and accordingly the Lt. governor prescribed an Inner Line, delineating the limit beyond which 'no British subject of certain classes or foreign residents can pass without a license'. The pass or licence was subject to certain conditions. 'Rules were also laid down regarding trade, the possession of land beyond the line, and other matters, which gave the Executive Government an effective control' (Mackenzie ibid.:55). In case of the Northern frontiers, the British had fixed another line, known as the 'Outer Line'. In one of the dispatches addressed to the Viceroy in 1910, the following clarification is offered about the significance of the 'Inner' and 'Outer Line': 'We have an inner and an outer line, up to the inner line we administer in the ordinary way. Between the inner and the outer line, we only administer politically. That is, our political officer exercises a very loose jurisdiction, and to prevent trouble with frontier tribes, passes are required for our subjects who want to cross the inner line. The country between the two lines is very sparsely inhabited and is mostly dense jungle' (Reid 1942:221).

Indeed, the British exercised only a loose jurisdiction on the Frontier Areas meant to prevent the aggressive incursion of the warring tribes. For exercising control, the entire northern frontier was divided into two divisions in 1912,

initially known as 'Central and Eastern Section, North-East Frontier' in the eastern and 'Western Section, North-East Frontier' in the western part of what is Arunachal Pradesh today. These were later changed to 'Sadiya Frontier Tract' with headquarters at Sadiya and 'Balipara Frontier Tract' having its headquarters at Balipara. For each of these frontier tracts, an assistant political officer was appointed to manage the affairs of the frontier areas, under the overall control of the deputy commissioner of the respective district. The main function of these frontier headquarters was to prevent the wild tribes from any unauthorised entry or attack on the British territory and to retaliate and punish them in case of any attempt at thieving or kidnapping people from the plains. Thus, both in the Balipara as well as Sadiya frontiers, a number of expeditions were undertaken in different segments to punish the offending individuals and the tribes. In Balipara segment, the Akas, Daflas and Apa Tanangs (Apatanis) were the main tribes that required occasional retribution, while on the eastern sector Abors, Mishmis, Singphos and Khamtis were the main tribes. Of these, Abors and Mishmis were most troublesome. The Aka Expedition of 1883–1884, the Apa Tanang Expedition of 1897, the Miri Mission of 1911 and the visit to Tawang of 1914 are the principal expeditions in the western sector. Some of these expeditions, besides being punitive were also exploratory with survey parties. The last of these was led by Capt. Neville who travelled to Tawang in April 1914 and submitted a very authentic account of this region to the government.

On the eastern side, a route to Rima, beyond the assumed border of the state, was opened. But the Abor Expedition of 1893–1894, the Mishmi Expedition of 1899–1900 and another Abor Expedition of 1911–1912 were also exploratory. In fact, a great deal of survey work was completed in these expeditions, besides meeting out punishment to the hostile tribes. The most important expeditions, however, was the Dibong Survey and exploratory expedition of 1912–1913. The expedition led by Capt. G. A. Nelville included 315 military police, 52 survey personnel, over 1,000 coolies and 10 British officers. It may be mentioned that Capt. F. M. Bailey was part of this expedition. While good work was done during this, an offshoot of this was the subsequent expedition undertaken by Capt. F. M. Bailey, who started off on a fresh expedition after the Dibong Valley Expedition and completed the survey of Himalayan watershed with Capt. Morshead (Bailey 1914:341–364).

2.5.3.2 The Survey of the Himalayan Frontiers

Though some survey work was done by earlier explorers in bits and pieces, these reports could not be integrated. They include those by Pundit Nain Singh (1864) and Pundit A. K. (1882) besides Kurthup (1884), the last being quite courageous though illiterate. The daunting task of surveying the Himalayan frontiers south of Tibet was undertaken by Capt. F. M. Bailey (1914) with Capt. Morshead of Survey of India. The expedition started on May 16, 1913 from Mepi, a place in the upper reaches of river Dibong, and ended after 6 months when the party reached Rangia on November

1913. It may be mentioned that the western part of Tibet was explored by Major C. H. D. Ryder (1905:369–395).

Simla Conference (1914) and McMahon Line, the Indo-Tibet Boundary

The details of the boundary line that formed the basis of the map showing the boundary between India and Tibet during the Simla Conference were produced by Capt. Bailey and Capt. Morshead. The Simla Conference of 1914 resulted in the delineation of the Indo-Tibetan frontier, from the India–Bhutan–Tibet trijunction to the Izu Razi pass on the Irrawaddy–Salween water parting. The establishment of the Indo-Tibet boundary also determined the boundary and the area of today's Arunachal Pradesh.

Appearance of Frontier Area as British Territory

Till 1912, there was no official recognition of any frontier area being a part of the British territory, though the tribal groups and areas were treated under British protection. For the first time, the frontier tract acquired official recognition in 1912. Thus, Sadiya Frontier Tract and Balipara Frontier Tract appeared for the first time as a part of British territory in 1921. In 1921, the combined area of Balipara and Sadiya Frontier Tracts under an organised British administration was just 900 sq. miles, which increased to 3,760 sq. miles in 1931 and 3,810 in 1941. There is no doubt that the much larger area of the frontier was under the control and possession of the British, but as it is evident from the census records, effective administration was limited to a much smaller area. The situation did not change much even after 1947, and the Census of Assam from 1951 shows the Balipara and Sadiya frontiers as parts of Assam Hill division with an area of 14,159 sq. miles. After independence, these frontiers were made a Union Territory of Government of India and named North-East Frontier Agency. A change of name was further effected in 1971, when under the North-Eastern Areas (Reorganisation) Act it came to be known as Arunachal Pradesh with five districts. It became a full-fledged state in 1987 with nine districts.

The sequence of events that led to the acquisition and gradual annexation of the territory under the British rule is as follows (Table 2.2).

By the beginning of the twentieth century, British occupation of the North-East was almost complete, yet the territory between the British possession of Assam and the Himalayan heights, coinciding with present-day Arunachal Pradesh, was not under their control. The process of extension of the British rule in this tribal territory was difficult. Starting with the appeasement of the tribal communities, some of whom were very wild and fierce, in the form of the annual payment, *Posa*, initially introduced by the Ahom kings, to sending punitive expeditions, explorations and survey of the entire frontier took almost 75 years. By 1914, the British were in control of the entire territory between Brahmaputra and the Himalayas.

Table 2.2 The annexation of the territory by the British, in sequential order

Year	Territory or district acquired	Associated events
1769	Goalpara, part of Garo Hills and Sylhet district	These were acquired following the treaty with the Nawabs of Bengal under which the British secured the Diwani rights
1826	Districts of Kamrup, Darrang and Nowgong	Following the defeat of the Burmese and signing of the Yandabo treaty in 1826, the British took possession of the entire territory that was ruled by the Ahoms and their vassals. 1. The lower Brahmaputra was annexed in the British territory, and a small part of upper Assam was allowed to be ruled by Purandar Singh, the last Ahom scion on an annual payment of Rs. 50,000/- under the treaty of 1835 2. Sadiya and the country to the south known as Matak, both in the extreme eastern part, were allowed to be retained by the chiefs of those regions to be ruled as British province. Matak to be looked after by Bar Senapati and Sadiya to be administered by Sadiya Khowa Gohain
1832	Annexation of Cachar	Raja Gobind Chand, the Raja of Cachar, died without any heir
1835	Annexation of Jaintia	Disobedience of the Raja of Jaintia who was turning ambitious to expand the area under their rule
1833	Khasi estates	Following a dispute over laying a road to join Sylhet with Gauhati via Nongkhlaw, a war broke out, and finally, the leader of the Khasis, Tirot Singh, was arrested. The Khasis submitted, and they had to accept the sovereignty of the British
1838	The districts of Lakhimpur and Sibsagar	The last Ahom king could not pay the annual tribute of Rs. 50,000/- and was dispossessed
1842	Matak country and Sadiya	The area was annexed by a simple declaration
1841, 42, & 1843	The Duars to Bhutan, including Kariapar	Were taken by the British on variable annual payments. For Kariapar the payment was Rs. 5,000/- annually
1869 1871 1872	Garo Hills	Earlier, Garo Hills were treated as a part of Goalpara district. In 1869 a separate district of Garo Hills was formed with Tura as its headquarters
1881	Naga Hills	After a series of skirmishes and political manoeuvres, Naga Hills was made part of British territory. It was a gradual extension of authority from one part to another
1891	Lushai Hills	In reprisal of several raids by Lushais, their territory, Lushai Hills, now known as Mizoram was captured.

2.5.4 *Territorial Organisation During 120 Years of British Rule*

'The province of Assam was constituted in the year 1874–1875 when the eleven districts comprising it were separated from the Lt.-Governorship of Bengal, and established as an independent administration under a chief commissioner' (Mackenzie 1979:537). These districts were administered by commissioners who were subordinate to the chief commissioner having his headquarters at Gauhati. The Surma valley districts of Cachar and Sylhet were under the direct administration of the chief commissioner; the hill districts like Naga Hills, Garo Hills and North Cachar Hills were administered under special rules.

'Goalpara, including Garo Hills but excluding the earlier Duars, was originally administered from Rangpur and, as such, formed part of the province of Bengal which by the Mughol emperor's farman of 12th August 1765, was transferred to the East India Company. Under the provisions of the Regulation X of 1822, it was cut from Rangpur and formed into a separate district with headquarters at Goalpara. When David Scott was entrusted with the administration of the tract taken from the Burmese, he was already in charge of Goalpara; and from that time the district was treated as part of ordinary jurisdiction of the commissioner of Assam. In 1867, when the Bengal commissionership of Koch Bihar was formed, it, with the newly acquired 'Eastern Duars' was included in that commissionership' (Gait op. cit.:284). Yet, for all practical purpose, the district remained a part of Assam. It must be mentioned that from 1838 to 1874, Assam was a nonregulation province of the British Empire (Mackenzie 1979:6) and was governed by a set of rules known as 'Assam code' drawn in 1837, but local officers were directed to conform, as nearly as the circumstances would permit, to provision of Bengal regulation.

The territorial organisation and administrative boundaries of the state and even districts, during the period of British rule were relatively stable with very few changes. One major event was the clubbing of the province of Assam with east Bengal and consequent creation of the 'State of East Bengal and Assam' in 1905, which lasted till 1912 before the province of Assam was again separated from the larger unit, to regain its original status as a separate province. The earliest mention of the districts of the province is found in Robinson's *Descriptive Account of Assam*, published in 1841. He talks of six districts of Assam, viz. Kamrup, Durrung, Nowgong, Shibpur, Lakhimpur, Muttuk and Sadiya. He has omitted Goalpara, which was then treated as part of Bengal. In 1872–1873, immediately after the state being given the status of a full-fledged state, Assam had 13 districts given in Table 2.3.

As can be seen from Table 2.3, there is virtually no change in the territorial organisation of Assam over a period of seven decades, between 1874 when Assam was constituted into a regular state under a chief commissioner and 1947, the year of India's independence and the transfer of power from the British to the Union of India. Besides the British held territory, there existed and even continue to exist even today the two princely states, viz. Manipur and Tripura. While Manipur was under the supervision of the chief commissioner of Assam, Tripura, known as Hill Tipperah till 1921, was a feudatory of the Lower Province of Bengal.

Table 2.3 Administrative division of Assam (districts) during the British rule[a]

1872–1873[b]	1881[c]	1901[d]	1941[e]
1. Sylhet	1. Sylhet	1. Sylhet	1. Sylhet
2. Cachar plains	2. Cachar plains	2. Cachar plains	2. Cachar
3. Kamrup	3. North Cachar Hills	3. Goalpara	3. Goalpara
4. Durrung	4. Goalpara	4. Kamrup	4. Kamrup
5. Nowgong	5. Kamrup	5. Darrang	5. Darrang
6. Sibsagar	6. Darrang	6. Nowgong	6. Nowgong
7. Luckimpoor	7. Nowgong	7. Sibsagar	7. Sibsagar
8. Luckimpoor Hills	8. Sibsagar	8. Lakhimpur	8. Lakhimpur
9. Cossya and Jyntea Hills	9. Lakhimpur	9. Lushai Hills	9. Lushai Hills
10. Goalpara	10. Garo Hills plains	10. North Cachar	10. Naga Hills
11. Garo Hills	11. Naga Hills	11. Naga Hills	11. Khasi & Jaintia Hills (British)
	12. Khasi and Jaintia Hills	12. Khasi and Jaintia Hills	12. Garo Hills
	13. Garo Hills	13. Garo Hills	
			Sadiya Frontier
			Balipara Frontier
Total area			
53,856 sq. miles	46,341 sq. miles	52,959 sq. miles	54,951 sq. miles

[a]The district names are spelled as given in the census of specific years and may not conform to the present spelling
[b]Memorandum of Census of British India, Her Majesty's Stationary Office 1817–1872 (1875:44)
[c]Superintendent Government Printing Press (1883:22)
[d]Allen (1902)
[e]Census of India (1941b:2)

Some of the territorial changes that were effected progressively had a nebulous structure. This was the case with the North-East Frontiers divided into Sadiya Frontier Tract on the east, instituted in 1912, and Balipara Frontier Tract on the west. The areas were administered by officers, designated as assistant political officers. Their function was not so much administration as keeping a watch on the tribes ranging from Akas and Daflas in the west to Abors, Mishmis and Shingphos in the east. The idea was to protect the British territory from the frequent attacks of these tribes who frequently descended on to the Brahmaputra plain and took away cattle and young persons to be employed as slaves. A number of punitive, exploratory and survey expeditions were mounted from these stations to the hilly areas. At what stage did the British Government decide to annex the frontier areas in Assam is not quite clear: what is certain is that once they had surveyed the entire area south of the Himalayan watershed, sometime in 1912, they established a claim on the entire frontier area, now known as Arunachal Pradesh, and gave it a legitimacy in the Tripartite Simla Conference of 1914. It was only after 1914 that the Survey of India produced maps that showed the entire North-East Frontier Area as part of the British India, though there was no division among administrative units, no proper governance and no development.

The frontier districts of Sadiya and Balipara appeared in the census records for the first time in 1921 and that too in a very muted way. It is only in 1931 that there is a clear mention of Sadiya and Balipara Frontier Tracts, and only in the introductory part is it stated that 'the total mapped Areas of Sadiya and Balipara Frontier Tracts amounts to 18,473 and 9,537 sq. miles respectively', thus bringing the total surveyed area of North-East Frontiers to 28,010 sq. miles, which was raised to 32,077 sq. miles (83,047 km^2) in 1941.

There were no significant changes in the territorial organisation of Assam between 1901 and 1947. Some minor changes included the enlargement of hill districts of Naga Hills and Lushai Hills. In 1921, a small area of Tripperah Hills was transferred to Sylhet district. There were some interdistrict transfers of areas between Goalpara, Kamrup, Nowgong, Sibsagar, Lakhimpur and Naga Hills. Between 1921 and 1931, some un-administered territory in Naga Hills district was added to the district. Thus, between 1921 and 1931 an area of 908 sq. miles with a population of 15,711 was added to the province of Assam. North Cachar Hills was merged into Cachar in 1821. Till 1911, Cachar plains and North Cachar existed as two separate districts. The district of 'Khasi and Jaintia Hills' that existed as a single district till 1921, with an area of 6,022 sq. miles, was split into two districts in 1931, separating the British part of Khasi and Jaintia Hills from the Khasi states and replacing the single district with two districts, viz. Khasi and Jaintia Hills (British), and 'Khasi Estates'.

In 1941, the last census conducted during the British rule, the province of Assam had an area of 67,359 sq. miles that included Manipur state (8,620 sq. miles) and Khasi state (3,788 sq. miles). The British territory of Assam was 54,951 sq. miles with 13 districts, excluding the states, but including the administered areas of Sadiya and Balipara frontiers.

Before 1947, Assam was as monolithic state with an area of 70,853 sq. miles (183,438 km^2) excluding over 80,000 km^2 area of North-East Frontiers.

2.5.5 Socio-Economic Condition of the Assamese Society During the British Rule

The end of the Ahom rule and the beginning of the British administration heralded a new era in the socio-economic history of Assam. In the evaluation of the social condition of the people, the reforms introduced by the British Government, which led to betterment of the society, could be delinked from their economic policy, which is often viewed as an instrument of exploitation and a means to promote the colonial interests.

The first act of the British Government was to abolish the age-old *paik* system and with that was also abolished the social distinction between the three classes of subjects, viz. *kadi-paik, chamua paik and visaya.* Slavery as an established social institution was outlawed, and with that the slaves (*Bandi beti),* bonded labour (*Bandha*) and assigned labourers (*Likchon*) were emancipated (Sarma 1981). These reforms were very liberating in nature and uplifted the spirit of the masses imparting a sense of equality. Another significant change was the introduction of a *ryotwari*

system, under which the peasants were required to pay land rent directly to the government without an intermediary, though there were collecting agents like *Chaudhuries* and *Mauzdars,* assisted by *Patwaris* or *Kakatis*. This had adverse impact on the big landlords and the nobles (Dangariyas/visayas), as they were deprived of the services of the slaves and the bonded labour, who, though poorly paid, were the backbone of agriculture. Thus, many of the landlords were forced to sell their land. This initiated the emergence of a middle class in Assam.

The most significant contribution of the British rule, however, was the promotion of Assamese language and literature. In fact, modern age in Assamese literature starts from the beginning of the nineteenth century, with the publication of New Testament in Assamese in 1813, by the Baptist mission press in Serampore. It was translated by one Atma Ram Sarma of Nowgong (Barua 1965). A new landmark was created by the arrival of two missionaries, Rev. N. Brown and O. T. Cotter, in 1836 in Sibsagar, where they set up a press and started a school for imparting English education within 3 months of their arrival. What is significant, however, is that they wholeheartedly advocated the use of Assamese in place of English in schools and courts. One of the missionaries at Sibsagar, A. H. Danforth, wrote in 1853: 'We might as well think of creating a love of knowledge in the mind of a stupid English boy by attempting to teach him French before he knew anything of the rudiments of English' (quoted from Hem Barua 1965). This was a turning point in the revival of Assamese language which was suppressed by the introduction of Bengali in Assam, as the medium of instruction in schools and as the language of the courts. The missionaries, led by Dr. and Ms. Brown, produced a good deal of secular instructional material, like books on arithmetic and geography. But, the singular contribution for which the Assamese missionaries are remembered is the publication of a monthly journal called *Oronodoi* (1845–1886) in Assamese, which, to quote Hem Barua (1965), was the mouthpiece of the Baptist Society in Assam and an oriental replica of The Illustrated London News newspaper. The American Baptist mission not only gave the language of the people a fresh lease of life but also gave its due share of justice and recognition in all institutions. This opened the floodgate of publications in Assamese language. Inspired by the love of his mother tongue and supported by the Baptist mission, it was Anandaram Dhekial Phukan, an educated and patriotic Assamese, who pioneered the movement for the revival of Assamese language and through the mediation of A. J. Moffat Mills, Judge of Sadar Diwani, Calcutta, succeeded in convincing the government to adopt Assamese as a court language and as the medium of instruction in schools, in place of Bengali.

On the economic front, agricultural productivity increased during the colonial period, despite the burden of rent, firstly because of the reclamation of more land, but in no less measure because of the elimination of middle men following the introduction of the *ryotwari* system that increased the number of self-employed peasant proprietors who accounted for almost 90 % of the entire agricultural class (Guha 1979:23). The introduction of new crops like potatoes, pineapples and chillies was a novel feature of Assamese agriculture. Many of these reforms like the abolition of slavery and the introduction of ryotwari pale into insignificance when seen against the background of the hardships the peasants had to face as a consequence of the

monetisation of the economy and a progressive enhancement of rent. 'The monetization of the economy put the Assamese peasantry under severe strain, since the marketing of the farm output remained difficult well until the mid-nineteenth century. Peasants had to sell a considerable part of their output to meet the revenue demand, while their consumption oriented petty mode of production persisted' (Guha ibid:3). There was no permanent settlement and the peasants were granted only short-term leases, often for 10 years. There was always a lurking fear in the minds of the peasants of being dispossessed of their land in the next settlement. Only the religious institutions had the proprietary rights on land that was held rent-free, locally known as *lakhiraj*. Added to this woe was the frequent increase in the rent of land, a 'trend that continued throughout the nineteenth century even though there was hardly any corresponding improvement in the overall paying capacity of the people' (Goswami 2007). Within a time span of 25 years, the revenue demand increased fourfold. The accent, always, was higher collection of revenue. This stood in sharp contrast to the concessions extended to the European tea planters who owned about one-fourth of the total settled area of Assam of which more than half (55 %) was perpetually revenue-free (Guha 1979).

The poverty of the peasants led to the emergence of a number of *Ryot Sabhas* or peasants associations in many districts. Their activities generated a kind of resistance movement and occasional revolts. The cause of the peasantry was finally taken up by Anandaram Dhekial Phukan (1829–1859), a young Assamese, educated in Hindu College, Calcutta, in the service of the Assamese Government. He pleaded for a *ryotwari* system with proprietary rights to the peasants and insisted on a period of 25 years for the leases. The petition to A. J. Moffat Mills, judge of *Sadar Diwani*, Calcutta, brought forth in the last quarter of the nineteenth century some reforms, which offered some relief to the peasants.

A divergent view of British rule in Assam, or for that matter the whole of India, is that of the colonialists who ruled the country with a view to exploit its resources to feed the British industries and market their finished products in India. The laying down of railways in the Assam and linking the province with the port city of Chittagong, exploration of petroleum in the upper Brahmaputra valley and the introduction of steamer navigation in Brahmaputra are all perceived as a part of colonial strategy to exploit the local resources. The spread of modern education, including science, engineering and medicine; a system of judiciary based on laws that did away with arbitrary and subjective decisions; and a streamlined administration are often seen through an ideological prism. The truth lies, however, somewhere in the middle. There are several things like the introduction of wheeled transport in Assam, establishment of a number of educational institutions, like the Cotton College at Guwahati and St. Edmond's at Shillong, and linking of the Brahmaputra and Barak valley by a road speak for the British enterprise. At the same time, the capital invested by them, either in tea plantations, petroleum exploration or laying down the transport lines, is undeniably guided by their trading interests.

The most exploitative mechanism that the British created was the introduction of large-scale tea plantations, owned by British planters but worked by the backbreaking hardwork of Indian labour recruited from Bengal, Bihar and other parts of India.

The plantations were encouraged by the grant of revenue-free land, and in any situation of labour trouble, the planters had always the support of the government. The contrast in the personal and community lifestyle of tea planters, complete with their club, tennis courts and swimming pools, all linked with the main towns by metalled roads, and that of the poverty-stricken peasantry living in thatched houses, under unhygienic conditions, gave the semblance of 'Planters Raj', a term borrowed from the celebrated work of Amalendu Guha (1977) 'Planters Raj to Swaraj'.

The hilly peripheral areas of British Assam, especially the Naga Hills and Lushai Hills districts, (now Nagaland and Mizoram states of Indian Union) were administered with minimum intervention, except when there was a law and order problem or a revolt against the administration. The space left by the administration was filled up by the missionaries, the American Baptists in Nagaland and Welsh Presbyterians in Mizoram. The achievements of these Christian organisations can be seen in an almost complete proselytisation of the tribal population and a high degree of literacy and awareness in these states.

2.5.5.1 The Struggle for Freedom

The British rule in Assam lasted for 120 years (1828–1947), starting with the end of the Ahom dynasty (1828) and ended with the independence of India. During the struggle for freedom of India, which, led by Mahatma Gandhi (M. K. Gandhi 1869–1947), lasted for four decades, Assam joined the rest of India. The freedom movement in Assam was as active as in other parts of the country. Whether it was the boycott of foreign goods, civil disobedience or Quit India Movement (1942), Assam participated in the freedom struggle actively and in the process had to suffer deaths and destruction. Some of the immortal events in the freedom struggle of Assam are represented by the martyrdom of Kanaklata who braved the bullet at Gohpur while hoisting the national flag or the courage of a 15-year-old girl, Ratna Phookan, who showed extraordinary courage in keeping aloft the national flag in the face of heavy police firing. A lot of people died and a still higher number were injured in the movement.

The dawn of independence kept the people of Assam in suspense for some time, in view of a proposition to transfer the entire state Assam with East Bengal, now Bangladesh, to Pakistan. Finally, only the Sylhet district of Assam, with a majority of Muslim population, was divided and a major part of its area merged into East Pakistan, and a small eastern part, with the dominance of Hindu population, remained in Assam.

2.6 Territorial Reorganisation of North-East India After 1947

The changes witnessed in the North-Eastern region were, in the first place, a fall out of the partition and exchange of territory between two neighbouring states, India and Pakistan, on the basis of religion. In the case of Assam, the Boundary

Commission headed by Sir Cyril Radcliffe effected a major change. Sylhet, the most populous and fertile district of the state, located in Surma valley, was transferred to East Pakistan (now Bangladesh). Only an area of 709 sq. miles (1,835.6 km^2) consisting of the thanas of Badarpur (47 sq. miles/121.7 km^2), Ratabari (240 sq. miles/621.36 km^2), Patharkandi (227 sq. miles) and a portion of Karimganj thana (145 sq. miles/375 km^2) remained with India. These areas were put together under a separate subdivision under Cachar district. The Barak valley, in 1951, had only one district, i.e. Cachar with an area of 6,970 km^2. Presently Cachar is split into three districts, i.e. Cachar, Karimganj and Hailakandi.

Internal changes in 1951 included doing away with the 'Khasi states' as a separate district and their replacement as a single large district called 'United Khasi and Jaintia Hills'. In November 1951, a new district called 'United Mikir and North Cachar Hills district' was formed by clubbing together North Cachar subdivision of Cachar district with Mikir Hills. It may be mentioned here that the United Mikir and North Cachar Hills district was, after two decades, again bifurcated into Mikir Hills district and North Cachar district. The three newly created districts of Mishmi Hills, Abor Hills and Sadiya Frontier Tract were added into Assam in 1948. To be able to manage larger and hitherto ungoverned area Tirap Frontier Tract and Naga Tribal Areas were also added in Assam bringing the total area of Assam in 1951 to 85,012 sq. miles (2,20,096 km^2) (Census of India 1951:5).

2.6.1 Birth of Nagaland

In 1963, Naga Hills district of Assam was changed into Nagaland state. In 1957, Naga Hills and Tuensang were declared areas administered by Indian Union, and this union territory was given statehood and renamed Nagaland under the 'State of Nagaland Act 1962'. This comprised the earlier Naga Hills district with an area of 4,237 sq. miles (10,967 km^2) and an additional area of 2,000 km^2 of Tuensang Frontier division which had remained as 'un-administered area' till 1948. On the eve of the formation of Nagaland state, it was divided into three districts, viz. Kohima, Mokokchung and Tuensang districts.[6]

Another loss of area to Assam was the transfer of 32.8 sq. miles of the area of Kamrup district and ceded to the Government of Bhutan on 1 September 1951.[7]

2.6.2 Emergence of Meghalaya as a State and Mizoram as a Union Territory

After Naga Hills the Khasi and Jaintia Hills also seceded from Assam in 1971. Under the Assam Reorganisation (Meghalaya) Act, 1969, the autonomous state of

[6] For details see Census of India (1961a).

[7] Ibid p. 16.

Table 2.4 The frontier divisions and headquarters of NEFA 1954

	Divisions	Headquarters
1.	Kameng Frontier Division	Bomdi-la
2.	Subansiri Frontier Division	Ziro
3.	Siang Frontier Division	Along
4.	Lohit Frontier Division	Tezu
5.	Tirap Frontier Division	Khela (later shifted to Khonsa)
6.	Tuensang Frontier Division	Tuensang

Meghalaya was formed within the state of Assam, comprising 'United Khasi and Jaintia Hills district and the Garo Hills district'. A portion of Shillong town, namely, European ward, Police Bazar ward and Jailroad ward and Shillong Cantonment remained with Assam. Subsequently under the North-Eastern Area (Reorganisation) Act 1971 (Act No. 81 of 1971) of Parliament, the State of Meghalaya was formed comprising the area that was part of the earlier autonomous State of Meghalaya. Under the same act, the Union Mizo Hills district of Assam acquired the status of a union territory known as 'Union Territory of Mizoram'. The new state of Meghalaya and the Union Territory of Mizoram came into existence on 21 January 1972 and ceased to be parts of the state of Assam.

2.6.3 North-East Frontier Agency and Arunachal Pradesh[8]

For decades, the area of North-East Frontiers was divided into a number of frontier tracts like Balipara Frontier Tract, Sadiya Frontier Tract and Lakhimpur Frontier Tract. In 1954, under the North-East Frontier Areas (Administration) Regulation, 1954, readjustment and redesignation of the administrative units were made and the entire North-East Frontier Area was designated as 'North-East Frontier Agency', made a union territory and divided into frontier divisions, which were equivalent to districts (Table 2.4). These were from west to east.

In 1957, under another act 'Naga Hills–Tuensang Area Act 1957', the Tuensang Frontier Division was transferred from NEFA to the new administrative unit called 'Naga Hills–Tuensang Area'.

Thus, in 1961, NEFA had an area of 31,438 sq. miles (81,424 km^2) having a total population of 336,558, distributed over five frontier divisions (Kameng, Subansiri, Siang, Lohit and Tirap). The Union Territory of NEFA was renamed as Arunachal Pradesh under the North-Eastern Areas (Reorganisation) Act 1971. Arunachal Pradesh initially had five districts, the same as in NEFA, but their number multiplied by dividing the districts. Thus, the number of districts in Arunachal Pradesh increased from 5 districts in 1961 to 9 in 1981, 11 in 1991 and 13 in 2001. Arunachal Pradesh acquired the status of a full-fledged state on 20 February 1987.

[8] For details see Census of India (1961b).

2.6.4 The Merger of Tripura in Indian Territory

The princely state of Tripura, a feudatory state of Bengal, earlier known as Hill Tipperah, was a princely state till 14 October 1949. It was merged into Indian Union and became a Part-C State, under the Government of India. Further, under the North-Eastern Areas (Reorganisation) Act 1971, the status of Tripura was changed from Part-C State to a full-fledged state, on 21 January 1972.

2.6.5 Changes in Princely State of Manipur and Its Merger with India

The state of Manipur has a long history and has witnessed besides glorious rule of kings many good and bad events like frequent palace intrigues, fratricides and coups, occupation by the Burmese and their eviction with the help of the British and finally its merger into the Indian Union. The last event opened the door to British intervention in the affairs of the state. A revolt of the king and his nobility against the British in 1891 led to the reduction of the state to a virtual protectorate of the British. After independence, Manipur merged into the Indian Union in 1949, following a merger agreement signed by Maharaja Budhachandra, the king of Manipur, with the Government of India on 21 September 1949, at Shillong. The state remained an independent administrative unit in the Indian Union and was declared a union territory under the State (Reorganisation) Act 1956. It was a single district union territory till 1971 when Manipur received statehood under the North-East Area (Reorganisation) Act 1971. The state was subsequently divided into six districts in 1981, and the number increased to eight in 1991 and nine in 2001.

The territorial reorganisation in the North-East has taken place largely during the last six decades. The emergence of seven states following sequential bifurcation of Assam and creation of small states is not entirely governed by demand of administrative efficiency. The phenomenon reflects the aspiration and assertiveness of some ethnic and cultural groups who think that they can better manage the affairs as a separate unit, rather than being an insignificant and often neglected fringe constituent of larger Assam. The Nagas, the Mizos and the Khasis are fiercely proud of their culture and tradition and express apprehension of being lost under the Assamese behemoth, which they perceive would swallow them unlike under the colonial rule when they were directly governed by the crown as excluded area.

As the things turn out, there is no interstate acrimony except in trifling border disputes. The present phase is one of integration and since most of these states are still to develop to their potential, each one is preoccupied with its own problems and prospects. The grudging disposition is toward the Central Government for liberal grants, prospect-based assistance and siting of national institutions in different states.

References

Allen BC (1902) Assam. In: Census of India 1901, vol VI, pt II, table I, p 1
Bailey FM (1914) Explorations of the Tsangpo or Upper Brahmaputra. Geogr J 44(4):341–364
Bana's 'Harsha Charita' tr. By Cowell & Thomas, pp 211–223 quoted from Choudhury PC (1987-3rd edn) History of civilization of people of Assam to the XIIth century AD. Spectrum Publications, Guwahati, p 164
Barua BK (1949) Assamese literature. IBH, PEN Books, Bombay, p 17
Barua BK (1951) A cultural history of Assam. K. K. Barooah, Nowgong, p 12
Barua H (1965) Assamese literature. NBT, Delhi
Barua N (2010) Historical geography of early Assam. DVS Publishers, Guwahati, p 41
Bhattacharjee J (2010) Revisiting the western boundary of Kamrup. Northeast Res 1:58–68
Butler (Capt.) JBSC (1875) Rough notes on the Angami Nagas and their language. J Asiatic Soc Bengal 44(pt. IV):307–346
Census of India (1941a) Assam. General population tables, vol XII, p 2
Census of India (1941b) Assam, vol IX, table I, p 3
Census of India (1951) Assam, Manipur and Tripura, vol XII, pt II-A, tables, p 1
Census of India (1961a) Assam general population tables. Brief account of the changes in the area of the state of Assam and its districts from 1901 to 1961, vol XII
Census of India (1961b) NEFA general population tables. Introduction, vol XXIV, pp 1–5
Chatterjee SK (1955) The place of Assam in the history of civilisation of India. Banikant Kakati memorial lectures 1954. University of Gauhati, Guwahati
Choudhury PC (1959/1987) The history of civilisation of people of Assam to the twelfth century AD. Spectrum Publication, Guwahati
Davis AW (1892) Census of Assam 1891, vol I. Assam Secretariat, Shillong
Gait EA (1902) Lower provinces of Bengal and their feudatories. In: Census of India 1901, vol VI-B, pt. III, p 15
Gait EA (1906/1926) A history of Assam. Thacker Spink & Co, Calcutta (reprinted 2005 LSB, Guwahati)
Gait EA (2006) The history of Assam. LBS, Guwahati. Reprinted from Gait EA (1926) History of Assam, 2nd edn. Thacker, Spink & Co., Calcutta
Government of Assam (1999) Assam state gazetteer. Guwahati
Guha A (1977) Planter Raj to Swaraj. ICHR, New Delhi, 392 p
Guha A (1979) Assamese peasant society in the late nineteenth century: structure and trend. Occasional papers no. 25. ICSSR, CSSSC, Calcutta
Guha A (1991) Medieval and early colonial Assam: society, polity and economy. CSSSC, K.P. Bagchi & Co, Calcutta
Goswami SD (2007) Agrarian change and social tension in post 1857 Assam. In: Goswami P (ed) Changing pattern of economy and society – 19th and 20th century North-East India. Department of History, Gauhati University, Guwahati
Her Majesty's Stationary Office (1875) Memorandum of census of British India. Her Majesty's Stationary Office, London
Joppen CSJ (1914) Historical atlas of India. Longman, Greens & Co, London
Mackenzie A (1884) History of the relations of the Government with the tribes of North-East Bengal. Home Department Press, Calcutta, reprinted (2005) as North-East Frontiers of India, Mittal Publication, Delhi
Mackenzie A (1979, 2005) North-East Frontier of India. Mittal Publications, New Delhi. Reprinted from 1884 edition entitled 'History of the relations of the government with the hill tribes of the North-East Frontier of Bengal'. Home Department Press, Calcutta
Neville GA et al (1923) Notes on certain frontier tribes. In: Census of India 1921, vol III, Assam, pt I, report, appendix B. Shillong
Pargiter FE (1897) Ancient kingdoms in Eastern India. J Asiatic Soc Bengal 66:110

Pemberton RB (1835) Report on the eastern frontier of British India. Department of Historical and Antiquarian Studies in Assam, Guwahati, reprint (1966) Mittal Publications; Delhi
Reid (Sir) R (1942) History of frontier areas bordering on Assam from 1883–1941. Assam Secretariat Press, Shillong
Robinson W (1841) A descriptive account of Assam. Ostell & Lapage, Calcutta, p 281
Ryder (Maj.) CHD (1905) Exploration and survey with Tibet Frontier Commission and from Gyangtse to Simla, via Gartok. Geogr J 26(4):369–395
Sarma SN (1981) Social changes in Assam – 1750 to 1950. J Univ Gauhati 28–29:109–121
Shakespear (Col.) LW (1914) History of Upper Assam, Upper Burma and North-eastern Frontier. Macmillan, London, p 106
Superintendent of Government Printing Press (1883) Report on the census of Assam from 1881. Superintendent of Government Printing Press, Calcutta

Part II
The Land

Chapter 3
North-East India: Structural Framework

Abstract Geologically, North-East India presents a stratigraphic sequence which ranges from pre-Cambrian to Quaternary with huge hiatuses in between. The oldest geological formation of the region is represented by the pre-Cambrian gneissic complex of Meghalaya plateau, a craton, and the Karbi-Anglong plateau, both of which are parts of the old Gondwanaland. The Himalayas, occupying the northern border of the region, ranging in height from 1,500 to 7,000 m ASL consist of formations ranging in age from Protozoic to early Palaeozoic in age. These consist of low-grade metamorphics in the southern section to high-grade schists towards the crest of the mountains. The foot zone of the Himalayas is formed by the Tertiary rocks, largely Mio-Pliocene deposits of post-orogenic phase. The rest of the region is formed by Tertiary rocks with different marine facies, ranging in age from Eocene to Pliocene. The movement of the Indian plate to the north as well as to the north-east and east has caused a number of thrusts. The Himalayan Main Boundary Thrust (MBT) and the Naga–Disang thrust separate the Himalayas and the eastern hilly region from Brahmaputra valley. The most notable fault of the region is the Dauki fault, running west–east and separating the Meghalaya plateau from Bangladesh, by a vertical displacement of over 1,000 m. This fault, with a few patches of Cretaceous deposits, at 1,200 m ASL, suggests a post-Cretaceous uplift of the plateau. The north–south ridges and valleys of Mizoram, formed in the Neogene sediments, represent the anticlines and synclines following a balancing compressional movement from the east. The Indo-Myanmar plate boundary is characterised by hills resulting from the underthrusting of the Indian plate and the appearance of ophiolite in the region.

The North-Eastern part of India, usually known as the North-East and comprising seven states, is tectonically similar to the rest of India, except for the fact that 70 % of its area is built of Tertiary rocks, folded and fractured subsequently, to fashion the

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present relief of the region. The Archaean crystalline basement, in the region, is exposed in only three plateau-like ancient blocks, viz. the Meghalaya plateau, the Karbi-Anglong plateau (Mikir Hills) and the Mishmi Hills area. The rest of the region has been a scene of prolonged sedimentation, largely during the Tertiary period, experiencing at the same time movement of the plates, their collision, resulting in orogeny, many folded structures, faults, thrusts and many fault scarps and a very complex relief.

3.1 The Litho-Structure of the North-East

In the geochronological history of the region, there is a virtual hiatus of any stratigraphic sequence belonging to the Mesozoic era, except a few patches of Cretaceous sediments perched on the southern margin of Meghalaya plateau. The Tertiary rocks are directly deposited over the crystalline basement. That suggests that the sea had not encroached in the region till, and even during the Cretaceous period. The onset of the Tertiary period with the Palaeocene witnessed a prolonged marine transgression and the creation of a marine environment for sedimentation, varying with the situation, particularly the depth, of the sea. The region experienced marine sedimentation, varying in intensity, duration and the type of facies, during almost the entire Tertiary period, with the exception of Pliocene during which fluvial sediments dominated the scene. Concurrently with the sedimentation, there have been tectonic disturbances and orogenetic movements, triggered by the movement of the Indian plate, producing in the process, all kinds of tectonic landforms, which were denuded and subjected to further movements, giving rise to a rejuvenated relief.

The thickness and the facies of the sedimentary deposits vary from area to area, depending on the depth of the sea and the intensity of concurrent erosional processes supplying the sediments, to form the present relief of the region, during the Palaeogene and Neogene periods.

Geologically, the most ancient part of the North-East, the Meghalaya plateau and its outlier, the Karbi-Anglong plateau, are an extension of the Archaean land mass of Peninsular India, carried either through a tear fault or detached from the main peninsular block by a zone of subsidence, a rift along 90° E longitude. The northern part of the region is bordered by the Himalayas, as in the case of mainland India. The Himalayan range forming the northern border of the region and the pre-Cambrian ancient gneissic complex of Meghalaya and the Karbi-Anglong in the south are separated from each other by the Brahmaputra valley with a narrow Quaternary flood plain and terraces, bordered on either side by Tertiary deposits. Subjected very heavily to tectonic movements, especially compression, the Tertiaries have undergone a prolonged period of denudation, producing, in the process, the present-day complex relief of the North-East. Leaving aside the Great Himalayas and the ancient Archaean block of Meghalaya and the Karbi-Anglong plateau, the

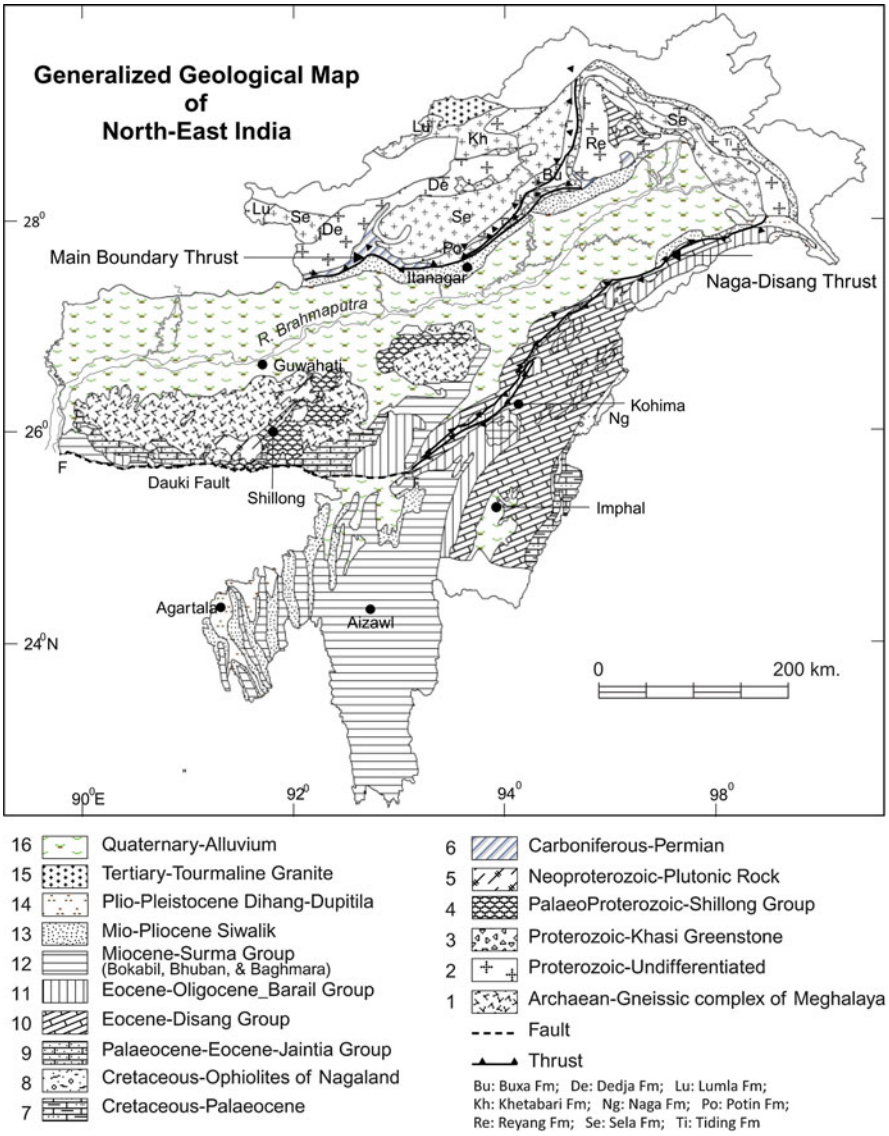


Fig. 3.1 Generalised geological map of North-East India (Modified after the Geological Survey of India, Government of India-1998-'Geological and Mineral Map of North-East India')

rest of the North-East displays a general northeast–southwest structural alignment. The most important geological feature of the area is the presence of a single large and contiguous exposure of Tertiary formations, transformed into NE–SW and N–S trending folds (Fig. 3.1).

The two main rivers that drain the region are the Brahmaputra on the north, flowing in a NE–SW direction, and the Barak in the south that flows through Manipur and Cachar plain to Bangladesh. The Barail range forms the water divide between the two river systems. The geology, tectonics and stratigraphy of the region are discussed here, in the order of their age, taking into account distinctly the apparent litho-structural units.

The region is resolved into the following litho-structural units:

1. The Archaean gneissic landmass of Meghalaya, corresponding in age to Deccan shield, and its outlier in Karbi-Anglong plateau.
2. The Tertiary landmass of eastern, south and southeastern part of the region. Tertiaries also occur in the Siwaliks of the Himalayas, but they are discussed in the context of the Himalayan range.
3. Brahmaputra and Barak river valleys.
4. The Himalayas and their foothills, the Siwaliks of Tertiary origin and volcanics (Abor volcanics) of the North-Eastern extremity.
5. The Eastern Mountain belt, though largely composed of Tertiaries, characterised by an ophiolite-Cretaceous melange zone, the Indo-Burmese plate boundary, the subduction zone and the suture.

The plateaux of Meghalaya and Karbi-Anglong, separated from each other by a fracture occupied by the river Kopili, are geologically the oldest landmass of the region, dating back to pre-Cambrian.

3.1.1 The Meghalaya Plateau

Occupying an area of over 20,000 km^2, the Meghalaya plateau is a tectonically uplifted block. Ranging in altitude from 300 m ASL in the west (Tura, 370 m ASL) to 1,000 m ASL in the east, and from 100 m ASL, on the edge of Brahmaputra, in the north, to 1,300 m ASL in the south (Cherrapunji 1,330 m ASL), it is bordered on all sides by faults, of which the Dauki fault, separating Meghalaya from Bangladesh and creating a scarp face of over 500 m, is the most conspicuous. On the west, the plateau is separated from the Brahmaputra basin by Dhubri fault, on the east by Kopili fault, covered with recent alluvium of Kopili, and in the north by a series of step faults. The fault between Brahmaputra valley and Meghalaya – and there could be more than one – is not commonly recognised by geologists, but is unambiguously mentioned by Krishnan (1960).

Thus, the Meghalaya plateau attains the attitude of a horst, towering high above the neighbouring Bangladesh plain in the south, and the Brahmaputra basin (60 m ASL) in the north. The highest point of the plateau is the Shillong Peak (1,961 m ASL), close to Shillong City, which has a height of 1,500 m ASL. Unlike the steep scarp face of the Dauki fault in the south and a relatively steep descent to the north, the plateau descends westward over stepped surface to Tura, the headquarters of West Garo Hills district. It slopes steeply to the north losing a height of 1,500 m in a distance of 80 km, between Shillong (1,500 m ASL) on the plateau and Guwahati

Photo 3.1 Weathered granite, 30 km south of Shillong on the road to Cherrapunji

(50 m ASL) on the bank of Brahmaputra. Eastward, it slopes rather gently and dips below the Kopili alluvium.

3.1.1.1 Lithological Characteristics of Meghalaya Plateau

Lithologically, the plateau is formed of the pre-Cambrian granite–gneiss complex, composed of coarse-grained granitoid gneiss, banded gneiss and migmatites, grey and sometimes pink gneiss and schists (Raju 1993) (Photo 3.1). These ancient gneissic rocks occupy much of Meghalaya plateau. Subjected to ages of weathering and planation, the gneiss complex is often covered with clay. This is by far the most extensive rock formation in Meghalaya and extends northward up to Brahmaputra and even beyond, appearing as broad inselbergs. The hills in the vicinity of Guwahati, like the Nilachal Hill, are an extension of the Meghalaya plateau. Similarly, the semi-circular outcrop of Archaeans, in Karbi-Anglong district, interposed between the Barail range in the southeast and the Brahmaputra in the north-west, represents an outlier of Meghalaya plateau (Fig. 3.2).

3.1.1.2 Shillong Rocks

Lying unconformably over the gneissic plateau of Meghalaya, an undulating planation surface, are the Proterozoic meta-sedimentaries of Shillong group, represented by quartzite, phyllites and occasionally pebbly conglomerate, deposited over the gneissic basement, during the Proterozoic period (Sarma et al. 1991). These rocks

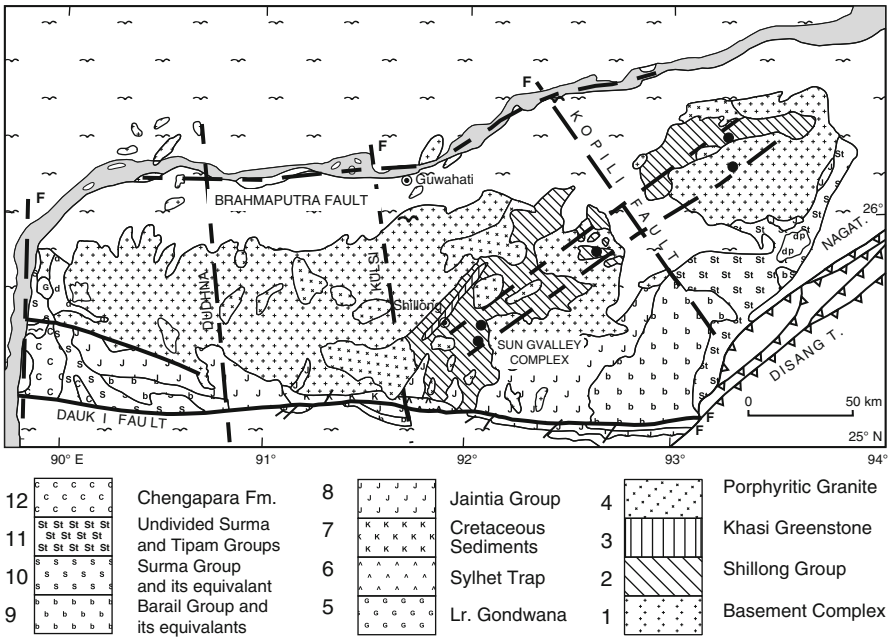


Fig. 3.2 Geology and structure of Meghalaya (Modified after Nandy 2001, reproduced with the permission of ACB Publishers, Kolkata)

are very resistant and stand prominently in the landscape. The two important peaks in the vicinity of Shillong, viz. Shillong and Laikar peaks, are formed in Shillong group of rocks mainly quartzites. These quartzites can be seen on the NEHU (North-Eastern Hill University) Campus behind the Central School. The Shillong rocks also occur in a 10- to 15-km-wide east–west belt, in the gneiss complex of Karbi-Anglong. What appears probable is that during the Proterozoic, a narrow arm of sea occupied a NE–SW belt cutting across the present Karbi-Anglong and eastern Meghalaya. The sediments deposited in this narrow sea were later metamorphosed into Shillong rocks. The Shillong rocks host a large body of rocks known as Khasi greenstone, having ultrabasic to basic affinity. Often, these ultrabasic intrusions like Khasi greenstone (amphibolite) occur along a shear zone.

3.1.1.3 Granitoid Intrusions

Large masses of circular or ellipsoid hills on Meghalaya plateau, extending as far north as beyond Brahmaputra river and even beyond, are the granitoid intrusions. These granitoid bodies, intrusive in the gneissic complex and subsequently exposed as hills, stand out as large inselbergs, both on the Meghalaya plateau as well as on the Brahmaputra plain in the longitude of Guwahati. A series of basaltic dykes, in

West Garo Hills and the southern margin of Meghalaya plateau, could have been formed during the Cretaceous or even the Jurassic period.

While the main plateau of Meghalaya is formed of gneissic rocks, its margins experienced marine transgression during the Cretaceous period, leaving behind sedimentary deposits, which were uplifted subsequently to the present height and are seen on the southern margin of the plateau. The Cretaceous rocks, represented by Mahadak formation, on the southern edge of Meghalaya, composed largely of sandstone, and Jadukata formation further west, are the upper Cretaceous and Danian (highest stage of Cretaceous) deposits. The Mahadak formation presents thick beds of conglomerate with occasional sandstone, whereas the Langpar formation overlying it is formed by sandy limestone and sandstone. The Langpar unit could even overlap and cut into Palaeocene. These Cretaceous and even Tertiary formations on the margin of the plateau provide the unfailing evidence of a post-Cretaceous uplift, bringing these formations to a height of around 1,400 m ASL.

3.1.1.4 The Tertiary Rocks on the Margins of Meghalaya Plateau

These are also known as the rocks of the Meghalaya Platform, because of the facies showing the characteristics of a marine platform. The Tertiary deposits, which cover about 70 % of the area of the North-East region, have encroached on Meghalaya only marginally, suggesting that during the long period of about 100 million years, beginning from the mid-Cretaceous till the Quaternary, much of Meghalaya, unlike the rest of the North-East, has stood above sea. The plateau was encroached only marginally by the sea during late Cretaceous and early Tertiary periods, leaving behind some Cretaceous and Tertiary sediments. The oldest Tertiary rocks, dating back to Palaeocene–Eocene period, occur on the eastern, southern and southwestern region of Meghalaya, occasionally showing a complete stratigraphic sequence, at different altitudes ranging from 250 to 1,400 m ASL.

The Tertiary rocks of Meghalaya, largely sedimentary, are divided into various groups and are known by local formations. The earliest known formation, though limited in extent, overlying the Sylhet trap, in southern part of Meghalaya plateau, is the Langpar formation of Cretaceous–Palaeocene period. A more extensive exposure of Tertiary rocks is represented by Jaintia group of Eocene period, occurring in southeastern and southwestern part of Meghalaya. The Jaintia group of rocks, occurring in Jaintia Hills area, are best represented by Shella formation, named after a section in Shella river, but more commonly known as lower, middle and upper Sylhet rocks of Palaeocene–Eocene period. Each of these lower, middle and upper formations are about 100 m thick, starting at the base with coarse gritty sandstone, overlain by hard, grey and ferruginous limestone, followed upward by alternate thickness of limestone and sandstone. These rocks also occur in the southwestern part where they start with Tura sandstone at the bottom, overlain by much thinner beds of shale, sandstone and limestone known as Siju formation.

The Barails, a group of rocks of Oligocene period, occupy very small areas in the southeast and southwest part of the plateau. In the extreme southwest part of the

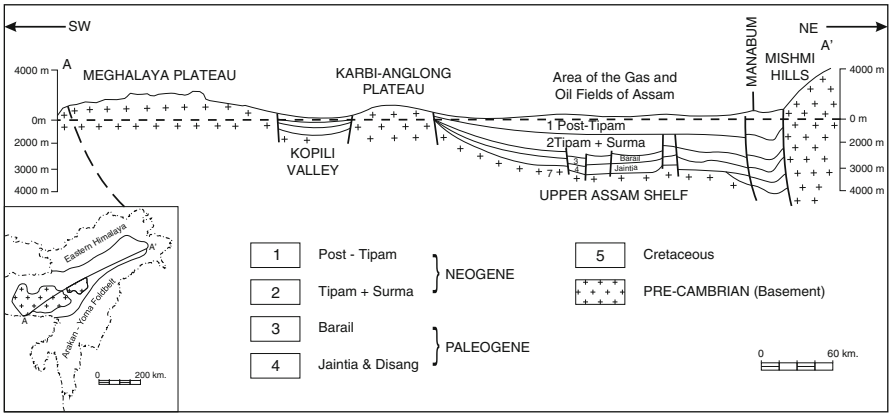


Fig. 3.3 Simplified geological cross-section from Meghalaya Plateau to Mishmi Hills (Adapted from Das Gupta and Biswas (2000) 'Geology of Assam' reproduced with the permission of the Publishers 'Geological Society of India', Bangalore)

plateau, where it loses its height and descends to a level of 200 m bordering the north–south Dhubri fault, there are small patches of Miocene rocks known as Baghmara formation. Some of these low-level deposits on the western margin of the plateau are of a later period, like Mio-Pliocene or even undifferentiated Plio-Pleistocene (Fig. 3.3).

The Tertiary sequence in different parts of Meghalaya, though similar, is not identical, as the shelf conditions in all parts of the plateau may not have been the same and the depth of the shelf and some localised movements may have introduced differences. But, there is almost a complete sequence of sedimentation from Palaeocene to late Eocene. The Oligocene, largely represented by Barail rocks, occupies only a very limited area of the southeastern part of the state. In fact, the Barails of Meghalaya represent the southwestern limit of these rocks. There are small patches of Neogene, represented by Baghmara formation of Pliocene period. These formations are named after Baghmara and Chengpara, the two towns located in the mid-south and southwestern margin of Meghalaya plateau.

3.1.1.5 The Karbi-Anglong Plateau

Geologically and structurally, the circular Karbi-Anglong gneissic complex to the North-East of Meghalaya, and separated from the latter by the intervening alluvium-filled Kopili fracture and the river of the same name, is similar to Meghalaya. On its eastern side, it is separated from Nagaland plateau by the Nagaland–Disang thrust and Dhansiri river. It lies between the river Kopili in the west, the river Dhansiri in the east, the Brahmaputra plain in the north and the Barail ranges in the south. Like Meghalaya plateau, it is essentially a pre-Cambrian gneissic complex with its central point at Chenghehishon and a North-East–southwest arcuate band of Proterozoic

rocks of Shillong group. As in Meghalaya, granitoid plutons are observed at several places. On the southeast margin of the plateau are exposed some Palaeogene and Neogene formations belonging to the Surma group of rocks. The northern and the western fringe of the plateau are buried under Quaternary deposits.

3.1.2 Tertiaries of the East, Southeast and Southern Part of the Region

The Cainozoic rocks cover about 70 % of the area of North-East India, divided into two parts: (1) the Tertiary rocks, covering a narrow belt in the foothill zone of the Himalayas, the Siwaliks, and (2) almost the entire area of Nagaland, Manipur, Mizoram and Tripura. The Quaternary deposits are confined to recent alluvium of Brahmaputra, occupying a width of 70–100 km, for a distance of 700 km. along the river from Dibrugarh to Dhubri, and the Barak plain.

The Tertiary rocks cover the entire south and southeastern part of the region and range in age from 70 million years for Palaeocene and Eocene to 2 million years for late Pliocene. These have been subjected to tectonic movements, several cycles of erosion, presenting surfaces of unconformity and a series of folds and faults. The eastern extremity of these Tertiary rocks, being on the plate boundary, has been subjected to the movement of the plates, collision and subduction, throwing up in the processes, a series of northeast–southwest or north–south, trending mountain chain. The Patkai, Naga and Lushai Hills, all lying on the margin of the Indian plate, have resulted from the collision of the Indian plate with the Burmese plate. The extreme crushing and grinding of the plates has also produced the ophiolite belt on the eastern margin of Nagaland. Successive compressive movements have transformed the Tertiaries of Tripura and Mizoram into a series of parallel and subparallel mountains and hills. The total depth has an alternate sequence of sandstone and limestone beds, with occasional lenses of coal. The thickness of Tertiary sediments is variable from 5,000 m in the shelf areas to 13,000 m in the geosynclinal sea (Evans 1964). Tertiary rocks are the depository of coal, petroleum and gas in the North-East as well as Bangladesh.

The entire sequence of early Tertiary rocks of Palaeocene–Eocene period is grouped together under two formations, occurring in two linear zones, known as the Jaintia and Disang group of rocks.

3.1.2.1 The Jaintia Group of Rocks of Eocene Period

The Jaintia group of rocks is well developed in the Jaintia Hills district, east of Jowai. These are confined to Meghalaya shelf on its southeast and southwest margin of Meghalaya plateau. Known by different formation names, starting from Sylhet sandstone and limestone in the southeast to Tura sandstone topped by Siju limestone in the west of the plateau, the entire sequence ends with Kopili formation. The Kopili formation, named after Kopili river, is the uppermost member of the Eocene sequence of Meghalaya shelf.

3.1.2.2 Disang Group of Rocks

The most widespread of Tertiary facies is marked by sedimentation in the geosynclinal sea during the Eocene, seen today in a sequence of shale grading upwards into siltstone with local characteristics. An extensive occurrence of these facies, supported with palaeontological evidence, is known as 'Disang' group of rocks after the river Disang, a left bank tributary of Brahmaputra, originating in the Hills of Tirap (southernmost district of Arunachal Pradesh). Varying in thickness from 1,500 m in Surma basin to 3,000 m in Upper Assam and Nagaland, the outcrops of Disang group of rocks cover much of Nagaland and Manipur, particularly their broad central belt, and a very narrow saddle running NE–SW, southwest of Kohima, exposed along the great Naga–Disang thrust. Though stratigraphically overlain by Barails of the Oligocene period, Disang and Barails occasionally crop out, juxtaposed to each other and separated by a thrust. In fact, in Nagaland and Manipur, the Disangs are interposed between the calcareous Palaeocene–Eocene and ophiolite melange on the plate boundary on the east and the Barails in the west.

3.1.2.3 The Barails: The Barail Group of Rocks

The word 'Barails' is used in two senses, in a physiographic sense representing the Barail mountain range as well as in the geological sense to represent the Barail rocks of Oligocene period. While the geologists define the Barail group of rocks, largely arenaceous, of Oligocene period, as a litho-structural unit in the Tertiary stratigraphic sequence, the geographers recognise them as Barail range, because of the heights these rocks have attained following the compressive movement from the south against the stable gneissic core of Karbi-Anglong. The Barail mountain ranges are chiefly composed of the Barail rocks and form the principal water divide between the Brahmaputra and Barak valleys.

The Barail group of rocks is very widespread following the alignment of eastern mountain ranges and standing as a great divide of Barail range that separates the Brahmaputra basin in the north from the Barak basin (also known as Surma basin) in the south. The type area of Barail group of rocks lies in the Barail range north of Silchar, southeast of the major Haflong–Disang fault or Naga–Disang thrust. The rocks attain a prominent height in the landscape. About 85 % of North Cachar Hills district is made of Barail group of rocks.

Another large outcrop of Barail rocks lies in a central north–south linear zone of Manipur. This 35-km-wide zone, west of Imphal, is interposed between the older Disang group of rocks of Palaeocene period on the east and the Surma group of rocks of Miocene period on the west, separated from the latter by Kadi fault (Das Gupta 1977).

The Barail rocks were deposited in a shallow subsiding basin during the Oligocene and are very prominent in relief. These are largely made of thick pile of arenaceous sediments of marine shelf facies, represented by bluish-grey sandstone with partings of shale (Raju 1989–1990). In composition, the Barails are

represented by a sandy formation at the base known as Laisong formation (named after Laisong town on the eastern border of Cachar Hills) overlain by argillaceous formation recognised as Jenam formation named after Jenam river southwest of Kohima and topped by Renji sandstone. The Laisong formation is composed of multi-storeyed coarse sandstone with calcareous mudstone that passes by a gradation to be replaced by Jenam formation with shales and thinly bedded coarse sandstone. Renji formation has massive, thick-bedded, hard grey sandstone. The Barail rocks attain a maximum thickness of 1,000 m in North Cachar hills.

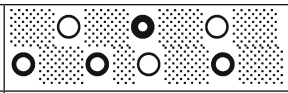
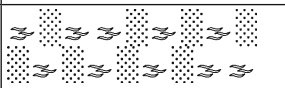
In addition to the Jaintia group of rocks of Palaeocene–Eocene period, Barails are a major source of coal in what are known as Tikat Parbat and Bargolai formations.

3.1.2.4 The Surma Group of Rocks

Dating their origin to Neogene (Miocene and Pliocene), the Surma group of rocks form almost the entire terrain of Tripura and Mizoram and its northern extension into a long narrow fringe area of north-east–southwest-trending Naga–Disang thrust. While the states of Nagaland and Manipur are covered by older Tertiary rocks of Eocene and Oligocene periods (Disang and Barail group of rocks), Mizoram and Tripura, with the exception of the western one third of Tripura which is covered with recent alluvium, are entirely composed of Miocene and Pliocene rocks. In fact, the entire folded belt of Surma valley, Tripura, Mizoram Hills and Chittagong Hill tracts and costal Burma belong to a single geological unit referred to as Surma basin.

In terms of relief, the Surmas occupy the synclinal depressions, while Barails are exposed along the anticlinal core. These rocks, poor in fossils, have a thickness of more than 4,000 m in Tripura and over 7,000 m in Mizoram, and close to the Bangladesh border, the basement is 13,000 m below the surface.

Stratigraphically, the Miocene–Pliocene series of Surma group starts with sandy Bhuban formation at the base overlain by Bokabil formation which is argillaceous in composition. These grade into Tipam and Dupatila formations.

Plio-Pleistocene		Ferruginous sandstone conglomerate	Dupatila	Surma group
Pliocene		Sandstone	Tipam	
		Argillaceous	Bokabils	
Miocene		Shales with sandstone	Bhuban formation	

These Tertiary rocks of Neogene (Mio-Pliocene), occupying the entire state of Mizoram and Tripura, are folded into series of linear narrow anticlines and synclines forming a unique foreland fold belt (Nandy et al. 1983). The result of the folding

Photo 3.2 Boulder and gravels in Siwalik formation in Arunachal Pradesh, 30 km north of Itanagar

is a series of anticlinal hills and synclinal valleys occupied by rivers following the structural trend. Nandy has suggested 15 major long, arcuate anticlines and synclines trending NNW–SSW to NNE–SSW in the belt, the folds being convex towards the west. The Atharamura, Baramura, Longtarai and Machamura, Jampui and Sakhan ranges of Tripura and Chaifil and Uiphum ranges of Mizoram represent the anticlines of these folds. The width of the synclines and anticlines gradually decreases from west to east because of greater compression, and the hills become sharp crested.

3.1.3 The Himalayan Belt and the Foothill Tertiaries (Siwaliks)

Occupying about one-fourth of the area of the North-East are the Himalayan Ranges and their foothills, covering the entire Arunachal Pradesh, formerly known as the North-East Frontier Agencies. This largely mountainous region, bordering Tibet in the north, Burma in the east and Bhutan in the west, is the most dissected part of the North-East. The Tertiary formations occupy the foot zone of the Himalayas in a narrow belt, not exceeding 30 km, with the exception of Yingkyang formation, north-west of Pasighat, in the eastern part, with a thickness of over 800 m, dating back to Eocene period (Photo 3.2).

The Himalayas ranging in height from 1,500 to 7,000 m ASL, forming the watershed between India and Tibetan Plateau, consist largely of unclassified Himalayan rocks

from late Proterozoic to early Palaeozoic in age. These consist of low-grade metamorphics in the southern section to high-grade schists as one moves towards the crest. The crystalline thrust sheets of the Himalayas, the unclassified Himalayan formations, are known by different formations depending on the locales, like Dirang and Sela group in the western part, the Tidding formation in the extreme east or Reyang formation in the central part. On the southern margin of the Himalayan Range, a thin belt shows Permo-Carboniferous facies, corresponding to Gondwana, sandwiched between the Himalayan crystalline on the north and the molasse of the late Tertiary period in the south.

The southern half of the Himalayas is riddled with thrusts, trending NE–SW parallel or oblique to the alignment of the range. The eastern section, however, shows a block-like structure marked by Mishmi thrusts having NW–SE orientation.

The pre-Gondwana rocks of the Himalayas are essentially pre-Cambrian, highly metamorphosed or different grades of crystalline rocks known as different formation in different areas.

3.1.3.1 The Gondwana Rocks

The narrow thin wedge of Gondwana rocks (Permo-Carboniferous), between the crystallines of the lesser Himalayas and the Tertiary molasses (Siwalik) in the south, has both marine as well as continental facies. They are separated from the Tertiary of Siwaliks by the MBT (Main Boundary Thrust) that runs along the entire Himalayan belt and from the lesser Himalayas by the Main Central thrust.

3.1.3.2 The Tertiaries of the Foothill Zone

The Tertiaries of the Himalayan foothill zone are the Neogene formations, mostly Mio-Pliocene deposits of the post-orogenic phase, that were subsequently compressed and uplifted. The Tertiaries, lying between the MBT and the Brahmaputra, attain an estimated thickness of over 1,300 m in Subansiri region, which gradually diminishes to 800 m towards Pasighat, before pinching out beyond Siang gorge near Mebo. Typical among the Neogene molasse deposits is the Tipam molasse of upper Assam with a thickness of over 4,000 m. The typical Tipam outcrops are confined to the area between the Naga and Disang thrusts, largely in the foothill zone of Naga Hills. The Tipam rocks were deposited during the Miocene in the eastern part of the Assam shelf, with lower facies of sandstone and upper clay horizon of Girujan clay. The north-west extension of Tipam across Brahmaputra corresponds to the Dafla formation of the Siwaliks.

Since Eocene fossils have been recorded from a number of sites in the East Siang, West Siang and in the West Kameng districts, it is believed that the Tertiary sedimentation in Arunachal Pradesh area began with the transgression of Eocene sea. ONGC has classified the Neogene (Miocene–Pliocene) rocks of Arunachal into three units. These start with Dafla formation at the base, composed of grey

sandstones, greenish shales and occasional pebble beds. The Daflas are overlain by Middle Subansiri formation of a thick sequence of medium and coarse-grained sandstones and topped by Kimin formation consisting of pebble–cobble beds. All these formations are truncated by thrusts. The Dafla formation of Arunachal, because of the occurrence of foraminifera, presents a brackish-water facies and is comparable to Surma group. Subansiri is the continuation of Tipam of Assam, and Kimin formation is compared with Dihang in Assam.

3.1.4 The Eastern Mountain Belt

Much of the mountainous eastern boundary of North-East India, lying in the four states of Arunachal Pradesh, Nagaland, Manipur and Mizoram, is composed of Tertiary rocks, largely the Disangs of Palaeocene and the Barails of Oligocene period. In Tirap and Nagaland, in the eastern part, there is an overlapping of Disangs and the Barails, whereas in Manipur, the eastern part is marked by the outcrops of only older Disang rocks. The elongated belt of Barail rocks, to the west of Manipur, described earlier, continues further south in Mizoram, though leaving a small eastern fringe, almost the entire Mizoram and Tripura are covered with Miocene and Pliocene rocks of Surma and Tipam groups. The contact zone of Indian and Burmese plates is marked by some Cretaceous pelagic deposits, and the Proterozoic Naga metamorphics which are uplifted to the surface and exposed, and some patches of ophiolites of the suture zone, a characteristic melange, common to the plate-contact zone of subduction.

3.1.4.1 Quaternary Alluvium

Nearly 30,000 km^2 of the alluvial basin of North-East India carries alluvial deposits ranging in age from 700 to 50,000 YBP. There is unconformity between the buried Neogene folded rocks and the overlying alluvium, which are seen in the older alluvial terraces and the flood-free zone of alluvial surfaces and the flood-prone outer flood plain.

3.2 Geological Evolution of North-East India

There is a general agreement, based on the geological and geophysical data collected from the Indian Ocean floor, that the Indian plate moved north and north-east-ward since Cretaceous time for a distance of over 1,000 km (Nandy 1983) and collided against the Eurasian and Burmese plate during the Cretaceous–Palaeocene time. The detachment of North-East India from the rest of the peninsular shield or Indian plate is explained by Ninety (degree) East transform fault, roughly the present alignment of Brahmaputra and Dhubri fault. Earlier geologists explained

this detachment by a graben, which was subsequently filled up with post-Jurassic sediments (Krishnan 1960:60). The Ninety East transform fault, almost coinciding with the graben of earlier geologists, is post-Cretaceous, as the movement of the plate itself started in the beginning of the Cretaceous and collided with the Eurasian plate during the late Cretaceous–Palaeocene time. Later the subduction of the Indian plate below the Central Asian plate in the north and the Shan–Tenasserim (the Burmese) plate in the east, created, in each case, a suture zone and a trench-like environment, where pelagic sediments were deposited, followed by an ejection of mafic minerals like ophiolite. The collision of the plates also created a situation in which marine transgression occupied much of what is represented by Tertiary sedimentation. But, even before the Tertiary basin was formed in the North-East, part of the area was marginally subjected to Cretaceous marine transgression. The Cretaceous transgression has left its signature in the southern fringe of Meghalaya and eastern margin of Nagaland and Manipur, but during the Tertiary, the marine arm of the sea had a very widespread reach in the eastern and southern part of the region and even in the North-Eastern part of Arunachal. The Brahmaputra valley was then a basement ridge where not much Tertiary sedimentation took place. The Tertiary sea that occupied much of the North-East region east of Brahmaputra and south of Meghalaya including the area now under Bangladesh was the scene of sedimentation for a long time from Palaeocene to Pliocene, a span of 60 million years. The sedimentation was not continuous as tectonic events changed the relief intermittently and different areas received different thickness of sedimentation. Similar sedimentation also occurred in the eastern part of the foothill zone of the Himalayas, now recognised as ‘Siwaliks’ composed largely of ‘molasse’ of the Himalayan post-paroxysmal phase.

3.2.1 The Tectonic Events

The tectonic events, that shaped the present configuration of the region, started with the onset of the Cretaceous period, which witnessed the detachment of the Indian plate from the Antarctic–Australian plate and its movement north and north-eastward between the Chagos–Laccadive transform fault and the Ninety Degree East ridge. The Indian plate moved over a distance of 1,000 km before achieving its contact with the Eurasian plate in late Cretaceous to early Eocene period (Nandy 1983). This was followed by the detachment of Meghalaya plateau from the mainland by a rift and the occurrence of a major tectonic event marked by an uplift of Meghalaya plateau and downsliding and subsidence of Bangladesh, along the Dauki fault that separates the two. The southern fringe of Meghalaya is marked by not one but a series of faults, of which the Dauki fault, believably a tear fault (Evans 1964), is the most conspicuous. The occurrence of faults of varying intensity, on practically all sides, gave the Meghalaya plateau the appearance of a horst, bound by Dauki fault on the south, Dhubri fracture in the west, Kopili fracture in the east and a fault slope appearance in the north, as suggested by Krishnan (1960).

Much of the Meghalaya plateau had acquired its present configuration by the beginning of the Palaeocene, and the Tertiary sedimentation did not affect it substantially except on the eastern margin now marked by Jaintia group of rocks and some patches on the southwestern fringe of the plateau.

The arm of the sea, that occupied the present area of Tertiary rocks, was subjected to a prolonged sedimentation into a subsiding sea. With the gradual movement of the Indian plate to the north and east, the compacted Tertiary sediments with different facies, reflecting the specific marine environment, were compressed into folds and thrusts, the latter resulting from an excessive compression and reverse faults.

There is no unconformity between the Disang group of Eocene and the Barail rocks of Oligocene, suggesting that there was a long period of undisturbed sedimentation, broken only by major movement during the Miocene, which caused folds and thrusts in different areas. The main axis of this fold follows the alignment of NE–SW Disang–Naga–Haflong thrust that gave rise to Barail range that separates the Brahmaputra basin in the north from the Barak or Surma basin in the south. A slightly rotary movement, pressing against the Brahmaputra ridge, resulted in a series of thrusts well demarcated by asymmetrical slices of uplands and valleys. The north-western part of Nagaland is characterised by a schuppen belt, an imbricate structure following recumbent folds.

The Disang–Naga–Haflong thrust is a major structural element in the geology of the North-East. The Naga Hills and the Barail range that emerged following the compression from the south formed a major relief feature, secondary to the Himalayas (Fig. 3.3).

Almost at the same time, the movement of the Indian plate and its collision against the Tibetan block in the north created the Himalayan ranges with multiple thrusts involving not only the meta-sedimentary rocks but even the crystalline rocks which were thrown up in some of the highest Himalayan ranges. The main component of the plate movement being to the north, the Himalayas attained a much greater height. These movements must have continued through the entire duration of the Neogene period.

3.2.2 The Main Boundary Fault and the Main Central Thrust

The Eastern Himalayas lie almost exclusively in the state of Arunachal Pradesh, the southern boundary of which is marked by the Main Boundary Fault (MBF) which is aligned parallel to the Brahmaputra river around 40–60 km to its north. The Himalayas are separated from the Siwalik foothills by the Main Boundary Thrust (MBT), which runs NE–SW through the entire length of the Eastern Himalayas. The Siwaliks are formed of the sediments, largely eroded from the Himalayas in a previous phase and commonly recognised as molasse. North of the Main Boundary Thrust (MBT) is the Main Central Thrust (MCT), followed by a series of thrusts further north. As can be seen, the Brahmaputra plain is confined between the Siwaliks in the north and the

Disang–Haflong thrust in the south. The eastern piedmont region of the Himalayas is marked by a series of NW–SE-trending reverse faults, associated with Mishmi thrust. The name Mishmi is derived from the Mishmi tribal group living in the North-Eastern part of the region.

The third set of tectonic events and features are marked by the emergence of several north–south trending folds, over the entire area of Mizoram and Tripura. These folds are formed in a pile of thick Tertiary deposits, uplifted into a series of anticlines occupied by ridges and equally abundant synclinal valleys. The arcuate outline of the Burmese arc suggests that there must have been an orogenetic movement from the east that produced a series of parallel and subparallel tectonic features.

3.2.2.1 The Collision, Subduction and Suture Zone of the Indian and Burmese Plates

The eastern limit of the region, both geologically and physiographically, is marked by a narrow zone that represents the collision of the Indian and Burmese plates, a subduction zone and an Indo-Burmese suture. All along this north–south trending narrow subduction zone, there is melange of Proterozoic meta-sedimentaries, Cretaceous limestone and ophiolite (Fig. 3.4).

To summarise, the following tectonic events and elements broadly define the structure of the area:

1. A series of peripheral faults on all sides of Meghalaya, the most important being the Dauki tear fault, separating the Meghalaya plateau from Bangladesh. The Kopili fracture on the east and the Dhubri fault in the west define the outline of Meghalaya.
2. Disang–Naga–Haflong thrust – It defines the principle water divide of the North-East, separating the Brahmaputra basin from Barak basin. Associated with the thrust and following its alignment are the Barail range and the Naga and Patkai ranges.
3. The Main Boundary Thrust (MBT) separating the low-height Siwaliks and the Brahmaputra plain from the rising Himalayas that reach a height, as much as 7,000 m ASL, in Arunachal.
4. The N–S trending folds in the Miocene–Pliocene deposits of Mizoram and Tripura, transformed into parallel and subparallel anticlinal ridges and synclinal valleys.
5. The collision zone of Indian and Burmese plates marked by subduction and the emergence of rocks of different ages like Proterozoic metamorphics, though with small outcrops, Cretaceous sediments, and mafic ophiolites that characterise the suture zone of the plates.
6. A Brahmaputra fault – The possibility of a Brahmaputra fault, following the alignment of the river, perhaps in the basement (Nandy 2001:178, after Kayal et al. 2006). Though buried under alluvium, the fault would certainly influence the seismic activities in the area and may produce major shocks when activated.

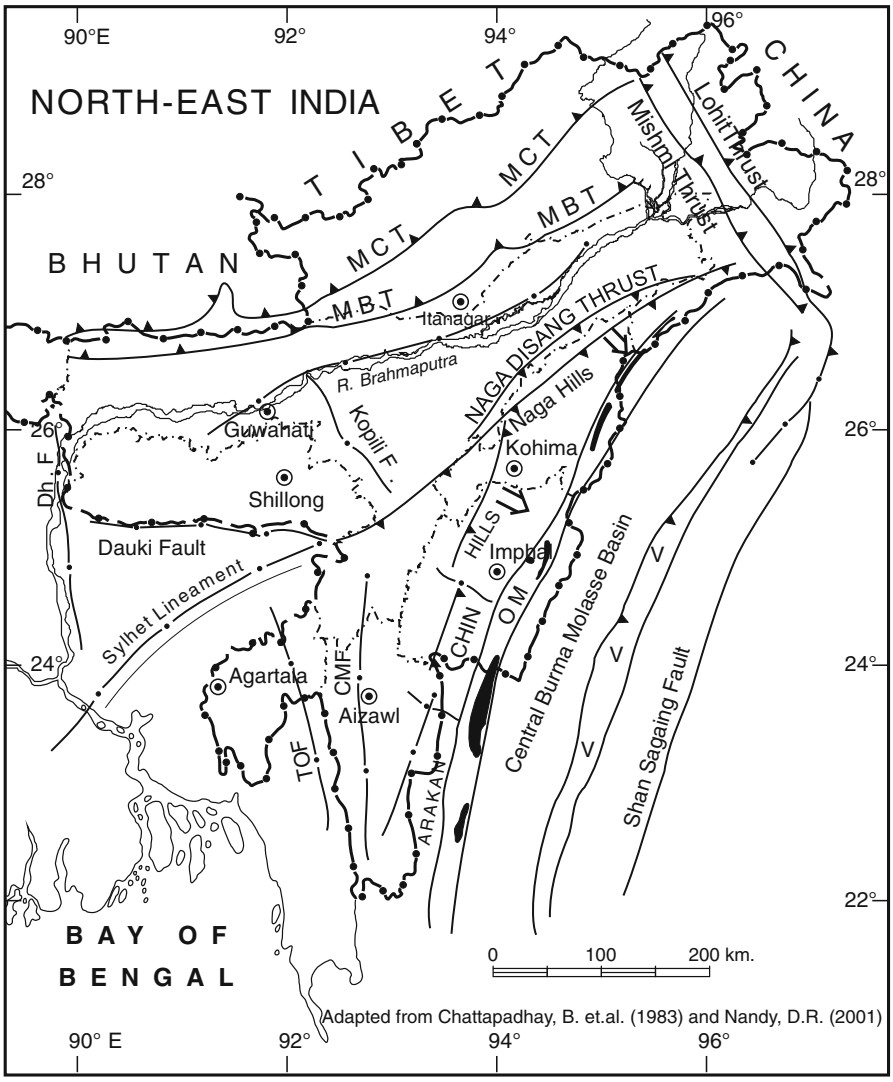


Fig. 3.4 Main tectonic features of North-East India (Modified from Chattapadhay et al. 1983)

3.3 Tectomorphic Features

The surface expression of tectonic activities is seen in a series of escarpment, arrangement of parallel ridges and deep valleys in Nagaland, Manipur, Mizoram and Tripura.

3.3.1 The Grand System of Faults and Fault Escarpments

The most spectacular is the longest system of fault, which starts from Dauki tear fault, initially east–west but trending to north-east, just south of Haflong and then merging with the Naga–Disang thrusts. In the case of Dauki fault, there is displacement of more than 600 m from the southern edge of Meghalaya plateau down to Surma plain in Bangladesh. Similar is the scarp between Haflong (1,736 m ASL in the vicinity) and the Cachar plain (100 m ASL), the former representing the height of the Barail range and the scarp overlooking the Cachar plain, resulting from the eastward extension of Dauki fault.

The Kopili fault, now fossilised and filled with alluvium, is occupied by the upper course of the river Kopili, a southern tributary of Brahmaputra. The Kopili fault also delineates the eastern margin of Meghalaya plateau, much like Dhubri fault, occupied by Brahmaputra that forms the western margin of Meghalaya plateau. The Meghalaya plateau is like a horst presenting not a block between two rift valleys, but a plateau isolated by relatively steep peripheral faults of unequal magnitude and uplifted to form a horst. That the plateau is flat could be explained by a very prolonged process of denudation over millions of years, which have left traces of planation in the western half of the plateau.

The other major escarpment is the Nagaland fault escarpment that rises to 1,800 m ASL from the Brahmaputra plain. The Naga–Disang thrust is a part of this fault. It runs almost parallel to Brahmaputra and separates the Brahmaputra plain from the Naga Hills.

3.3.2 The Main Boundary Fault and the Main Central Thrust of the Himalayas

In the Himalayan belt of Arunachal Pradesh, north of Brahmaputra, there is a series of faults and thrusts.

Not quite comparable, but similar to the eastern mountainous zone, where a series of partially eroded anticlinal hills and synclinal valleys are marked by a series of thrusts culminating into a schuppen belt, there are a number of east–west-trending faults and thrusts in the Arunachal Himalayas. In the Himalayan belt, the crystalline, meta-sedimentary and sedimentary rocks are subjected to thrusts. Three of these thrusts are often referred to in literature, though the existence of a number of such thrusts is recognised (see Geological Map of GSI and the Tectonogeological map of Nandy in his book *Geodynamics of Northeast India*, 2001):

1. The Main Boundary Fault
2. The Main Central Trust
3. The Mishmi thrust

The Main Boundary Fault, though not visible, can be inferred from the wall-like height of the Lesser Himalayas when seen from the northern margin of the

Brahmaputra plane. The lower part of the fault plane covered by the rocks of Siwalik which rise to a height of over 2,000 m ASL, juxtaposed to the Gondwana rocks of Permo-Carboniferous period which at places override the Tertiary molasses known as Siwalik, which are largely Neogene formation. The eastern extremity of the Himalayan region is marked by Mishmi thrust North-East, of which are the unclassified crystalline rocks dipping North-East. The Mishmi thrust and the litho-units beyond the North-East present a different tectonic province. The Mishmi thrust is normal to the Main Central Thrust and Main Boundary Fault. While the former is aligned NW–SW the rocks dipping North-East, the MBF and the MCT are aligned roughly NE–SW and the rocks dip north-west-ward.

3.3.3 The Schuppen Belt of Nagaland

Nowhere in the North-East region, the compressive forces have made so much of an impact as in Nagaland. While the entire Tertiary basin has been compressed into a series of folds and faults, the schuppen belt of North-East Nagaland, extending from Mokokchung, Wokha and further south up to Kohima, has been subjected to excessive compression. A series of thrusts have resulted in land slices of imbricate structure in a width of about 30 km with scarp and recumbent beds. The steep scarps are facing north-west-ward overlooking the Brahmaputra valley for over 300 km. These thrusts involve the rocks of Disang, Barail and Tipam series, though because of thrust the oldest rocks of Disang series are seen at the top. The crustal shortening because of these thrusts is estimated to be between 150 and 300 km.

3.3.4 The Eastern Hills of Nagaland, Manipur and Mizoram

All these states are marked by north–south aligned anticlines and synclines, represented by ridges and valleys. Here the Palaeocene rocks, the Disang group of Eocene and the Barail group of rocks of Oligocene, have been folded into parallel or subparallel series of anticlinal ridges and synclinal valleys, confined within two major tectonic zones, viz. the Haflong–Disang thrust to the west and the ophiolite sedimentary thrust boundary to the east. Usually in Nagaland, the anticlines are narrower and sharp, and the synclines are broad and rounded.

According to Nandy (1983), due to sea floor spreading along the Carlsberg ridge, the Indian plate got subducted below the Shan–Tenasserim block to the east of Naga–Chin–Arakan suture, since Eocene times, in an oceanic/island arc/continental crust setting. This eastward movement of the Indian plate was helped by strike-slip movements along east–west-trending Himalayan faults and thrusts, the Dauki fault and along the NW–SE-trending faults such as Mishmi, Lohit thrust, Kopili lineament and Padma and Teesta lineament.

From west to east, the alternate arrangement of anticlines and synclines is as follows:

1. Mao anticline suture running along Dikhu river course, east of Mokokchung, flanked by a synclinal suture to the west, known as Kohima–Wokha–Mokokchung syncline.
2. To the east of Mao anticline is the Zunheboto-Longkin syncline that extends southward into Khararang syncline in Manipur.
3. Further east a major anticline passes adjacent to the course of Thoubal and Laini rivers in Manipur and extends North-East-ward along the Tezu river in Nagaland.
4. Further east there are two more synclines noticed in Manipur. These are Ukhrul–Lambul and the other to the east through Lunghar, Langdang and Shandhak.

3.3.4.1 The Anticlinal Hills of Tripura and Mizoram

The Neogene sedimentary pile of roughly 4,000 m thickness in Tripura and 7,000 m in Mizoram has been folded into mountains. Baramura, Longtarai, Jampui and Sakhan ranges are all box-shaped anticlines. The east and west Manipur Hills are a complex of anticlines and synclines. But Vangaikano on the southwestern border of Manipur and the Bhuban Hills on Manipur Tripura border are anticlinal ridges.

3.4 Geological Provinces of North-East India

Nandy (2001) has divided North-Eastern India into six geological provinces, viz. (1) Eastern Himalayan collision belt, (2) diorite–granodiorite complex of Mishmi block, (3) Indo-Myanmar mobile belt, (4) Meghalaya and Mikir Hills plateau, (5) Brahmaputra valley and (6) Bengal basin, covering the whole of West Bengal and Bangladesh, with Cretaceous to recent sediments.

The present author has broadly followed the same system but giving it a more physiographic and lithological appearance. The present author has taken into consideration the relief features and their alignment besides their lithological characteristics and tectonic origin. Thus, there have emerged five easily understandable geological provinces.

3.4.1 The Archaean Plateau of Meghalaya

The Meghalaya plateau, an Archaean gneissic complex, is geologically, the oldest part of the North-East, characterised by subsequent granitic intrusion and some meta-sedimentaries, like Shillong rocks. Enjoying a greater degree of tectonic stability,

Table 3.1 Tertiary and Quaternary stratigraphic sequence in West Siang district

Quaternary		Terraces and other deposits		
	Upper Siwalik	Kimin formation	2,850 m	Alternate sequence of conglomerate, sandstone and pebbles
Tertiary	**Middle Siwalik**	Subansiri formation	4,000 m	Medium to coarse bluish-grey loose friable sandstone
	Lower Siwalik	Dafla formation	4,200 m	Medium coarse-grained to bluish coarse-grained contact
	M B F	Tectonic contact		
Permo-Carboniferous	**Gondwana**			

Source: ONGC (GSI-Special publication-23, 1889:18)

much of the plateau has stood above the Tertiary sedimentation, except very small patches on its south and southeastern fringe. Its outlier, the Karbi-Anglong plateau (Mikir Hills), shows similar characteristics with their gneissic rocks.

3.4.2 The Himalayan Physiographic and Lithological Province

Much of Arunachal Pradesh is occupied by the Himalayan mountain ranges, the Lower, Lesser and Greater Himalayas, separated from each other by thrusts. Lithologically, the mountains are composed of crystalline rocks, Proterozoic metamorphics, high-grade schists, quartzites and multiple unclassified Himalayan formations of late Proterozoic and early Palaeozoic in age. The southern edge of the Arunachal Himalayas is marked by a thin wedge of Permo-Carboniferous rocks. The entire Himalayan zone is deeply incised by north–south-flowing streams. The foothills (Siwaliks), laterally attached to the Permo-Carboniferous southern edge of the Himalayas in Arunachal Pradesh, are composed of Neogene rocks. The Siwaliks are composed of shales, sandstone and even conglomerates, in different parts of the state. The eastern Arunachal Pradesh shows traces of Eocene marine rocks.

There is a broad similarity in the sedimentary sequences, between the MCT (Main Central Thrust) in the north and the MBF (Main Boundary Fault) in the south, extending from West Kameng district in the west to East Siang district in the east. There is, however, no uniform nomenclature. In the West Siang district, the stratigraphic sequence of Tertiary and Quaternary is as follows (Table 3.1). The Neogene rocks of Siwaliks in Arunachal have been classified into three principal formations.

The axial region of the North-East is the Brahmaputra plain, both sides of which are occupied by mountainous relief. With a height below 150 m ASL, it is covered with ancient and present alluvium, the flood plain and its terraces.

3.4.3 The Mountainous Patkai and Naga Hills and Their Extension into Barail Range

The Patkai and Naga hills, joining the Barail range, in their southwestern extension and rising to heights ranging from 1,500 to 2,000 m ASL, form the principal divide between Brahmaputra valley in the north and the Barak valley in the south. These ranges are the uplifted mass of Palaeocene (Eocene and Oligocene) sediments, subjected to thrusts from the southeast. A series of low-angle reverse faults have produced a series of scarps and uplands. The thrusts are more numerous in the western part of Nagaland, giving rise to an imbricate structure that characterises a Schuppen belt. Mineralogically, this belt is important as most of the Eocene–Oligocene coal comes from this belt. Over 98 % of the coal in Assam occurs in the Barail rocks of Oligocene period. The famous Margherita–Ledo–Tipang Pam belt, commonly known as Makum coalfield, is associated with this mountainous belt. These ranges of the North-East region are traversed by transport routes, from north to south.

3.4.4 The Mizoram – Tripura Region of Folded Rocks

These two states (Mizoram and Tripura) are marked by parallel and subparallel longitudinal folds in Mio-Pliocene rocks, giving rise to a north–south alignment of mountains and valleys. According to Nandy (1983), there are 15 major long, arcuate anticlines and synclines tending NNW–SSE to NNE–SSW in the belt. The folds have convexity towards the west. The Atharamura, Longtarai and Machamura ranges of Tripura are the flat-crested anticlines. A higher degree of compression towards the east has led to sharp-crested mountains in Mizoram.

3.4.5 Indo-Myanmar Plate Boundary, Plate Collision and the Plate Subduction Zone

The eastern Indo-Myanmar international border is marked by plate boundary and a collision zone between Indian and the Burmese plate. The subduction of the Indian plate under the Burmese plate has given rise to a complex of geomorphic features

typical of a subduction zone including the 'meta-sedimentary and basic complex of Nagaland' seen in the high mountain with Saramati peak (3,826 m ASL) and a narrow band of ophiolite (Das Gupta and Biswas 2000:fig-12). The eastern margin of Nagaland and to some extent even Manipur carry patches of ophiolite of Cretaceous–Palaeogene period.

3.4.6 The Brahmaputra Valley

The 60–70-km-wide alluvium-filled valley of Brahmaputra lies over a crystalline basement that is 5,000 m below the present level of the river. The 5,000-m-deep sedimentation consists of Barails of Oligocene period, with a thickness of approximately1,000 m, lying directly over the crystalline basement, overlain by Tipam deposit of Pliocene age. The Barails gradually thin out towards the west and the north-west, while the overlying Neogene deposits, principally Tipams, increase in thickness from 3,000 m in the southeast to 3,500 m in Majuli island and over 5,000 m further north-west (Das Gupta and Biswas 2000:figs 24–28). Thus, for long, during the Palaeogene period, the Brahmaputra valley zone was marked by marine sedimentation, and with slow uplift it may have been exposed and received even fluvial deposits.

The river Brahmaputra was initiated only after the rise of the Himalayas. The early sediments derived from the uplifted Himalayas were deposited in the foredeep in the frontal zone of the mountain, subsequently uplifted to form the Siwaliks. The continued uplift and a pluvial climate that necessitated the runoff to dispose of the rainwater gave rise to a number of streams, including the Brahmaputra. The Brahmaputra and its tributaries built the present alluvial plain during the Quaternary, including its terraces and flood plains.

One may summarise the litho-structural base of North-East, as a complex of three principal geological units: an Archaean gneissic block of Meghalaya and Karbi-Anglong; a Tertiary basin with an enormous mass of marine sedimentation, uplifted, folded and subjected to all kinds of compressional forces primarily as a result of the movement of Indian plate and its collision with Burmese and Tibetan plate, resulting into present configuration of tectonic forms and relief and the Himalayas, uplifted and thrusted against the Central Asian plate giving rise to the Himalayas and the attendant tectonic features.

The area has been seismically very active, as expected. The accumulated stress is periodically released causing convulsions in the crust of the earth. This has also affected the relief of the land. The present surface features of the region carry the imprint of structure and lithology as much as they are sculpted out of subaerial agencies.

Appendices

Appendix 3.1: Litho-Stratigraphy of Mizoram and Tripura and Some Parts South of Barail Range and Meghalaya Plateau

Period	Group	Formation	Composition	Type area
Recent	Alluvium			
Plio-Pleistocene	Duptila	*Duptila formation*	Loosely consolidated ferruginous sand, mottled yellowish clay pebble and cobble beds	Western Tripura
	~~	Unconformity		
Pliocene	Tipam group	*Tipam formation*	Medium to coarse grained, massive sandstone, silt stone, mottled clay	Named after Tipam river, W. central Tripura
	∞∞∞∞∞∞∞∞∞	Gradational contact		
Miocene	Surma group	*Bokabil formation*	Sandy shale, silty shale with sandstone	After Bokabil village in Hailakandi dt., Tripura and W. Mizoram
		Bhuban formation	Cross-laminated grey micaceous sandstone with shale and intra-formational conglomerate	After Bhuban range in West Manipur
	~~	Unconformity		
Oligocene	Barail group	*Ranji formation*	Massive sandstone with minor shale	
	∞∞∞∞∞∞∞∞∞	Gradational contact		
		Jenam formation	Predominantly argillaceous, thick sequence of shale embedded with sandstone	Western Manipur, Tamenglong district
	∞∞∞∞∞∞∞∞∞	Gradational contact		

(continued)

(continued)

Period	Group	Formation	Composition	Type area
		Laisang formation	Predominantly aerenaceous, thin and thick bedded sandstone with sandy shale	SW Nagaland
	∞∞∞∞∞∞∞∞	Gradational contact		
Lower to Middle Eocene	Disang group	*Upper Disang formation*	Predominantly argillaceous sequence of shale, silt stone with beds of sandstone	Upper Assam, Disang river area
		Lower Disang formation		Upper Assam, Nagaland, Manipur
Eocene	Jaintia group	*Kopili formation* (200 m)	Alternate dark grey shale and sandstone with marl & limestone	Meghalaya, after Kopili in the source region
		Shella formation	Limestone and sandstone	Meghalaya, S. and SE Khasi Hills
		Sylhet limestone, *Sylhet sandstone*		
	~~	Unconformity		
Upper Cretaceos or Jurassic	Ultrabasic intrusions	*Sylhet trap*		Meghalaya
Pre-Cambrian		*Shillong group*	Metamorphic quartzite and phyllite	Meghalaya
		Proterozoic granite		Meghalaya, Karbi-Anglong
		Gneissic complex and shists	Grey gneiss, pink gneiss	Meghalaya, Karbi-Anglong plateau

Reconstructed from:
1. Setty and Kisku (1990–1991)
2. Natani and Koshy (1990–1991)
3. Kisku and Muraleedharan (1991–1992)

Appendix 3.2: Litho-Stratigraphy of Nagaland

Geological period	Group	Formation	Composition
Recent	Alluvium		Silt clay, loose sand, gravel, boulders
Quaternary	Young Quaternary		Boulders, pebbles in yellowish sandy matrix
	Older Quaternary		Boulders, pebbles in yellowish sandy matrix
	~~	Unconformity	
Oligocene	Barail group	*Laisang group*	Grey and light grey to medium grain micaceous sandstone interbedded with siltstone and clay
	∞∞∞∞∞∞∞∞∞	Gradational contact	
Eocene to	Disang group	*Upper Disang*	Shales, clay nodules splintery shales, fossiliferous sandstone and greywacks
Upper Cretaceous		*Lower Disang*	Dark to grey phyllites, slates, slaty shales

Source: Anand Murthy and Chandra Madhav (1991)

Appendix 3.3: Litho-Stratigraphy of Nagaland

Oligocene	Barail group	Jenam formation	Thinly bedded, course grained sandstone, black splintery shale with coal occurring in streaks
	∞∞∞∞∞∞∞∞∞	Gradational contact	
		Laisang formation	Massive multi-storeyed coarse sandstone, carboniferous clay, mudstone, black splintery shale
	∞∞∞∞∞∞∞∞∞	Gradational contact	
Eocene	Disang group	*Upper Disang formation*	Grey shale, black splintery shale, silt stone, sandstone, concretionary nodules
	Jaintia group		

Source: Sahu and Venkastsamy (1991)

Appendix 3.4: Quaternary Stratigraphic Sequence in Arunachal Pradesh

Geological period			Thickness	Composition
Quaternary				Terrace deposits and alluvium
	Kimin formation	Upper Siwalik	2,850 m	Alternate sequence of conglomerate sandstone, fine grained sandstone, silt stone, clay with fossil leaf impressions
	Subansiri formation	Middle Siwalik	4,000 m	Medium to coarse grained, bluish grey loose friable sandstone with calcareous concretions
	Dafla formation	Lower Siwalik	4,200 m	Fine to medium grained sandstone, highly sheared, but more compact than overlying Subansiri formation
---------- Tectonic contact --------- MBF ----				
Permo-Carboniferous	Gondwana	Meta Volcanics		

After: Pandurang and Sengupta (1991)

References

Acharya SK, Ghosh SC, Ghosh RN, Shah SC (1975) The continental Gondwana group and associated marine sequences of Arunachal Pradesh (NEFA) Eastern Himalayas. Himal Geol 5:66–82

Acharya SK, Ghosh SC, Ghosh RN (1983) Geological framework of the Eastern Himalayas in parts of Kameng, Subansiri, Siang District, Arunachal Pradesh. GSI Misc Publ 43:145–152

Anand Murthy S, Madhav C (1991) Geology of parts of Phek, Tuensang & Zunheboto districts, Nagaland. GSI Rec 124, IV, pt. 94-34-94-53

Biswas JK, Angami JK (2001) Remote sensing studies in parts of Southern Meghalaya with special emphasis on Dauki fault zone. GSI Rec 133(pt. IV):7

Brown JG (1936) India's mineral wealth. OUP, Bombay

Burgohain AK, Surendranath M, Bora A (1996) Systematic geological mapping of North Cachar Hills and Cachar Districts, Assam. GSI Rec 128(pt. IV):18

Chakraborty S (1972) The Dauki lineament along the southern part of Meghalaya Plateau. GSI Misc Publ 31

Chakraborty DK, Verma RP, Gautam AM, Narsimha J (1987) Geological map of Northeastern part of India: a Landsat overview. GSI Res 115(pt. III and IV):65–74

Chattapadhay B, Ranjit KR, Srivastava SNP (1983) Structure and stratigraphy of the ophiolites and associated rocks around Chingai, Manipur East District, Manipur, India. GSI Misc Publ 43:167–175

Das Gupta AB (1977) Geology of Assam – Arakan Region. Quart J Geol Min Met Soc India 49:1–54
Das Gupta AB, Biswas AK (2000) Geology of Assam. GSI, Bangalore
Dasgupta S (1984) Tectonic trends in Surma Basin and possible genesis of folded belt. GSI Rec 113(IV):58–62
Evans P (1932) Tertiary succession in Assam. Trans Min Geol Inst India 27(3):155–260
Evans P (1964) Tectonic framework of Assam. J Geol Soc India 5:80–96
Ganguly S (1975) Tectonic evolution of the Mizo Hills. Bull Geol Min Met Soc India 48:28–40
Ganju JL (1975) Geology of Mizoram. Bull Geol Min Met Soc India 48:17–26
Geological Survey of India (1989) Recent advances in the study of Tertiary stratigraphy of Northeast India: a critical resume. GSI Spl Publ 3:1–23
Geological Survey of India (2000) Seismotectonics atlas of India. GSI, Calcutta
Gupta HK (1974) Some seismological observations and tectonics from Hindu Kush to Burma Region. Himal Geol 4(pt. I):465–480
Handique GK, Sethi AK, Sharma SC (1989) Review of Tertiary stratigraphy of Northeast India. A critical resume. GSI Spl Publ 23:1–23
Janardhan K, Gohain BN (1991) Quaternary geology and geomorphology of Brahmaputra valley in parts of Marigaon and Nagaon Districts Assam. GSI Rec 124(pt. II):41–44
Joshi RC, Rawat AS (2004) Morphotectonic observations: a case study from the outer Eastern Himalaya along main boundary thrust in between Ranga and Dikrong River, Arunachal Pradesh. Arunachal Univ Res J 7(2):35–46
Kayal JR, Arefiev SS, Barua S, Hazarika D, Gogoi N, Kumar A, Chowdhury SN, Kalita S (2006) Shillong Plateau earthquakes in Northeast India Region. Complex tectonic model. Curr Sci 91(1):109–113
Kisku SR, Muraleedharan C (1991–1992) Geology around Oinamlong and Atengba, Tamenglong district and Jiribam subdivision, Manipur. GSI Rec 126(4):42–44
Krishnan MS (1960) Geology of India and Burma. Higginbothams (Pvt.) Ltd, Madras
Kumar G (1997) Geology of Arunachal Pradesh. GSI, Bangalore
Kunte SV, Ganju JL, Dutta NK (1983) Geology and structure of the Tertiary belt between Bargang and Pachin Rivers, Arunachal Pradesh. GSI Spl Publ 43:124
Namgain VD (1991) Arunachal Pradesh regional geology division: an overview. GSI Rec 124(pt. 4):1–5
Nandy DR (1972) Style of folding in the Mio-Pliocene of Tripura and Mizoram area and possible role of basement dislocation fabric. GSI Misc Publ 1:31
Nandy DR (1980) Tectonic patterns in Northeastern India. Indian J Earth Sci 7(1):103–107
Nandy DR (1983) The Eastern Himalayas and Indo-Burman Orogeny in relation to Indian plate movement. GSI Spl Publ 43:153–159
Nandy DR (2001) Geodynamics of Northeastern India and the adjoining region. ABC Publications, Kolkata
Nandy DR, Gupta DD, Sarkar K, Ganguly A (1983) Tectonic evolution of Tripura-Mizoram fold belt, Surma Basin, Northeastern India. Quart J Geol Min Met Soc India 55(4):186–194
Natani JV, Koshy JM (1990–1991) Geology around Nutanbazar-Dumbur-Rushyabari areas of Tripura South district, Tripura. GSI Rec 125(4):43–44
Oldham T (1859) On the geological structure of a portion of the Khasi Hills. Mem GSI I:99–207
Pandurang P, Sengupta CK (1991) Geology of Tertiary Rocks around Lakabali-Gurdo-Jirdo, West Siang District. GSI Rec 124(pt. IV):5–7
Pascoe EH (1973) A manual of geology of India and Burma. GSI Publ 3:1345–2017
Raju AV (1993) Assam–Meghalaya geological mapping: an overview. GSI Rec 126:13
Sahu NK, Venkastsamy (1991) Geology around Tuensang, Chessore, Chingtang Saddle and Longleng Areas of Tuensang district, Nagaland. GSI Rec 124(IV):81
Saikia MM (1986) Seismic activity in Northeastern region of India. In: Proceedings of symposium, earthquake prediction: present status, Department of Geology, University of Pune, Pune, 10–11 July 1986, pp 223–233

Sale HM, Evans P (1937) Geology of Assam Arakan Region. Geol Mag 77(5):337–362
Sarma H, Chatterjee B, Jha N, Gill PS (1991) Geology of parts of West Garo Hills District, Meghalaya. GSI Rec 124(pt. IV):52–57
Setty SRK, Kisku SR (1990–1991) Geology around Tamenglong and Khongsong areas of Tamenglong district, Manipur. GSI Rec 125(4):35–36
Sridevi J (2004) Estimates of plate velocity and crustal deformation in the Indian subcontinent using GPS geodesy. Curr Sci 86(10):1443–1448

Chapter 4
Relief Features of North-East India

Abstract North-East India, occupying the extreme North-East corner of the country, is largely a mountainous territory with two-thirds of its area occupied by hilly and mountainous terrain. It is like an amphitheatre, surrounded by the Himalayan ranges on the north, the Indo-Myanmar peripheral chain of hills on the east, and the hills of Mizoram and Tripura on the south and opening out to the west in the valleys of the river Brahmaputra and Barak. The region presents an enormous amplitude of relief, with heights ranging from 50 m ASL in Brahmaputra valley to 7,000 m ASL in the Himalayan borderland. The eastern hilly region, characterised by a series of parallel and subparallel north–south-trending ridges and valleys, lies on the Indo-Myanmar plate boundary on the east and is separated from Brahmaputra valley by Naga–Disang thrust on the west. The north–south alignment of low hills continues in Mizoram, lying on the Myanmar border, and in the state of Tripura, which shares its international border with Bangladesh. The western part of Tripura is a plain, drained by the west-flowing streams that join the river Meghna in Bangladesh to find their way to the Bay of Bengal. The region is seismically active, and the plains of Assam suffer frequent and sometimes most intense floods that cause huge loss of life and property.

4.1 Introduction

North-East India, commonly known as the hilly North-East, consisting of seven contiguous states (Arunachal Pradesh, Assam, Nagaland, Manipur, Mizoram, Meghalaya and Tripura) and one non-contiguous state of Sikkim, added later on, for the purpose of development administration, is essentially a hilly terrain. The flat alluvial plains are largely confined to Assam, part of Manipur and Tripura. The region, as a whole, has roughly two-thirds of its terrain classified as mountainous, less than one-tenth as a plateau and around 30 % as plains. The picture becomes clearer, if seen state wise (Table 4.1).

K.R. Dikshit and J.K. Dikshit, *North-East India: Land, People and Economy*, Advances in Asian Human-Environmental Research, DOI 10.1007/978-94-007-7055-3_4,

Table 4.1 Major terrain features of North-East India including Sikkim

Nature of terrain	Area in km^2	Percentage of the total area of North-East India	States included
Mountainous	165,241	63.30	Much of Arunachal Pradesh, Nagaland, Manipur, Mizoram, part of Tripura and Sikkim
Plateau	21,532	8.12	Meghalaya
Plains	75,406	28.74	All plains of North-East India
(a) Brahmaputra plain	56,195	21.43	Assam
(b) Barak plain	6,922	2.64	Assam
(c) Pasighat, Roeing and Namsai plain	3,250	1.24	Arunachal Pradesh
(d) Tripura plain	6,300	2.40	Tripura
(e) Imphal valley plain	1,843	0.70	Manipur
(f) West Garo–Brahmaputra plain	879	0.33	Meghalaya
Total	262,179	100.16	

Expressed regionally, some states have more than one type of terrain. A state wise statement, albeit crude, may give some idea about the nature of its relief (Table 4.2).

About two-thirds of the area of the North-Eastern states are mountainous. Some like Arunachal, Mizoram, Nagaland and Meghalaya and Sikkim have hardly any plains (Fig. 4.1). There are only two states, Assam and Tripura, which have more than two-thirds of their area occupied by low alluvial plains. Assam has the benefit of the two main rivers of the North-East, viz. the mighty Brahmaputra and Barak (also called Surma), flowing through its territory and forming in their middle- and lower-courses linear plains. Tripura plain, on the other hand, is the extension of Bangladesh plain and the flood plain of Meghna river. A small, yet noticeable, high-level plain formed by Imphal river at the centre of Manipur occupies around a tenth of the area of the state. The genesis of the plain may be controversial, and it cannot be exclusively ascribed to lateral planation or alluviation by Imphal river, yet it is a very flat and fertile plain, the rice bowl of Manipur. A small linear strip associated with Brahmaputra on the extreme western margin of Meghalaya is striking. Juxtaposed to Tura Hills and the plateau, it forms an agricultural support base of the state. Small patches of flat lands along riversides like Pasighat–Roeing–Namsai plain, formed in the area where Brahmaputra debouches from the mountains, or the Champhai plain of Mizoram can only be mentioned as plains without adding much to the economy of the region.

If one takes a cross section of terrain from north to south, the bold facets of relief are represented by the Eastern Himalayan ranges occupying almost the entire Arunachal Pradesh, east–west-oriented Assam plain with Brahmaputra furrow in the centre, the Barail range complex that forms the divide between Brahmaputra and Barak basin, the Cachar plain formed by Barak river and the Tripura plain. The eastern mountain rim forms a separate system, and the Mizoram–Tripura hills of mid- or late Tertiary origin form a separate physiographic province. In another

Table 4.2 Nature of the relief in the different states of North-East India

State	Type of terrain	Area in km^2	Percentage area occupied by a specific type of terrain	Location in the state
Arunachal	Mountainous	80,493	98.76	Much of Arunachal
	Plains	3,250	1.24	Pasighat
	Plateau	–	–	
Assam	Mountainous	15,322	19.54	Karbi-Anglong and N. Cachar hills,
	Plains	63,116	80.46	Brahmaputra and Cachar Barak plain, Karimganj and Hailakandi districts
	Plateau	–	–	
Nagaland	Mountainous	16,504	99.50	Much of Nagaland
	Plains	75	0.50	Dimapur plain
	Plateau	–	–	
Manipur	Mountainous	20,484	91.74	Much of Manipur
	Plains	1,843	8.25	Imphal plain
	Plateau	–	–	
Mizoram	Mountainous	21,081	100.00	Much of Mizoram like Champhai
	Plains	Small patches		
	Plateau	–	–	
Tripura	Mountainous	4,186	39.92	North-East Tripura
	Plains	6,300	60.08	Southwest Tripura
	Plateau	–	–	
Meghalaya	Mountainous	–	–	
	Plains	879	3.70	West Garo–Brahmaputra plain
	Plateau	21,550	96.30	Entire Meghalaya plateau

section, from Bhutan Hill across Brahmaputra via Guwahati cuts across the Meghalaya plateau. A 70-km-wide horst, standing at an average height of 1,500 m ASL and north of Bangladesh plain on the south, Meghalaya plateau, an ancient massif, is very prominent in the physiography of North-East India (Fig. 4.4b).

4.1.1 Physical Divisions of North-East Region and Facets of Relief

To describe the physical features of the region, one can distinguish the following natural divisions, all distinct from each other. From north to south, the following divisions can be seen (Fig. 4.2):

1. The mountainous Arunachal Pradesh – the Eastern Himalayas
2. The Brahmaputra plain

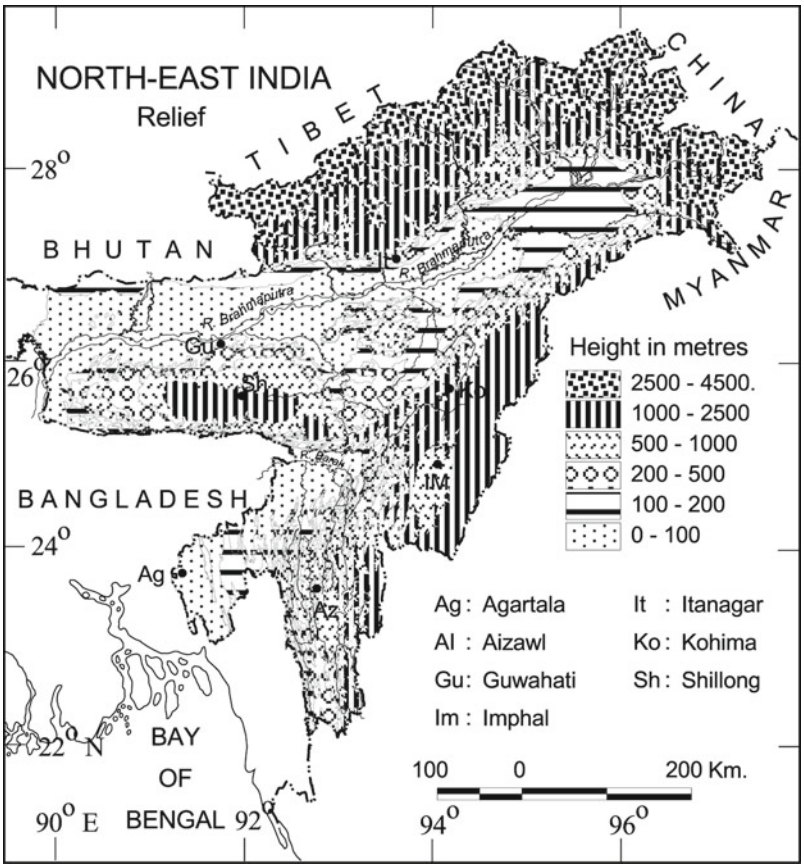


Fig. 4.1 Relief of North-East India: altimetric zonation

3. The longitudinal eastern Mountainous Division, divided into the states of Nagaland, Manipur and Mizoram
4. The Karbi-Anglong old gneiss complex – an outlier of Meghalaya
5. The Barail range – the Brahmaputra–Barak divide
6. The Meghalaya plateau
7. The Barak plain
8. The Tripura region – the hills and the plain

4.2 The Mountainous Arunachal Pradesh

Occupying almost one-third of North-East India, the hilly terrain of Arunachal occupies the space between Brahmaputra plain in the south and the Himalayan water divide in the north. The northern limit of this region forms a watershed

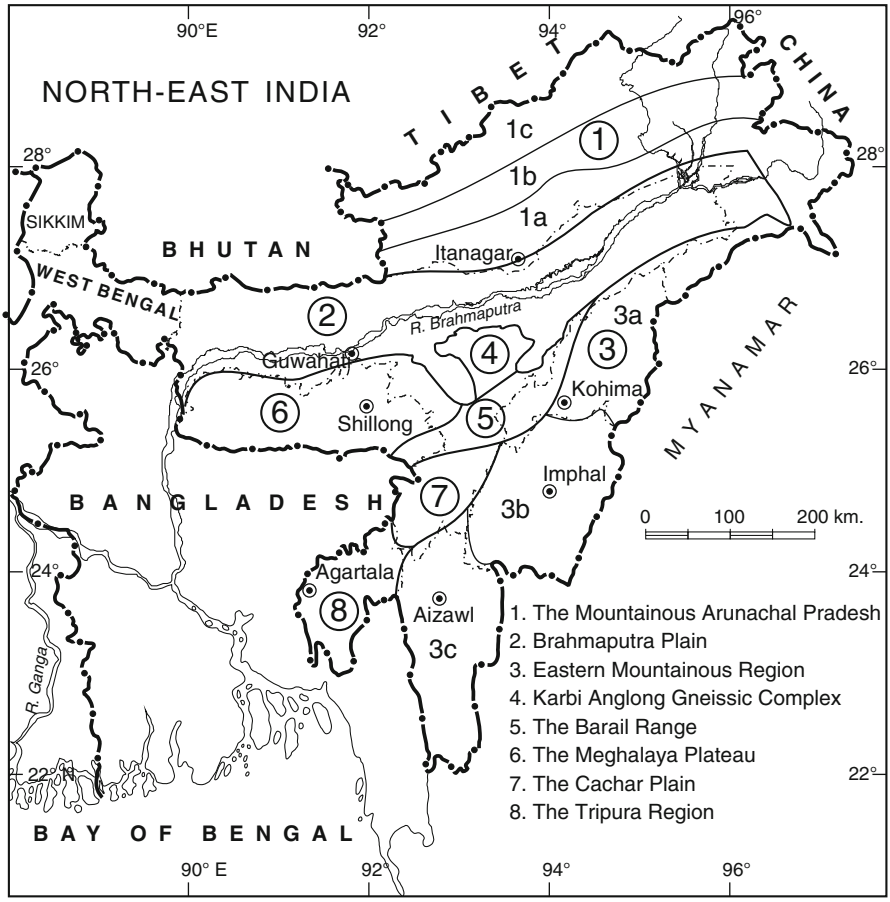


Fig. 4.2 Physiographic divisions of North-East India

between the upper Brahmaputra, flowing in Tibet, and the lower middle Brahmaputra flowing in mountainous India.

The mountainous terrain of Arunachal, about 500 km in length from the border of Bhutan in the west to Lohit river in the east and about 150 km wide from north to south, is characterised by a series of subparallel ranges, rising in stages from the edge of the Brahmaputra plain to about 1,000 m within a space of 40 km and to over 5,000 m at its northern limit. The terrain is dissected and pierced by a number of north–south-flowing deeply entrenched tributaries of Brahmaputra. The entry to the northern part, the badly dissected mountainous terrain, is only along the river valleys following the riversides, which also lead to district headquarters.

Tectonically highly mobile, this Himalayan belt consists of a series of northerly dipping thrust sheets, separated by east–west-trending thrust lines into three east–west physiographic divisions, from south to north. These are usually called the

Siwalik zone, the lesser Himalayan zone and the greater Himalayan zone. The Siwalik zone consists of low hills formed of sediments of the Miocene–Pliocene periods, derived from the erosion of the Himalayas. The Siwaliks are separated from the Brahmaputra plain by the Main Boundary Fault (MBF). North of the Siwaliks, the east–west zone is known as the Lesser Himalayas, higher than the Siwaliks in the south but lower than the Greater Himalayas further north. The Lesser Himalayan rocks are composed of a complex series of rocks ranging in age from Proterozoic in the northern part to a thin wedge of Gondwana rocks of continental as well as marine origin of Carboniferous–Permian age in the south. The Greater Himalayas, occupying a still higher northern zone, represent the highest ranges of the Himalayas and are composed of crystalline rocks, high-grade schists and occasional granite and gneiss. The Greater Himalayan zone, besides being the highest, is also the oldest part of the Himalayan complex. This is separated geologically from the Lesser Himalayas by the Main Boundary Thrust. The three tectonic divisions of Arunachal represent the three physiographic divisions of Arunachal Himalayas, viz. (1) the Siwaliks or the Sub-Himalayas, (2) the Lesser Himalayas and (3) the Greater Himalayas.

4.2.1 The Siwaliks (The Sub-Himalayan Terrain)

These represent the low hills not rising above 1,000 m ASL between Brahmaputra alluvial plain in the south and the Lesser Himalayas in the north. In the eastern part of Arunachal, the Siwaliks pinch out, and the Quaternary sediments are directly juxtaposed against the Proterozoic (Late pre-Cambrian) metamorphic and crystalline rocks over the Mishmi thrust. The narrow Siwalik belt, not exceeding 30–40 km in width from south to north and overlooking the Brahmaputra plain in the south, is composed of molasses, a kind of less-resistant sandstone of late Miocene or Pliocene period. Uplifted and eroded subsequently by a number of streams, the Siwalik Hills have assumed the appearance of series of semi-detached, forest-covered hills with narrow terraces on the valley sides which also provide sites for isolated settlements having few huts. The zone is known for shifting cultivation, and the destruction of forests in the process has given rise to many denuded hillsides devoid of forests. An area of heavy rainfall and thick forests, it is well known for its wildlife and has offered sites for national parks like Khaling Wildlife Sanctuary in Bhutan about 60 km north of Tangla, a railway station in Darrang district, or Namdapha Biosphere Reserve in eastern Arunachal Pradesh.

Seen from Brahmaputra valley, the Siwaliks are clearly recognised as a continuous belt forming the lowest step in the ascent on the complex Himalayan mountain chain and are often referred to as Sub-Himalayas (Photo 4.1). Access to the Lesser and Greater Himalayas is through the debouchure of the transverse streams which leave the mountains, opening out their courses, making a fan with low terraces on the sides to merge into the Brahmaputra plain.

Photo 4.1 A view of the Siwaliks seen from the 'Tarai' Assam plain

4.2.2 The Lesser Himalayas

About 50–100 km wide, the east–west running mountainous zone, called Lesser Himalayas, ranges in height from 1,000 to 3,500 m ASL. A series of ranges with a general east–west orientation, and separated from the Siwaliks by Main Boundary Thrust (MBT), are composed of a thin wedge of Lower Gondwana rocks of continental as well as marine origin, followed in the north by medium-grade schists all dipping northward. This zone of Lesser Himalayas is characterised by a number of parallel and subparallel transverse tributaries of Brahmaputra, emerging from the high Himalayas and joining the Brahmaputra in a wide open mouth where they invariably broaden their channels which become shallow, often carrying sandbars and islands, resembling those in Brahmaputra. The sudden transformation of the deep gorge-like valleys of these transverse streams into broad shallow channels reflects the incapacity of the trunk river Brahmaputra to transport further the sediment load brought by the tributaries, which is invariably dumped at their confluence.

The main north–south-flowing streams, counting from east, are Dibang that joins Brahmaputra where the latter debouches from the mountains, then comes Brahmaputra, to the west, known as Dihang or Siang; further west is Siyorn that joins Brahmaputra about 70 km above the latter's entry into the plain. Further west, Subansiri is the most important tributary of Brahmaputra. It has the largest course and the largest basin, larger than any other tributary of Brahmaputra in Arunachal

Photo 4.2 Incised valley of Kameng in Middle Himalayas

Pradesh. Subansiri has many tributaries, joining it from the west. Of these, Kamala with its tributary Kurung in the north and Ranga in the south are the main.

The Lesser Himalayas in western Arunachal is drained by Kameng river, also known as Bharali in its lower course, that joins Brahmaputra after collecting waters of its tributaries Tenga and Bichorn on the western flank (Photo 4.2).

The central Lesser Himalayan zone is characterised by a number of east-flowing streams, following the thrust planes, which have a gradient much less than the transverse streams and provide sites for linear settlements. To quote some illustrations, Ahui river joining Dibang, in Dibang valley district or Yang Sang Chu, flowing in a reverse direction, towards north-west joining the Dihang, in East Siang district, is a case of a river course aligned to lineaments. Similarly, Kamala-Kurung, one of the longest tributaries of Subansiri, Panejar and Dikrang, all tributaries or sub-tributaries of Subansiri river in Lower Subansiri district, follow courses which are, in many of their reaches, easterly oriented and transverse to Subansiri. This arrangement is also seen in the western part of Arunachal Pradesh in Kameng drainage basin where Bichon and Tenga, flowing from west to east and Kameng flowing east–west in its upper reaches, make a trellis pattern reflecting the role of east–west-oriented lineaments caused by a series of thrusts.

The Lesser Himalayas occupy almost half the territory of Arunachal. The main rivers are still incising the terrain and occasionally flow in gorges. Many of these tributary streams flow at an altitude of about 1,000 m, with valley sides rising abruptly to 1,500 m within a lateral distance of about 4–5 km and showing some upper convexity reaching the top of the divide at 3,000 m. The linear divides, rounded with hardly any trace of flatness, appear as peaks which vary in height from the source region in the northern part where they attain a height of 3,000 m, giving relative relief of 2,000 m, to around 2,000–2,200 m in the central part and about 1,200–1,500 m as one approaches the Siwaliks in the south. Most of the residual interfluves are covered with dense mixed jungle giving way to rhododendron as one reaches beyond 3,000 m. In the southern part, the rivers descend to a level where the valley bottoms are at 250–300 m with the closest interfluves, often NE–SW oriented, standing at 1,000 m, giving a much lower relative relief of 700 m.

4.2.2.1 Flat Depressions, Riverside Terraces and Marshes

An important feature of the mid-level Lesser Himalayan zone in Arunachal, particularly in its eastern part, is the presence of riverside flats and marshes at different levels. It is not easy to explain the occurrence of these small, flat surfaces not measuring more than a few km^2 in extent, strung along the streams. The most well known of which is the Harpoli plateau of the geologists or the Ziro intermontane basin of the geographers, aligned with Pangen–Kale river, a tributary of Panyor, which in turn is a tributary of Ranga river. Down Hapoli along the Kale river are other smaller flat terraces at Joram and Talo, where the fertile terraces barely 3 m above the river bank support settlements and patches of cultivation. Similarly, riverside flats resembling marshes are observed 40 km south of Seppa, the headquarters of Eastern Kameng district in western Arunachal. Aligned with Papju river, an eastern tributary of Kameng, is a marshy area about 25 km^2 in extent covered with tall grass or another marshy flat not too far from the former, aligned with Pasar river another tributary of Kameng, at 1,100–1,200 m ASL.

These flats filled with sediments, one imagines, are the remnants of Quaternary glaciers, which were capable of scooping depressions subsequently filled with fluvio-glacial sediments. Being very recent, these flats have not undergone much erosion and are being exploited for cultivation. These sediment-filled high-altitude flats can be explained only with reference to glacial movement.

Unlike the Siwaliks, which are deeply infested with diseases and wildlife, the Lesser Himalayas are healthier and provide better climate for human settlements.

The hills in the Lesser Himalayas are usually named after the tribes who inhabit the region, like Mishmi or Abor Hills in eastern Arunachal Pradesh, Dafla and Miri hills in the central part and Aka Hills in Kameng in western part.

The region receives 1,500–1,200 mm annual rainfall from summer monsoon. Along in the east, about 20 km west of Brahmaputra on Siyom, one of its tributaries, Daporijo on Subansiri, Ziro on a tributary of Pangen and Seppa on Kameng receive 2,374, 1,839, 1,476 and 1,703 mm of rainfall, respectively. The entire

Photo 4.3 Flat surfaces near Tawang, Upper Himalayas, nivation surfaces

belt of Lesser Himalayas, about 100 km in width from south to north and about 400 km from east to west, has a variable height from 1,000 m to 3,500 m ASL, is deeply dissected by north–south-flowing tributaries of Brahmaputra, is forest covered and is cool and wet in summer and cold during winter with occasional snowfall.

4.2.3 The Greater Himalayas

The northernmost part of Arunachal, a 50–60-km-wide zone running along the international boundary with Tibet, is what can be included in 'Greater Himalayas'. Ranging in height from 3,000 to 7,000 m, this is the source zone of most of the tributaries and sub-tributaries of Brahmaputra. Some of the major tributaries of Brahmaputra, like Subansiri and Manas, cut across the international border, extending their headwaters into the Trans-Himalayan zone (Photo 4.3).

The higher points of the Greater Himalayas are in most cases close to the international border, like Kangto Hill with a height of 7,089 m ASL, followed by Takpa Shiri (6,655 m ASL) and many others lying close to the border ranging in height between 5,000 and 5,500 m ASL with the exception of the source of Dibang in the east where the border ranges attain a height of 5,922 m. The area receives heavy

Table 4.3 Passes in the Greater Himalayas of Arunachal Pradesh

No.	Name of the pass	Height m ASL	Location
1.	Hpungan pass	3,072 m	Source of Dapha river a tributary of Noa Dihing river – Myanmar border
2.	Kumjwang pass	2,930 m	Lohit district, connecting Myanmar
3.	Diphu pass	5,130 m	Lohit district, south of Hkakabo Razi point (5,887 m), the highest point in Myanmar
4.	Du pass	5,233 m	Connecting Dong (in Lohit district) with Kibitho in Indian territory passing through Shama on the border, from where a proper road built by Chinese connects Dongchong and further Chayo
5.	Kaya pass	4,755 m	Dibang valley, eastern border 60 km due east of Anini
6.	Tsang Kang pass	–	Dibang valley district, eastern border
7.	Yongyap pass	3,962 m	Dibang valley district, northern border
8.	Andra pass	–	Dibang valley, western side
9.	Lusha pass	5,248 m	West Siang district
10.	Lamdo pass	–	25 km south of Lusha pass
11.	Shoka pass	–	45 km south of Lusha pass
12.	Tunga pass	–	West Siang district
13.	Migyitun pass	–	Upper Subansiri district, Nyuri with Tibet
14.	Tulung pass	–	West Kameng district
15.	Bum La pass	4,331 m	25 km southeast of Tawang
16.	Se La pass, not on border	4,249 m	Connects Bomdila with Tawang

rainfall, though not as much as the lower reaches. The northernmost 50 km of the ranges is marked by a sudden rise from about 4,000 m to over 6,000 m in the interfluve area. But wherever the major divides are breached by the headwaters of the streams, coinciding with the northern limit of the Arunachal Himalayas, lower heights are observed as in the case of Bum La (4,331 m), a pass about 20 km north of Tawang. In this sector, the sub-tributaries of Brahmaputra, like Tawang and Nyamjang, not only breach the divide but extend their catchment tens of km north of the international border. Similarly, Yongyap pass, about 60 km east of Brahmaputra, has a height of 3,962 m ASL.

There are a number of passes that connect the Greater Himalayas with the Tibetan plateau and eastward with Burma. Starting from east, the passes in the Himalayan ranges with their approximate heights and locations are given in Table 4.3 (Fig. 4.3).

West of 93°-30′ E longitude, the border ranges attain greater heights, most reaching above 6,500 m and some even exceeding 7,000 m in height. The Great Himalayan ranges between 92° and 93° East longitude are marked by two glaciers: Kangto glacier, named after the nearest settlement, occurs at 7,089 m ASL, whereas Takpa Shiri glacier, 50 km to the North-East, occurs at a height of 6,816 m ASL (Photo 4.4).

These upper reaches of the Himalayas are not inhabited except for very small settlements in the valleys.

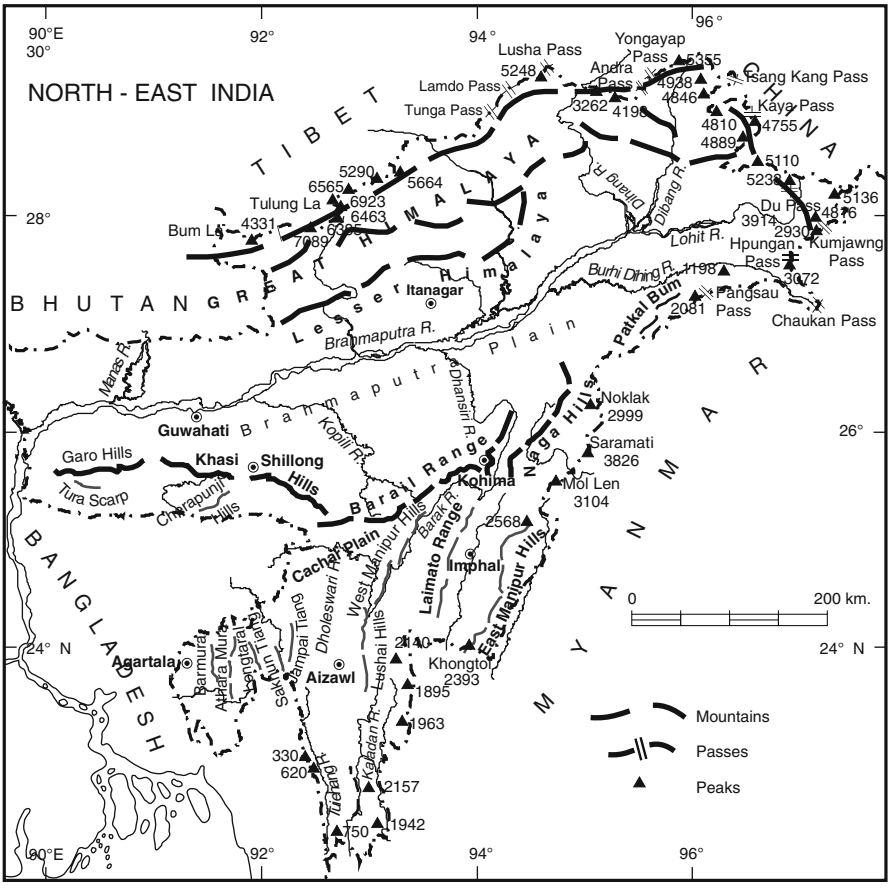


Fig. 4.3 Physical features of North-East India: mountains, passes, rivers and spot heights

4.3 The Brahmaputra Plain

The Brahmaputra plain is formed of a thick mantle of alluvium, overlying Miocene–Pliocene rocks, having a thickness of 5,000 m. The depression in which the river flows is formed by the collision of the Indian plate with the Tibetan plate during Palaeogene period, with its oceanic part undergoing subduction under the Tibetan plateau and forming the frontal trench, a zone of sedimentation, where a thick mantle of Tertiary sediments accumulated.

The plain around 600 km in length from Sadiya in the east to Dhubri in the west, the point where the Brahmaputra leaves Assam and enters Bangladesh, is not more than 80 km in width. Compressed between the Siwaliks of Arunachal in the north and Naga Hills, Karbi-Anglong highlands and Meghalaya plateau in the south, the plain occupies more than one-fifth of the area of the North-East India and more than

Photo 4.4 Se La pass at 4,249 m ASL, 40 km south of Indo-Tibetan border in West Arunachal Pradesh – 20 km southeast of Tawang (Photo April 2006)

70 % of the area of Assam state. Not surprisingly, many Assamese call it Assam proper. The Brahmaputra is the lifeline of the state and the Assam plain is its main granary. But the river is also a source of suffering as it invariably gets floods every year during monsoon, inundating a large part of the plain.

In its transverse section, the plain is marked by outer or higher river terraces generally used for tea plantation, the lower terraces, the most suitable site for paddy cultivation, locally called *rupit* land, signifying land where paddy is transplanted, followed by flood plains and *char lands*, which are often flooded during rains (Photo 4.5). A highly inefficient channel, with enormous width and not much depth, is incapable of carrying enormous amount of sediment during floods and dumps it on the flood plain. The river itself, a 5-km-wide expanse from bank to bank, presents variable aspect depending on the season. It presents an ocean-like appearance during floods engulfing a large swathe of land. In dry summer, it takes the form of a number of tortuous and shallow streams separated by sandbars and islands, temporarily inhabited by graziers with their cattle.

In its longitudinal profile, the river has an imperceptible gradient. Between Dibrugarh (111 m ASL), at the North-Eastern extremity of the plain and Dhubri (49 m ASL), the river loses only 65 m over a distance of over 600 km. The plain is constricted near Guwahati and Goalpara where the river has to cut through the gneissic hills of a type similar to the plateau of Meghalaya. The foothills of Bhutan on the north and the Meghalaya plateau on the south, compounded in its cross section with isolated gneissic hills, have caused a slight shrinkage of the plain, causing

Photo 4.5 The Bhils water body resulting from cut-off in Brahmaputra plain 25 km north west of Guwahati

more water logging and marshy conditions down Guwahati, in the districts of Nalbari, Barpeta, Kokrajhar and Dhubri.

4.3.1 Geomorphic Characteristics of the Plain

Geomorphically the Brahmaputra plain has three principal units formed by two terraces and a flood plain. These are recognised by Janardhan and Gohain (1991) as follows:

1. Higher Pleistocene terrace (T-3) – 60–100 m. This surface occurring in patches and occupying the outer margin of the plain is dissected and has undergone some degree of oxidation. This surface is covered with a metre-thick brown silty clay with fine sand and is the favourite site of tea gardens. This is the oldest Quaternary formation.
2. The lower and younger terrace (T-2) – This terrace (Lower Holocene) is separated from the older terrace (T-3) by a 5–10-m-high scarp. It is a featureless paleo-plain of Brahmaputra marked by paleo-channels and oxbow lakes. This surface is covered with grey silty clay and is extensively utilised for cultivation. This surface is affected only during exceptional floods.
3. The present Holocene flood plain (T-1) – This is a depositional surface characterised by back swamps and *bils*. It is usually flooded during the rainy season and is covered with silty clay. The flood plain is cultivated seasonally and is covered with grass.

A similar study made by Surendranath and Sharma (1991) evokes a hypothesis of fill and cut terraces developed during four phases of depositional activity, from early Pleistocene to Holocene, in the foredeep between Arunachal Himalayas and the Meghalaya plateau. What is certain, however, is the existence of a higher and lower terrace and a flood plain, on either side of Brahmaputra.

About one-fifth of the area, two-thirds of the population and more than three quarters of the economic activities of the North-East are centred in Assam.

4.4 The Eastern Mountainous Region

The eastern mountain chain, extending from Brahmaputra south over Nagaland, Manipur and Mizoram – a distance of more than 700 km – girdles the region from the east and forms the international boundary with Myanmar. This chain of mountain, starting from Patkai Hills, also known as Patkai Bum in the North-East, gradually rises to a higher level in Nagaland, where it is known as Naga Hills, extending further south till the end of Mizoram, where it is known as Lushai Hills. Both, Naga and Lushai hills, are known after the tribes of the same name.

The mountainous chain has a number of parallel or subparallel ranges intervened by river valleys which have a general north–south orientation following the hill ranges. The region represents a plate margin where the Indian plate, colliding with the Burmese plate, is subducted under the latter, thus giving rise to all the tectonic, lithological and relief features common with the contact zones of the tectonic plates. The entire relief of this region is produced by the effects of plates' collision and is guided by underlying structure. In both, Nagaland and Manipur, the alignment of the hill ranges and the rivers is north-east–southwest, and the mountainous terrain lies between north-flowing Dhansiri and south-flowing Barak on the west and the Chindwin river of Myanmar on the east. A comparison can be drawn between the Indo-Burmese plate boundaries with the Indo-Tibetan plate boundaries. One may compare Chindwin, as the Chindwin suture, with the Brahmaputra suture on the Tibetan plateau, and the north–south-flowing streams of Nagaland carry a semblance of Brahmaputra trough south of the Arunachal Himalayas. Though very similar in nature, each unit, viz. Nagaland, Manipur and Lushai hills (Mizoram), has its own characteristics and is therefore treated separately.

4.4.1 Nagaland Highlands

No region in the eastern mountainous terrain carries the signature of events following the collision of India and Burmese plates as clearly as Nagaland.

The collision of the Indian plate with Eurasian plate of Burmese micro-continent, during the Eocene, caused the uplift of the Indo-Burman range of which Nagaland is a part. The Oligo-Miocene evolved west of the uplifted Indo-Burmese range,

which was filled up with sediments. Later these molassic sediments were uplifted into open upright folds giving linearity to the belt. The north-east–southwest folds were further subjected to compression and basement shortening which resulted into faults and thrusts. Thus, emerged a series of anticlines and synclines confined within two major tectonic zones, viz. Disang–Haflong thrust to the west and the ophiolite sedimentary thrust boundary to the east (GSI 1989).

A series of folds plunging north-east-ward have compressed anticlines and broad synclines. The following anticlines and synclines, formed in Miocene and Pliocene rocks, are contiguous and more prominent. From west to east, the following synclines and anticlines have been observed:

1. The synclines known as Kohima syncline, Wokha syncline, Mokokchung syncline and Wakching syncline – all ranged in the western part of Nagaland in an NNE–SSW alignment – are flanked on the west by Naga–Disang thrust, which has produced an escarpment.
2. Mao anticline which runs east of Mokokchung, running along Dikhu river.
3. Further east is Zunheboto–Longkin syncline.
4. East of Zunheboto–Longkin syncline is a major anticlinal axis passing along the drainage of Thoubal and Laini rivers in Manipur and extends north-east-ward along the Tizu river in Nagaland.

The western part of Nagaland bordering Assam valley is characterised by a Schuppen belt, a belt marked by overthrusts. It is a narrow linear belt of imbricate thrust slices for a distance of 350 km along the flank of Naga–Patkai ranges (Mather and Evans 1964). Mather and Evans postulated that this belt comprises eight or more overthrusts along which the Naga Hills have moved north-west-ward.

The orientation of the folds has guided the drainage of Nagaland, and most rivers have an SW–NE alignment. Yet it has to be pointed out that the anticlines don't necessarily represent the hills nor the synclines form the stream courses. Because of excessive folding thrusts, there has been a considerable inversion of relief. The relief of Nagaland varies from west to east. From about 200 m ASL, the height at which the west-flowing rivers Dikhu, Jhanzi, Dismal or Diyung enter the Brahmaputra plain to 3,837 m at Saramati on Myanmar border on the east, there is a gradually rising hilly terrain. Folded and dissected, the terrain displays a series of ranges and valleys, as much as highlands and plateaux all aligned NE–SW to conform to the structural trends. The lowest part of the state, the land *below 600 m* ASL, is confined to a narrow strip along the western border of the state, which is not wider than 20–25 km in any part. Such areas of land below 600 m ASL, representing the flood plain and the low terraces, could also be found along the deeply incised valleys of Diyung and its tributary Chubi–Zukhu or river Tizu and its tributary Zungki flowing through Kiphire and Phek districts of Nagaland. About 20 % of the land of Nagaland is below 600 m ASL.

As the height of the land increases east–southeast-ward, there is a broad altitudinal zonation:

Land below 600 m ASL
Land between 600–1,200 m ASL

Land between 1,200–1,800 m ASL
Land above 1,800 m ASL
Land below 600 m ASL is already described above.

4.4.1.1 The 600–1,200 m-Altitudinal Zone

The altitudinal *zone between 600 and 1,200 m*, like the previous divisions, cuts longitudinally, from NE to SW, the entire stretch of Nagaland and extends further south in Manipur, covering the latter's northern and western parts. The southwestern hilly region of Nagaland is the continuation of Barail range, both geologically and topographically, and is marked by a central SW–NE ridge that runs through Peren (1,423 m) and Pulami (2,066 m) further north, terminating into Japvo Mt. (3,015 m), the highest peak in western Nagaland. The extension of the ridge further east, with altitude exceeding 2,000 m at many places, makes a water divide and a boundary between Nagaland and Manipur and is pierced by streams from both sides north and south. The headward erosion caused by streams has cut passes that link Nagaland with Manipur.

The central ridge, seen in residual isolated plateaux, runs through Kohima (1,418 m), the capital of Nagaland, situated in the shadow of Japvo peak (3,015 m) which represents the highest point in the North-East extension of Barail range. Most of the important towns in western Nagaland like Kohima, Tseminyu (1,537 m), Wokha (1,976 m) and finally Mokokchung (1,402 m), further north, lie on this ridge. Structurally, the ridge is formed over a syncline, a clear case of inversion of relief. This also suggests that river Diyung flowing from North-East to southwest, running about 10 km west of Wokha, and the river Jhanzi flowing in the opposite direction from southwest to North-East, making a perfect alignment, are flowing on the eastern flank of an anticline or the western flank of a broad syncline. Kohima–Wokha–Mokokchung ridge, extending further north till Wakching (1,300 m) through a structural syncline, forms the divide between the west-flowing Diyung, Jhanzi and Dikhu, all tributaries of Brahmaputra, and the east- or southeast-flowing streams like Tizu, which join Chindwin in Myanmar. The North-Eastern part of Nagaland, the districts of Mon and northern Tuensang, is drained northward into Brahmaputra. Thus, about 30 % of the drainage of Nagaland finds its way into Chindwin river. The road running from Mokokchung to Tuensang is an approximate divide between the northerly drainage flowing into Brahmaputra and rivers finding their way to Chindwin on the east.

4.4.1.2 The 1,200–1,800-m Zone

The eastern part of Nagaland is much higher than the western half. The terrain rises gradually from the centre eastward, till the maximum height is reached on India–Myanmar border, which is also the divide between Brahmaputra flowing to the Bay of Bengal and Chindwin joining Irrawaddy that finally enters the Andaman Sea, making a delta on the shelf of Martaban. On the India–Myanmar border, there is a

chain of high peaks like Elkhye (2,505 m, 26° 25′ N), Pesao (2,634 m, 26° 23′ N), Timpong (2,391 m, 26° 15′ N), and Wailam Nawkun (2,767 m, 26° 12′N). South of 26° 15′ N, the divide on the Indo-Myanmar border rises further in height reaching 3,471 m (26° 0′N) at Hankyun Khe, finally reaching Saramati (3,837 m, 26° 45′ N), the highest peak in the eastern mountainous rim on the Indo-Myanmar border. This mountainous divide continues all along the Indo-Myanmar border, making an effective frontier zone. The peaks lying on the divide were used to delineate the international border between India and Myanmar.

4.4.1.3 The 1,800–2,400 m-Altitudinal Zone

There is hardly a continuous zone that is above 1,800 m ASL, but there are a few ridges moving from North-East to southwest occupying the interfluves of the tributaries of Tizu river in the south and Dikhu and Yangmum and Sinyang-Tejang rivers on the north. The average height of these ridges where they appear as prominences in the landscape varies between 2,000 and 2,500 m ASL. While they become more prominent in the south extending into Manipur, they are much lower in the northern part to correspond to the north-plunging folds. The 2,000 m ridge's axial alignment passes just west of Tuensang.

4.4.1.4 The Land Above 2,400 m

The *land above 2,400 m* ASL in Nagaland is confined to two patches. The first of these is a linear 10–15-km-wide and 35-km-long zone along India–Myanmar border of which the Saramati, the highest peak, forms the central part. The second highland, over 2,400 m ASL is represented by the easterly extension of Barail range, ending at Japvo peak (3,015 m ASL) about 12 km southwest of Kohima. The Japvo hill complex, though badly dissected, extends into north-western part of Manipur where it has several peaks reaching above 2,400 m, Phepu (2,859 m), Tempu (2,995 m), south of Japvo, lie on Nagaland–Manipur border. The area centred around these peaks has a radial drainage, and the tributary streams descending from the hill complex make falls of around 25 m. The Angola peak in Peren district also has given rise to a radiating drainage, flowing to Dhansiri on the west and Barak on the east.

The Naga highland is separated from Brahmaputra plain by the escarpment of a thrust known as Naga–Disang thrust. From the western border, there is an abrupt rise, and structurally the entire area lies in a different physiographic province. The highland represents a series of alternate anticlines and synclines, aligned NE–SW, all culminating into the high peaks on its eastern margin, which is also the result of the pressure applied on the molassic sediments deposited in the geosynclinal sea, formed by the contact of the Indian and the Burmese plates. The rise from west to east is in steps and not gradual, and the relief is accentuated by deeply incising rivers usually moving north joining the Brahmaputra, or flowing south to join the

Chindwin in Myanmar. Relief inversion is common, and prominent heights on which Mokokchung and Kohima are located lie in the synclines. At some places, the landscape appears to resemble cuestas with asymmetrical valleys and uplands.

4.4.2 The Manipur Hills and Lowlands

South of Nagaland are the Manipur Hills, named after Manipur state. Not very dissimilar to Nagaland, the western part of Manipur is made up of Barail formation of Eocene–Oligocene period. The Barails are mostly composed of sandstone and occasional shales. The central belt is occupied by a little older Tertiary formation of Eocene period. Further east is a melange of Cretaceous–Pliocene formation, with occasional occurrence of ophiolite, characteristic of the contact zones of tectonic plates. Without change, the NE–SW orientation of Naga Hills continues in Manipur where mountain ranges and rivers are aligned in an NE–SW direction.

One may divide Manipur into five physiographic units:

1. The Northern hills
2. The Western hills
3. The Eastern hills
4. The Southern Mountainous margin
5. The Central lowland of Manipur – the Imphal high-altitude plain

4.4.2.1 The Northern Hills

The northern part of Manipur is extremely hilly and structurally a continuation of the NE–SW-oriented Naga Hills, occupying two districts of Senapati on the north-west and Ukhrul on the north-east. The territory is drained by southwest-flowing Barak river in the west and North-East-flowing river Laini Lok and southwest-flowing Iril river in the east. The headwaters of the latter two rivers are separated by a divide formed by an NE–SW-oriented central ridge joining a number of peaks with variable heights often exceeding 2,000 m ASL. Other parallel and subparallel ranges separated by rivers have an altitude of over 1,000 m. The western part of the northern hilly region is the extension of Barail range topographically and geologically. Barails, geologically an Oligocene formation, lie at some places over Disang, an Eocene formation of earlier age. What is certain is that from west to east there are several anticlines and synclines arranged alternatively, though not necessarily with ridges and river valleys in places, the synclines appear in a ridge form suggesting an inversion of relief as was the case in Nagaland. The area is highly disturbed. The Barak river in the western part, flowing in a synclinal valley, occasionally runs in a gorge with the thalweg at 500 m ASL. The river finally turns west after crossing Manipur territory and flows due west widening its valley and producing in the process, the fertile Cachar plain, before descending finally into Bangladesh.

The general level of the terrain is higher in the eastern part as compared to the western fringe of Manipur especially in the northern part. The eastern part of North Manipur mountainous region is drained by Iril river flowing in an asymmetrical valley, with a gentler slope and greater number of tributaries joining it from the west. East of Iril, the hills rise to reach a height of 2,800 m on Myanmar border. The relief is undulating, with towns like Chingai lying at 1,554 m and Ukhrul, the headquarters of the district of the same name, at a height of 1,960 m ASL.

4.4.2.2 The Western Manipur Hills

The Western Manipur Hills with their NE–SW alignment are a continuation of Naga Hills in the north and North Cachar Hill on the west and traverse the entire length of Manipur from north to south. Rising from west to east in a series of scarps, the west Manipur hilly region is drained by a number of parallel and sub-parallel rivers. The westernmost river of the region, that also forms the boundary of Manipur, is the Jiri river which, after flowing in a narrow entrenched valley over steep gradient, descends to 200 m ASL before it joins Barak river, the principal river of west Manipur. Parallel to Jiri on the east but, flowing on a higher level, is Makou, a tributary of Barak, and further east is Barak proper, one of the principal rivers of North-East India. Barak originates from the highlands on the Nagaland–Manipur border, east of highway No. 39, and follows a tortuous course under different names. In its source, it is known as Barak or Sangu Lok; further down flowing in a gorge and making the boundary between Nagaland and Manipur, it is known as Tuilong. Further south in Manipur it is also called locally Ahu river, a name common in Tamenglong district. It is also known as Tuiruong in western Manipur. East of Barak is Irang or Tuilang that originates from the highland 40 km west of Imphal. None of these rivers has a straight course, and almost all of them are marked by an elbow capture that suggests that these rivers have resulted from the capture of several rivers. A trellis drainage, controlled by structure, is the characteristic feature of these rivers.

A series of asymmetrical valleys and divides suggests a cuesta landscape formed in the succession of rocks, ranging from Disang series of Eocene period to Barail of Oligocene and Surma of Neogene period.

4.4.2.3 The Eastern Hills

The Eastern hills, running along the Indo-Myanmar border, have a complex geological character. This is the contact zone of the two plates where, besides Proterozoic rocks in patches, the Cretaceous sediments of deep sea have been thrown into folds with the presence of ophiolite ejected on the surface in the form of magma. This highly disturbed zone, not wider than 30 km, with a melange of formations, all subjected to a paroxysmic movement, attains a height of around 1,500 m ASL greater height, in the northern part, declining southward to 150–200 m ASL.

This fringe divide is frequently breached by easterly rivers, the tributaries of Chindwin. South of 25° N and 94° E, on the eastern fringe, the number of tributaries of Chindwin flowing southeast-ward multiplies. The drainage of one-third of south-eastern Manipur is diverted to Chindwin, and mountains on the Indo-Myanmar border disappear, giving rise to a dissected terrain with border posts showing a height of not more than 200 m ASL. In southeast Manipur, the Indo-Myanmar international boundary is 15–20 km east of the Barak–Chindwin divide. The crest of the eastern highland is breached frequently by the tributaries of Chindwin in the east and those of Manipur river on the west, the latter joining the Chindwin after flowing for more than 150 km, of which the last 100 km fall into Myanmar territory, where the river flows parallel to Mizoram border.

4.4.2.4 The South and Southwestern Mountainous Region

The southwestern hilly part of Manipur is enclosed by river Barak and its tributary Tuivai, the latter also forming the southern boundary of Manipur. This area is formed of Barail rocks of Oligocene period, consisting largely of sandstone and shales. Characterised by a rectangular drainage where NNE–SSW-flowing rivers occasionally turn at right angles following a lineament, are joined by tributaries which are more normal than subparallel to the main stream. The main tributary streams that flow in the western part in a relatively straight course are the tributaries like Tuivai, which, in several segments, follows courses which are typical of trellised drainage. Much of the land lies above 1,000 m contour, with many thalwegs at 500 m ASL. The river sides are steep and frequently descend from 1,000 m to 500 m ASL within a space of 2 km.

Dissected highland with narrow ridges and steep-sided narrow valleys is the norm. The heights above 1,500 m are the peaks and prominences; the general level of 1,000 m ASL is badly dissected, and the valleys are deeply incised with 500-m-high valley sides. No flat plains, measuring even 20 km^2 are observed. The only exception is the Churachandpur linear tectonic depression, an extension of Manipur plain. A unique feature of the area is the confluence of Barak river coming from north and Tuivai from south, at Tipaimukh from where the combined course of Barak and Tuivai traverses a course of 80 km northward before receiving the waters of Jiri from north and turning westward. It may be mentioned that a hydroelectric project on Barak at Tipaimukh is under execution.

4.4.2.5 The Central Lowland of Manipur

Surrounded by mountains on all sides, and lying slightly south of the centre of Manipur state, is the Manipur lowland, also known as Manipur basin or Imphal basin. The plain lies at an average altitude of about 800 m ASL. This north–south-extending linear plain of Manipur, measuring about 70 km in length and about

Photo 4.6 Manipur plain, near Imphal, surrounded by hills

25 km in width, has an area of 1,843 km^2 (Photo 4.6). Unlike an alluvial flood plain, Manipur basin is a linear tectonic depression in the midst of Eocene rocks of Disang group. The rim of the basin is formed by steeply rising mountains on all sides, from where short streams flowing parallel to each other emerge and join the Imphal river, or empty themselves in the Loktak Lake, situated around 30 km southwest of Imphal.

The northern part of this basin with its centre at Imphal and drained by Manipur or Imphal river is a flat featureless plain, carrying paddy fields and densely formed rural clusters. The southern part is relatively marshy which expands or shrinks depending on the season and is getting silted. Its watershed is being reclaimed for agriculture. South of Barail range, Loktak is the largest fresh water lake in North-East India. The lake lies in Imphal river basin and has a catchment of over 5,000 km^2. It is one of the most productive fresh water ecosystems and supports valuable biodiversity and the livelihood of the people living around it. The floating mass of weeds, locally known as *Phumdis*, a heterogeneous mass of soil, vegetation and organic matter at various stages of decomposition, is unique to this lake (Singh et al. 2010).

In the centre of the plain is Imphal town (781 m ASL), surrounded by lush green landscape of paddy fields that form the granary of Manipur and is characterised by closely spaced villages often aligned to the roads and partially hidden in the midst of bamboo groves and clumps of trees. The sudden drop in height from the hills to the plain provides suitable site for the generation of hydroelecric power, exploited by Loktak hydroelectric project in the vicinity.

4.4.3 The Mizoram Hills

An array of parallel and subparallel north–south-running ridges and deep valleys, in what are geologically the youngest formations of the North-East, is what constitutes the Mizoram Hills. These are formed in Neogene rocks of Surma group locally known as Bhuban formation, followed by the younger Bokabil formation on the west and occasionally overlain by Tipan series of rocks. The area, a scene of deep Neogene sedimentation, was subjected to intense compression throwing the entire area of Mizoram in a series of narrow compressed folds and deep valleys. The rocks present a sequence of arenaceous and argillaceous facies with sandstones and shales. These Miocene and Pliocene rocks are known as different formations in different areas depending upon their facies and the stratigraphic sequence. Much of eastern Mizoram is occupied by Bhuban formation, named after the Bhuban range in western Manipur of which it is a continuation. The western part of Mizoram, with lower relief, is formed of a formation, younger than Bhuban, known as Bokabil formation named after the type area of similar formation at Bokabil village in Hailakandi district in Assam. All these Neogene formations have been subjected to the compression on the margin of the Indian and Burmese plates, resulting into parallel and subparallel ridges and valleys, which decline in height from east to west.

The highest part of the Mizoram mountainous region lies in the north-east corner of Mizoram on the southern border of Manipur where a number of ridges have peaks, some of which rise above 2,000 m ASL. Some of the principal peaks in the north-east segment of Mizoram are Nauzuarzo Tiang (2,141 m ASL), Linhilingzo Tiang (1,717 m) in the loop of Tuivai river, Vapar Tiang (1,897 m) and Vankal Tiang (1,610 m). *Tiang* in Mizo means hill or mountain. From around 1,800 m in the east, the general height of the peaks on the longitudinal ridges, the height of the ridges decreases to about 800 m in the west. This is not indicative of a smoothly sloping plateau. The terrain is marked by north–south river valleys, of which the thalweg descends to as low as 800–1,000 m in the north and 200–300 m in the south. In the northern part, nowhere one finds, as one traverses, a height of less than 1,000 m.

Ridges and valleys, aligned north–south, with few east–west links, and declining in height towards west and southwest, are the main relief features of the area. Generally, the ridges are formed by anticlinal folds, which are highly compressed in Mizoram, and the valleys occupy broader synclinal depressions. The entire terrain is criss-crossed with lineaments and a number of faults, seen more frequently in the older Bhuban formation in the eastern part of Mizoram, producing oblique courses of tributary stream changing directions of their courses. River captures, breaching the divides, occasionally a complete U-turn in the river courses, suggests a topography and a drainage pattern largely controlled by structure.

The divide between the north-flowing rivers joining the Barak and those flowing south joining Kaladan, or a few that join Karnaphuli, is difficult to demarcate. What is certain is that the northern part of Mizoram is drained by Tuiwal, Dhaleswari and Sonai, all tributaries of Barak river. The southeastern part of Mizoram is drained by the river Tyao that forms the southeastern boundary between Mizoram and Myanmar

and falls in Chindwin river. The southwestern boundary is drained by the tributaries of Kaladan that joins the sea at Akyab, in the Bay of Bengal, following its course in Myanmar territory. The mid-western part of the state has two parallel rivers both moving in opposite directions, yet, finally converging. The Tuilianpui flowing southward and its tributary Tuichang from south to north, both in the same elongated linear depression formed by a syncline and enclosed by ridges on either side, join each other in Tlabung, turn west and join a tributary of Karnaphuli that cutting through Chittagong Hills falls in the Bay of Bengal.

There are no plains in Mizoram, and the valley side narrow terraces are the only venues where an improved variety of rice can be grown. A small patch of flat land, not more than 40 km^2 in extent close to Myanmar border, and drained by the headwaters of Lui Tui river, known as Champhai plain, is the rice bowl of Mizoram. A town of the same name situated in the centre of the plain is the most famous tourist spot of the state.

The Mizoram Hills, largely coinciding with the Mizoram state, present an intensely folded terrain producing north–south narrow hills with intervening valleys. The terrain is badly fractured tectonically and dissected erosionally, producing linear drainage basins and ridges with prominent peaks rising to 1,500–1,800 m and a relief that is very restrictive to communication.

4.4.4 The Karbi-Anglong Highland

Karbi-Anglong, both a district and a complex hilly terrain, has two parts, separated from each other by a narrow alluvial plain of Kopili and its tributaries which occur in a fractured zone. The southwestern part of the district and the hill complex, both carrying the same name, Karbi-Anglong, is contiguous to Meghalaya plateau and will be discussed with Meghalaya. Here, only the North-Eastern part, North-East of Kopili river, is discussed. Between the two parts of Karbi-Anglong is a narrow depression occupied by Kopili, a tributary of Brahmaputra, and its sub-tributaries.

A topographic as well as geological outlier of Meghalaya plateau, the Karbi-Anglong gneissic complex, is a highland that is sandwiched between Barail range and Naga Hills on the southeast and Meghalaya plateau on the southwest. Geologically, this highland is as old as Meghalaya plateau and has been separated from the latter by a tectonic depression occupied and filled in by the alluvium of Kopili and its tributaries. The plateau-like relief rising in a central hill of which the highest point is Chenghehison (1,357 m) is composed of pre-Cambrian gneissic rocks with Proterozoic quartzite of Shillong group that is evidence enough for its being an outlier of Meghalaya. Like Meghalaya, Karbi-Anglong has granitic intrusions. Thus this gneissic complex carries outcrops of quartzites of Shillong group and the patches of plutons resulting from granitic intrusion.

In its topographic details, it stands apart from the adjacent area, as it is bounded by alluvium-filled linear depression of Kopili and its tributaries on the south and southwest and on the north-east–southwest-oriented Dhansiri plain on the east

and southeast. Both these plains have a height of less than 100 m and in many aspects correspond to the plain of Brahmaputra of which these rivers are tributaries. On the northern side, the highland complex is juxtaposed to Brahmaputra alluvium; only in the south, it dips under the Tertiaries and the extension of Barail range.

This complex hilly land, about 5,000 km^2 in extent, is riddled with NE–SW-trending lineaments which guide the upper courses of the tributaries of Kopili and Dhansiri. In general the hilly land is higher in the east and southeast where it overlooks the Dhansiri plain and has a number of peaks rising above 1,000 m ASL, aligned in an NE–SW direction. This ridge also forms the divide between short streams flowing east to Dhansiri and the west-flowing tributaries of Kopili. The main tributary of Kopili, the Jamuna, however, girdles the Karbi-Anglong Hills from the south and also marks its southern limit.

The plateau does not have extensive flat land, but it has stepped surfaces on its margins at an average altitude of 600 m ASL. The quartzitic belt in the north-western part has linear hills though at a lower altitude. The most striking feature of the region is a cluster of falls, seen all around Karbi-Anglong, formed in river courses cutting deeper into the plateau, and these are equally numerous in the tributaries of Kopili and Dhansiri. The highest fall is 100 m close to Mikongbhek Parbat. These falls are related to lineaments causing ruptures in the rocks. The tectonic uplift of this hill complex, associated with Meghalaya, is another cause of waterfalls around the hills. This hilly terrain is highly weathered and provides suitable site for dense forests.

This relatively isolated block of Archaean and Proterozoic rocks, with heights ranging from 250 m on the margins to 1,100 m at the centre, is subjected to excessive weathering. It slopes steeply towards east but becomes more undulating and gentle in the west with a flat surface at 500 m. The rivers, though often straight, descend from the hills making a series of falls. The area is forest covered, and some of the best forests of Assam are found here.

4.4.5 The Barail Range

The mountain divide between Brahmaputra and Barak basins and between Jaintia Hills of Meghalaya on the west and the Naga Hills and Manipur in the east is known as Barail range. The name is also used for a group of rocks of Eocene–Oligocene origin with arenaceous facies. Stratigraphically the Barail rocks overlie the Jaintia and Disang group of Palaeocene and Eocene period.

Barail range as a mountain extends from Jaintia Hills in Meghalaya in the south-west to Kohima in Nagaland, a distance of about 200 km, with a width of about 40 km. The Barail as a geological formation has a far greater extent than the Barail range that is confined to the Brahmaputra–Barak major divide, which takes in its sweep the southern part of North Cachar Hills and the north-western hills of Manipur, as well as the hills of Nagaland, southwest of Kohima. Starting from Kahkaha peak (1,736 m) at the southwestern extremity of Barail range, about

8–10 km south of Haflong, the range continues north-east-ward having a series of peaks, like Mahadeo (1,739 m) and Thumyung (1,868 m). Having an average height of 1,700–1,800 m ASL, it extends further into Nagaland with Anglo peak (2,062 m) in Peren district and Dulum peak (2,066 m), finally terminating itself at Japvo (3,015 m), about 10 km southwest of Kohima. Japvo is the highest peak of Barail, though Barail as a folded system plunges mildly to North-East.

This range, a major divide between the two rivers of the North-East, is the source of many rivers and tributaries on either side. The river Barak and its northern tributaries like Makru, Jiri, Jenum and Jatinga all emerge from the southern slopes of the Barails. The main rivers emerging from the northern slopes of Barail are Dhansiri, forming the border between Karbi-Anglong district of Assam and Nagaland, and its many tributaries, and Diyung, a tributary of Kopili. Diyung takes its water from the hills near Haflong and flows 60–70 km north before joining Kopili, which emerges from the Karbi-Anglong Hills. The Barails, extending from Haflong to Peren in southwest Nagaland, are not crossed by communication lines, and the only two lines of transport are the Dimapur–Kohima–Imphal road in the east and Lumding–Maibong–Haflong–Silchar road on the west. The former joins the Brahmaputra valley with Manipur, and the latter road joins the Assam plain with the Cachar plain and further with Mizoram. The south-flowing streams from the Barails remain confined to the hilly terrain and narrow valleys for a long distance bound by a number of subparallel thrusts, preventing the rivers from widening their valleys. Thus, the upper courses of Barak, Makru, Jiri and Jenum remain entrenched in the hills for over 100 km, except for making small plains at their confluences.

4.4.6 North Cachar Hills

A very small region, between the Kopili valley and the Mikir Hills in the north and Barak valley in the south, the Meghalaya plateau on the west and Nagaland and Manipur on the east, North Cachar, a rectangular block of land, largely drained northward by Diyung, a tributary of Kopili, has a complex geological make-up. Only a very small part of the North Cachar Hills, not exceeding 10–15 %, is drained to the south by the two rivers, viz. Jenum on the east and Jatinga on the west. The southwestern extension of the Barail range stands as a divide between the north-flowing and south-flowing streams. Much of North Cachar Hills is composed of Barail group sandstones of Oligocene period, but on the north-west and southwest of the region, there are older formations of Shella and Kopili formations of Eocene period, composed of sandstone interbedded with shales. There are still younger formations, younger than Barail, on the flanks of Barail range belonging to Surma group, and occupying much of Mizoram and Tripura. From Haflong north-east-ward is the Haflong–Disang thrust, creating escarpment and steep ridges.

The southern part of the North Cachar Hills, marked by an east–west-extending Barail range, has a cluster of peaks associated with the range and is indented from both sides, north and south. Thumyung (1,866 m ASL), about 22 km east of Haflong,

is the highest peak, followed by Mahadeo Hill (1,739 m), Kahkaha (1,736 m) and several others which range from 1,000 to 1,500 m ASL. Haflong, at an altitude of 682 m ASL, marks a narrow pass where the re-entrants of north- and south-flowing streams cut through the range.

The northern part of North Cachar Hills is much lower where the river Diyung makes a serpentine plain below 300 m ASL. Physiographically, the northern part does not conform to the hilly conditions of Cachar Hills. With heavy rainfall particularly in the southern part (Haflong, 2,285 mm), the southern hilly area is forest covered. Jatinga valley south of the divide being on the windward side receives 4,767 mm of rains, while Maibong about 20 km north of Haflong, lying in the rain shadow, receives only 1,454 mm of rains. Sparsely populated, badly dissected and forest covered, North Cachar Hills hold some promise for the development of hydel power.

4.5 The Cachar Plain

The Meghalaya plateau and its topographic outlier, the Karbi-Anglong gneiss complex, separate the two great plains in the North-Eastern region of India, the Brahmaputra plain in the north and the Barak plain on the south. The Cachar plain formed largely by Quaternary sedimentation is the headward extension of the Bangladesh plain along the river Barak which in its lower course joins the Meghna river of Bangladesh, before the latter joins the Bay of Bengal. Barak has a fairly long course, but remains confined in a north–south valley in the north-western hilly region of Manipur and descends on the Cachar plain about 15 km south of Jiribam on Manipur border. Though the Cachar plain has its spread only in Cachar, Hailakandi and Karimganj districts of Assam, there is little doubt that as a physiographic unit, it extends westward into Bangladesh, which is drained by Barak, Surma and Meghna rivers. The western part of Tripura has similar relief features. All these plains are formed on a Tertiary terrain covered with thick alluvium, with gentle, often imperceptible slope causing floods during heavy monsoons.

Formed by the Barak, which flows in a general east–west direction and its tributaries, joining largely from south, Cachar is a flat, monotonous, featureless plain bordered by north–south-trending linear ridges of Manipur in the eastern part, some linear projection of low hills from Tripura in the southeast and the western extension of Barail range that forms the northern limit. Though the total length of Barak is 396 km, it flows for 192 km in the Cachar plain before entering Bangladesh territory. In its transverse profile, the river has a well-defined channel confined within its banks which are 10–15 m high above the bed of the stream. During the monsoons, the river spills over the banks causing floods. The bankful discharge in the river, at Silchar, is around 150,000 cusecs, but in summers, it shrinks in its channel. To prevent any damage caused by floods in Barak and its tributaries, embankments have been built in many places parallel to the river. Much of the Cachar plain lies below 100 m ASL. Silchar, located at the centre of the plain and on the bank of the Barak, has a height of 97 m ASL, comparable to Sibsagar (97 m ASL) in upper

Assam and Guwahati (54 m ASL) in lower Assam, both on Brahmaputra. With all the sediment load that the river carries from its upper course and an imperceptible slope in the centre of the plain, the river Barak turns out to be a highly meandering stream making wide loops increasing not only its sinuosity but also widening the meander belt that is sometimes as wide as 15 km. Excessive meandering, while dumping alluvial silt in its flood plain, has created a number of marshes, marshy grasslands and even wastelands. The fertile alluvial land is in the centre, often aligned along the Barak and its southern tributary Sonai.

The Cachar plain is hemmed in on the north by Barail range and on the south by the northward projection of Mizo Hills, specifically the low altitude Bhuban range (200–300 m ASL) and Rangli Pahar that forms the divide between the north-flowing Sonai river on the east and Dhaleswari river on the west. These parallel and subparallel ridges, transverse to Barak, are the partly eroded anticlines formed in the Neogene Tertiary sediments. The principal streams joining Barak from the north are Jiri, Chirir–Diksha nadi, Mugri river, Larsing nadi and Laranga river, while those flowing into Barak from south are Sonai river, Jalinga river passing through a large *bil* and Kathakal and Dhaleswari river. The Barak, the principal river, bifurcates itself twice into two distributaries, Surma and Kusiyara, before entering Bangladesh.

An important feature of Cachar plain is the appearance of *bils,* marshes and lakes, south of the river, some of them as far as 30–35 km south of Barak. The *bils*, lakes and marshes are, in most cases, oriented to the general lie of the land and parallel to the river, suggesting a deserted course or choking of a tributary because of excessive sediment load. The northern 10-km-wide east–west zone is forest covered, and so are the large longitudinal divides, between the north-flowing rivers from south, often coinciding with the ridges mentioned above. Transversely, these low ridges are as wide as their intervening valley plains, each not exceeding 15 km. From west to east, there is an alternating sequence of forests on the ridge tops, scrubland on the slopes and cultivated land on the river terraces. On higher terraces and lower slopes, tea gardens are observed.

All lines of transport as well as human settlements follow the valley. Two large *bils*, one in the Barak loop called *Bara Anual Bil* and the other aligned with Jatinga river, south of Silchar, are important fishing grounds. There are few patches of wasteland north of Barak, associated with the lateral spurs of Barail range. Generally believed to be plain, Cachar has its share of hills and ridges on its northern and southern parts, and the actual plain that boasts of high productivity is reduced to less than 50 % of the total land.

4.6 Meghalaya Plateau

The most ancient mass of land, a part of Deccan shield, comparable to Archaeans with its gneissic complex, Proterozoic rocks of Shillong group and the plutonic granitic intrusions, the Meghalaya plateau overlooks Bangladesh on the south and the Brahmaputra plain on the north. Varying in altitude from 150 m in its western

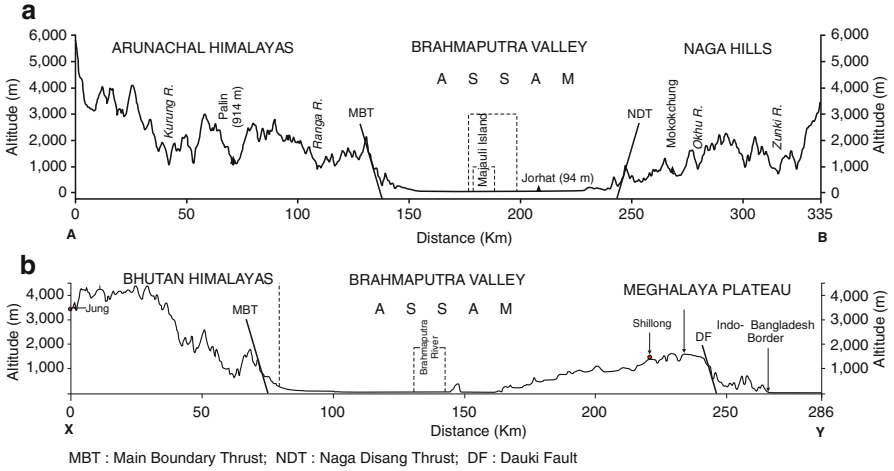


Fig. 4.4 Regional cross profiles across Brahmaputra: (**a**) from Arunachal Himalayas to Nagaland–Myanmar border; (**b**) from Bhutan across Brahmaputra and Meghalaya Plateau up to Bangladesh border

part to 1,961 m at Shillong peak in the mid-eastern region, the plateau is bounded by faults, dislocations or factures on almost all sides, giving it the appearance of a horst. With an area of more than 20,000 km^2, Meghalaya stands apart from the rest of the North-East, in its lithology, structure and tectonic and denudational history. Extending for about 300 km east–west and around 100 km north–south, as the crow flies, the plateau is higher in the eastern part where it retains one of the most ancient surfaces of planation, to be successively followed by a series of stepped surfaces westward (Fig. 4.4).

The highest point of the plateau is the Shillong peak (1,961 m) in Shillong metamorphic rocks, largely quartzite of Proterozoic period. The Shillong plateau, with a peak at the centre and slight undulations, extends from east of Shillong to its west for about 140 km without losing much height and remains at an altitude of over 1,500 m ASL. This is the most ancient of and the highest surface of the plateau, with deep weathering profiles, occasional protrusions of Shillong quartzites or the intrusive granitic plutons. The gneissic complex subjected to prolonged denudation, produced an extensive surface of planation leaving harder cores of quartzite and granitic rocks standing as inselbergs in the landscape. About 45 km west of Shillong, another prominent peak having a height of 1,924 m, and accordant with the Shillong rock, suggests a former planation surface at higher level. The prominences in the landscape are the residuals of planation.

As one moves westward, one encounters stepped surfaces, of which the lowest with 300–400 m ASL is very extensive in Western Meghalaya. The eastern third of Meghalaya is more disturbed with the extension of the Barail range and the associated tectonic movement and is higher as compared to the west. The tectonic movements particularly those associated with Dauki fault and the mountain ranges of the

Photo 4.7 Nohkalikai Fall near Cherrapunji resulting from the recession of Dauki scarp

south don't appear to have caused a significant tilt from south to north, and if the tilt is at all noticed, it is very recent (Photos 4.7 and 4.8). This is clear from the drainage divide, which has not shifted to south diverting the drainage to Brahmaputra in the north as it happens in scarp topography. An important feature of the northerly drainage of the plateau is the presence of wide trough-like valleys with misfit streams, suggesting glaciated valleys during the Quaternary.

In the southwestern part of the plateau, composed of Jaintia group of rocks, essentially sandstone and limestone, of Palaeocene–Eocene period, subjected to subsequent movement, have emerged in Tura range, an arcuate form, with Nokrek peak (1,412 m ASL) as the highest point. The range seen from its southern face appears like a scarp which drops from 1,400 m at the top to 800 m in a distance of about a kilometre. North of Tura range is another range called Arbela range with a lesser height of 996 m, separated from Tura range by an asymmetrical valley contained by the dip of slope of Tura range in the south. South of Tura range are the younger Simsang series of rocks, comparable in age to Barails, and named after Simsang river, formed in sandstone, in which Simsang river winding its way makes gorges and emerges south in a narrow plain before descending to Bangladesh. The typical Meghalaya plateau extends between Tura range in the west and Jowai on the east with intermediate planation surfaces, some of which are badly dissected.

The western margin of Meghalaya is occupied by a narrow plain not extending 30 km in width at any point. It skirts the plateau from southwest, west and northwest and does not rise above 150 m ASL. One encounters this plain between Tura and Mankachar on Bangladesh border.

Photo 4.8 Dauki fault, Bengal plain visible in the background

4.6.1 The Northern and Southern Slopes of Meghalaya Plateau

The plateau is bound by Brahmaputra plain in the north and Sylhet plain of Bangladesh in the south. While the northern face of the plateau is marked by an interrupted step-like slope, the southern face is characterised by several fault scarps, the most important of which is the Dauki fault, most noticed in the eastern sector of the southern margin.

From Shillong to Brahmaputra plain, a distance of about 75 km, presenting a steeply sloping margin of the plateau, is marked by three concave stepped surfaces. The top 25 km descending from Shillong has an overall convexity. The forest-covered slope, dissected by streams and rapids, is interrupted by these flats, namely, Umsning, Nongpoh and Burnihat from north to south. These flats, a few hundred metres wide and not more than a couple of kilometres in length, could be structural benches modified by erosional processes. In all probability these flat surfaces may have been caused by the scooping effect of glaciers during the Quaternary. The convexity between Umsning and Shillong, however, represents a recent uplift of the central mass of the plateau, marked by a fault. That also explains why the river Umiang, about 20 km north of Shillong, follows a west–east course cutting across the regional south–north slope.

Photo 4.9 Meghalaya plateau

4.6.2 The Southern Border of Meghalaya

The south and southeastern part of the plateau, besides being hilly, is badly dissected, where the south-flowing streams have cut deep gorges making frequent waterfalls on the nick points in their longitudinal profiles. The limestone terrain, formed in Tertiary limestone, has developed a topography in which the streams sometimes assume a subterranean course creating blind valleys. The limestone terrain subjected to solution weathering has given rise to a number of caves and a karstic topography.

Here is a terrain about 1,500 m ASL with a youthful relief, produced by rejuvenation of the old planation surface, during the post-Eocene period, as is evident from the occurrence of Jaintia formation at the plateau. Deep valleys, without much widening, have created gorges where the relative relief ranges from 30 to 40 m (Photos 4.9 and 4.10). This kind of landscape can be observed north of Pynursla in East Khasi Hills where rivers like Umsohra, Umfew, Wah Riv and Umsong have attributes of a highly dissected landscape. Deeply incised narrow valleys with waterfalls in their tributaries speak for a rejuvenated landscape.

The Dauki fault scarp has provided an abundance of relief energy for the south-flowing rivers to cause vigorous headward erosion (Photo 4.11). In the process, it is helped by a high rainfall of over 10,000 mm. The process of rejuvenation of landscape is characterised by valley deepening and rapid headward extension of streams; the knicks are marked by waterfalls. The principal rivers from west to east on the southern border of Meghalaya are Bugi, Dareng, Simsang, Jadukata, Shella and Umsohra.

Photo 4.10 Rejuvenated valleys south of the main water divide of Meghalaya plateau flowing southward towards Bangladesh

Photo 4.11 Deeply incised V-shaped valley flowing towards southern margin of Meghalaya plateau

Meghalaya has hardly any plain, but the south and southwest margin of Garo Hills district as well as the western margin of the plateau has a land of low relief. This border plain is attributed to Brahmaputra. Twenty to twenty-five kilometres in width, the area is drained by a number of west-flowing streams joining the

Brahmaputra. A narrow part of this plain is part of Brahmaputra plain with fertile land, occasionally ill drained as the land north of Mankachar.

An important aspect of Meghalaya's physical landscape is the occurrence of a number of falls, all along its margin, or in the rivers where they pass through a very resistant bedrock in their course, or while negotiating a very steep slope. In most of the south-flowing rivers, the fall line is marked by nick points in their longitudinal profiles. Besides, there are a number of falls in the neighbourhood of Shillong, like Elephant Falls, Bishop Falls, Beadon Falls. Most of the falls are, however, close to the southern border of the state, not more than 15–20 km from the scarp separating Meghalaya from Bangladesh. Many of these falls are in the vicinity of Cherrapunji. The Nohkalikai Falls on Shella river, about 4 km from Cherra, Nohsngithiang Falls, also known as Mawsmai Falls on Umsoh river close to Bangladesh border, the Kynrem Falls (300 m high) about 10 km south of Mawsmai, the highest fall, and the Dainthlen Falls near Cherrapunji are the well-known falls of the area.

Besides these falls, caused by uplift, faulting and creation of scarp, there are a number of caves in Meghalaya particularly in Jaintia Hills district and in the southern part of the state. The largest cluster of caves is in Jaintia Hills. The largest cave in Meghalaya is Krem Kotsati in Jaintia Hills, with a length of 21.6 km. Another cave in Jaintia Hills, that is 14.2 km long, is Symrang Pamiang cave. There are also a few caves in Garo Hills as well as South Khasi Hills area. In the former, the most famous is the Tetengkol–Umlawn (the cave of the dwarfs), more than 5 km long at a distance of about 15 km from Siju. Another cave known as Siju cave or Siju–Dobhakhol, also known as the cave of the bats, occurs on the vertical side of Simsang river below the village of Siju. It is the most researched cave and is close to Baghmara.

4.7 Tripura: The Scene of Juxtaposition of Hilly Terrain and Deltaic Plain

A frontier state bordering Bangladesh, Tripura is, in part, the extension of the folded Tertiary terrain in the hilly east and southeast and, in part, a plain, an extension of the Bangladesh plain. The folded Palaeogene sequence of sedimentation locally known as Bhuban and Dupatila formations appears as a series of north–south ridges, marking the partly eroded anticlines and semi-parallel valleys between them occupying the synclines. The ridges which are locally known as *Muras* in Tripura and *Tilang* or *Tlang* in Mizoram decrease in height from east to west. The most notable ridges from east to west are Jampai Tiang, Sakhan Tlang, Langtarai Mura, Athara Mura and Deota Mura. The highest of these in the east, close to Mizoram, border is Sakhantura with a height of 783 m ASL. The height of the ranges decreases as on moves westward. The longest of these ranges and the most widely recognised is Athara Mura with a maximum height of 435 m ASL. Further west, these ranges are breached by west-flowing streams like Haora and Gumti and their tributaries, appearing in a discontinuous series of elongated north–south hills, like Bar Mura

and Deota Mura. In some cases, where these hills appear isolated, they are known as *Tila* and the terrain as *Tila* land. Between these ridges, the synclinal depressions are occupied by rivers, starting from Deo river in the easternmost part to several others like Manu and Sardu, all flowing northward to join Kusiara river which finally joins Meghna in Bangladesh. The southwestern part of Tripura is altogether different with a predominance of plains with heights ranging from 50 m in the plains to 150 m in the *Tila* land. The drainage in the southwest is directed either westward or southward. The westward-flowing streams include Haora, flowing by Agartala, and Gumti further south, while the southward-flowing streams include Feni and Muhuri, which drain directly into the sea.

Thus, though a small part of the entire North-East region, Tripura displays an uneven relief and can be divided into two physical units: the north-eastern half that is hilly, forest covered and thinly populated, with a set of parallel and subparallel ranges, and the southwestern plains, a relatively flat region with *bils* – lakes and swamps – but intensively cultivated. The plain is an extension of the deltaic region of Bangladesh, with Agartala, the capital of Tripura, situated in this part. Located at a height of 16 m ASL and experiencing sultry summers and cool winters, the city receives 2,100 mm of rainfall annually. The rainfall increases further north with Kailashahar, about 100 km North-East of Agartala, which receives more than 2,500 mm of rains. Physiographically, one may describe Agartala as a wet monsoon region.

References

Geological Survey of India (1989) Recent advances in the study of Tertiary stratigraphy of Northeast India: a critical resume. GSI Spl Publ 3:1–23

Janardhan K, Gohain BN (1991) Quaternary geology and geomorphology of Brahmaputra valley in parts of Marigaon and Nagaon districts, Assam. GSI Rec 124(pt. IV):41–44

Lambert ETD (1937) From the Brahmaputra to the Chindwin. Geogr J 89:18 p, London

Mather LP, Evans P (1964) Oil in India. I.G.C. 22nd Session, India

Sathpathy KK (1996) Rainfall trend and its erosion potential at Barapani. Research bulletin no. 41. ICAR Research Complex for North-East Hill Region, Barapani

Singh ND, Singh SB, Singh AM (2010) The vulnerable Loktak. Hill Geogr 16:93–109

Surendranath M, Sharma GS (1991) Quaternary geology and geomorphology of Brahmaputra valley in parts of Nagaon and Golaghat Districts, Assam. GSI Rec 124(pt. 4):45–48

Taher M (1989) Physiographic framework of North-East India. North-Eastern Geogr 18(1&2):1–19

Chapter 5
The Drainage System of North-East India

Abstract The entire North-East of India is drained into the Bay of Bengal, largely through the two principal rivers of the region, Brahmaputra and Barak, flowing through Bangladesh. The drainage of a small area of Manipur, in its eastern part, finds its way into Chindwin, a tributary of Irrawaddy, which flowing by Yangon (Rangoon) traverses its delta and falls into the Gulf of Martaban, a part of Andaman Sea. Another area not included in the catchment of either of these two principal rivers is the southern part of Mizoram, drained principally by Kaladan, which falls directly into the Bay of Bengal, on the west coast of Myanmar at Sittwe (Akyab). Though the catchment of Brahmaputra extends into Tibet and Bhutan, besides India, much of the rain falling in the North-Eastern states finds its way in the territorial waters of either Bangladesh or Myanmar, before being discharged into the Bay of Bengal.

The Brahmaputra with over two dozen tributaries, joining from north as well as from south, has a total drainage area of 651,334 km^2 of which 178,000 km^2, i.e. about 27 %, lies in North-East India. About 70 % of the area of North-Eastern states lies in the catchment of Brahmaputra. A mighty river, flowing for over 1,000 km in India, Brahmaputra has a mean annual discharge of 38,000 cusecs and carries an annual suspended load of 800 million tons.

North-East India is the rainiest region of India. All the seven states of the North-East (Assam, Arunachal Pradesh, Meghalaya, Nagaland, Manipur, Mizoram and Tripura) together receive $696{,}876 \times 10^6$ m^3 of rain (696.876 km^3) which amounts to 17.42 % of the total rainfall received in India. With only 7.72 % of the area of the country and more than 17 % of rainfall, North-East has more than its fair share of water resource that the country can garner.

This enormous amount of rainfall, largely received during the 4 months of monsoon, is drained off by two major river systems, the Brahmaputra and the Barak, which, together, dispose of around 84 % of the total rainfall of the area. A small fraction is drained off by the river Chindwin flowing beyond the eastern borders of

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Table 5.1 Distribution of the volume of rainfall received in different catchments[a] of the North-Eastern states

River system	Catchment – areas in the N.E. states, in km^2	Mean rainfall in mm	Volume of rain in (10)^6 m^3	Rainfall volume in km^3
1. Brahmaputra	178,213	2,678	485,290	485.290
2. Barak	28,567.75	3,000	101,871	101.871
3. Chindwin	16,086.37[a]	1,500	24,876	24.876
4. Kaladan	10,541	3,500	36,833	36.893
5. Tripura(direct into sea)	1,573	2,000	3,146	3.146
6. South Meghalaya (through Meghna and Surma)	11,215	4,000	44,860	44.860
Total rainfall	255,083		696,876	696.876

Source: Calculated with the help of District Normals of Rainfall, IMD
[a]Catchment in India

Table 5.2 Distribution of catchments of major river systems in different states

States	Area of state (km^2)	Brahmaputra	Barak	Chindwin	Directly into sea	Surma-Meghna system
Arunachal	83,743	83,743	–	–	–	–
Assam	78,438	71,534	6,904	–	–	–
Nagaland	16,579	11,273.72	828.95	4,476.33	–	–
Mizoram	21,081	–	10,118.8	–	10,962.2	–
Tripura	10,486	–	–	–	2,097.20	8,388.8
Meghalaya	22,429	11,664	–	–	–	10,765
Manipur	22,327	–	10,716.96	11,610.04	–	–
Total	255,083	178,214.72	28,568.71	16,086.37	13,059.4	19,153.8

Source: Calculated from maps on a scale of 1:250,000. To that extent, it could be approximate, though close to accurate

the country, in Myanmar, through its tributaries that collect water from the eastern border regions of Nagaland and Manipur, while others, specifically the south-flowing streams of Meghalaya, descend on to the Bangladesh plain. Some rivers of Tripura and Mizoram directly join the sea, flowing through Myanmar or Bangladesh (Table 5.1).

Much of the rainfall (about 70 %) of the region is collected by Brahmaputra directly, or through its tributaries, flowing through Arunachal Pradesh, Assam – north of the Barail range – and down the Bhutan hills and others descending from western Nagaland and the northern part of Meghalaya (Table 5.2). Flowing through western Assam and touching Dhubri, the river joins the sea after collecting waters of Ganga and other rivers in Bangladesh. The Barak system, on the other hand, receives over 11 % of the total rainfall of the North-East and drains the region south of the Barail range, collecting waters from west Manipur, north Mizoram and Cachar. Flowing through Bangladesh and taking another name, Surma, it finally joins Meghna that finds its way into Bay of Bengal (Fig. 5.1).

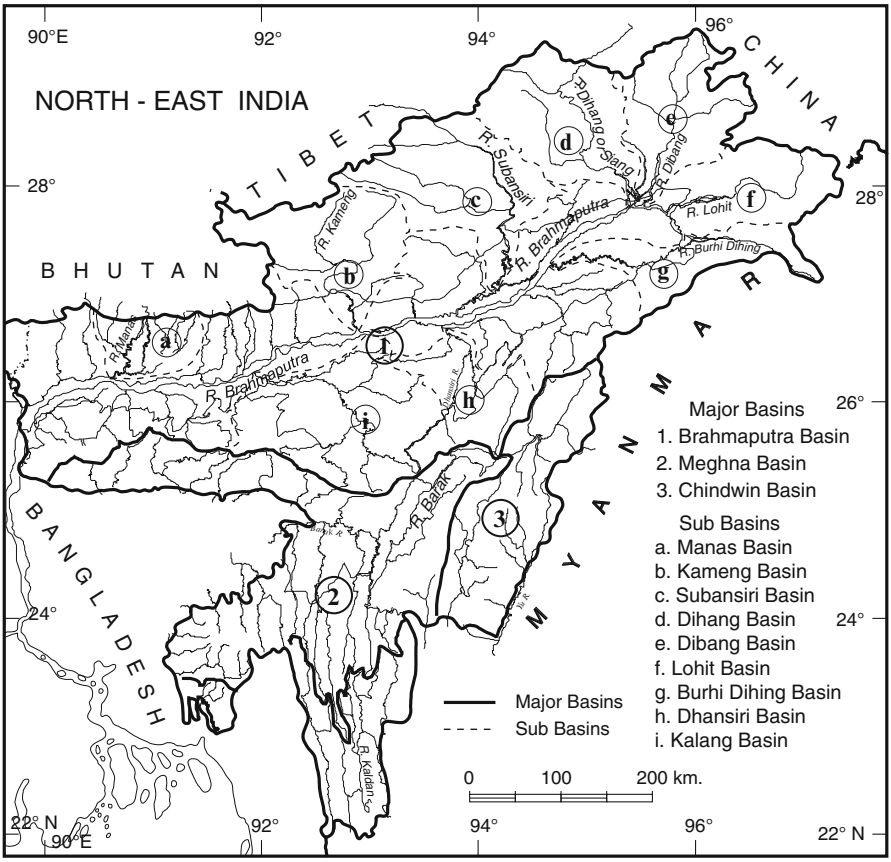

Fig. 5.1 Drainage system of North-East India: major rivers, their basins and tributaries

5.1 Drainage Network of the Region

The entire North-East region is drained into the Bay of Bengal, largely through the two principal rivers of the region, Brahmaputra and Barak, flowing through Bangladesh. The drainage of a small area of Manipur, in its eastern part, finds its way into Chindwin, a tributary of Irrawaddy, which flowing by Yangon (Rangoon) traverses its delta and falls into the Gulf of Martaban, a part of Andaman Sea. Another area, not included in the catchment of either of these two principal rivers, is the southern part of Mizoram, drained principally by Kaladan which falls directly into the Bay of Bengal on the west coast of Myanmar, at Sittwe (Akyab). Though the catchment of Brahmaputra extends into Tibet, Bhutan and Sikkim, besides India, much of the rainwater, falling in the North-Eastern Indian states, finds its way in the territorial waters of either Bangladesh or Myanmar before being discharged into the Bay of Bengal.

The Brahmaputra drains the entire Arunachal Pradesh, through its tributaries emerging from the Himalayas or from the eastern hills. In its journey of over 1,000 km in the Indian territory, it collects a large number of tributaries, both from north and

south, and develops a large catchment that extends into four states, Arunachal Pradesh, Assam, Meghalaya and Nagaland. A major part of the other two states, viz. Manipur and Mizoram, and roughly half the area of Tripura are drained into Barak.

Both the major rivers have a large number of tributaries. Brahmaputra has over two dozen tributaries joining the river from the north as well as the south. Of these, the most important ones, that add enormous discharge and sediment load to the river, are the Arunachal Pradesh rivers. These, emerging from the Himalayas, traverse through 150–200 km of hilly terrain over steep gradient, experiencing heavy rainfall, and covered with enormous weathered mantle. The huge discharge of Brahmaputra during the rainy season and the resultant floods are caused essentially by the tributaries arriving from the north and east. Some of these rivers, like Subansiri, develop even a delta at their confluence with the main river. The excessive sediment transported by them is also responsible for the creation of several small and large islands, including the well-known Majuli river island. Among the north bank tributaries, one may count, from east to west, Lohit, Dibang (the north–south transverse course of Brahmaputra itself in Arunachal Pradesh, locally known as Siang or Dihang, and flowing for over 170 km, before it turns westward, at 90°, to resume its course in Assam as Brahmaputra) and further west Subansiri and its tributaries and finally Kameng, as the principal tributaries of Brahmaputra. Further west, in Lower Assam a number of streams debouching from Bhutan Himalayas run a short north–south course before joining Brahmaputra. These include from east to west, Barnadi, Pagladiya, Manas, the river after which Manas sanctuary is named, Champamati, Saralbhanga and finally Gangadhar, the westernmost tributary of Brahmaputra. Of the tributaries joining Brahmaputra from the south, Noa Dihing and Burhi Dihing, the two branches of a single river, flowing subparallel to Brahmaputra, Disang, Dikhu, Dhansiri and Kopili are the main ones.

With the exception of Kopili, which occupies a fracture zone, most other tributaries of Brahmaputra follow a general constructional slope. Parts of some of these tributaries are guided by some lineaments, like Disang keeping its course to the Naga–Disang thrust. Some of the northern sub-tributaries of Brahmaputra follow a west–east course contrary to the general north–south alignment. This has been noticed even by early explorers. Two of the principal tributaries, i.e. Subansiri and Kameng, have several sub-tributaries flowing in a west–east direction for over 100 km. Kamla, an important tributary of Subansiri, with a sub-tributary, Kurung, has a clear west–east alignment. Similarly, Tenga, an important tributary of Kameng, runs a long course of almost 80 km from Bhutan border on the west to a point, about 25 km west of Seppa town, before it joins the Kameng.

Both these cases of east–west flowing sub-tributaries are explained with reference to the thrusts between the middle and higher Himalayas, giving rise to a furrow-like structure parallel to the Himalayan range, subsequently occupied by rivers.

5.1.1 Brahmaputra and Its Drainage Characteristics

The river Brahmaputra, the principal river of the North-East and one of the mightiest rivers in the world, in terms of its length, catchment and discharge, emerges from the Trans-Himalayan region. Though Brahmaputra ranks thirteenth in length among

the rivers of the world, in terms of discharge, it is the third important river, with a mean discharge of 38,000 m^3s^{-1}, following Amazon and Congo in that order. This is 4.1 % of the total mean discharge of all the rivers of the world. The river carries annually 800 million tons of suspended load, which works out to 1,250 tons of sediment per km^2 of drainage area. With a length of 2,897 km from its source in the Himalayas to its confluence with Ganga, a drainage basin of 640,000 km^2 and 24 major tributaries, it is the largest river of the Indian subcontinent. The river is known to the Tibetans as Tsangpo, to the Chinese as Ya-lu-t'sang-pu, to the Indians as Brahmaputra and in Bangladesh it is called Jamuna. The following are roughly the main dimensional features of Brahmaputra:

Length	2,897 km
Drainage area	651,334 km^2
Mean discharge	38,000 m^3s^{-1}
World rank in mean discharge	3
Mean discharge as a ratio of the world total in percentage	4.1 %
Average annual suspended load	800 million tons
Average annual suspended load per km^2 of basin area	1,250 tons

The river emerges from the Chema-yungdung glacier (30°-31′ N and 81°-10′ E) about 100 km southeast of the lake Manasarovar. The three head streams of the river are the Kubi, the Angsi and the Chema-yungdung. In Tibet, the river runs for approximately 1,200 km and has a shallow channel unlike Indus and Sutlej, which have cut deep channels in western Tibet. It flows at an altitude of 4,534 m ASL at Drongpa Tradun and at 3,610 m at Shigatse (Zhigatse). After passing Pi (Pe) in Tibet, the river turns North-East and flows through a succession of narrow gorges between the massif of Gyala Peri (7,150 m) and Namcha Barwa peak (7,756 m ASL). Skirting past Namcha Barwa (Namcha Barwa is located in the loop of Brahmaputra), the river flows in a deep gorge, believably 5,000 m deep, turns south-west, and cutting across the Himalayas, enters Arunachal Pradesh near Korbo (3,262 m in close proximity) as Dihang river. The Dihang runs for 240 km in an incised valley before it enters the plain at Pasighat where it takes a westward turn, assuming the commonly recognised name Brahmaputra. Down Pasighat, the river flows E–W in Assam for over 700 km before it turns south at Dhubri and enters Bangladesh. Known as Jamuna in Bangladesh, it collects the waters of Padma, a distributary of Ganga and other rivers, before debouching into the Bay of Bengal.

The estimated length of the different segments of Brahmaputra varies, but a best estimate, according to the present author, is as follows:

Segment of Brahmaputra	Length (km)
l. Tibet	1,400
2. Arunachal Pradesh	260
3. Assam	770
4. Bangladesh	450
	2,880

The Brahmaputra flows in a west–east trough, collecting tributaries, both from the north and the south. In Tibet, it flows at an altitude of 4,500 m ASL, in a shallow trough, in the rain shadow of the Himalayas. The height of the thalweg at Drongpa Tradun, at 30°0′ N and 83°59′ E, is 4,524 m ASL, while at Shigatse 29°10′ N and 89°0′ E, it is 3,609 m. The height of the riverbed further east, before it skirts Namcha Barwa at Gyala Peri, is only 2,440 m implying a very deep gorge. The longitudinal profile of the river in Tibet does not show a significant gradient. From Drongpa Tradun, about 180 km down the source of Brahmaputra, located at a height of 4,525 m ASL to Shigatse (3,609 m ASL), about 450 km down Drongpa Tradun, there is a drop of over 900 m, but from Shigatse to Gyala Peri where the thalweg has a height of 2,440 m ASL, the drop is more than 1,150 m. This is the steep upper end of the gorge that skirts Namcha Barwa. The longitudinal profile of Brahmaputra in Tibet appears to have two segments which represent two concave profiles developed during two different erosional phases or have resulted from the structural influence in two different lithological provinces. Lhasa (29°42′ N and 91°08′ E) at a height of 3,659 m ASL, 45 km north of Brahmaputra, receives a mean rainfall of 388 mm with a maximum in July and August. In its upper half the river is overlooked by a highway (H. No. 219 of China and further down no. 318), which at Chushul turns North-East to link Lhasa and the territory beyond. At Cyemdrong (Kyemdrong), about 200 km upstream of Namcha Barwa, the river takes a turn towards North-East and, flowing for about 200 km, skirts the Namcha Barwa peak (7,756 m) trough a gorge, 5,000 m below the adjacent peak, turning again southwest-ward to cross into Indian territory through a succession of rapids and falls. The meeting of the two concave profiles, the end of the gently sloping one, starting from the source region, and the beginning of the lower one starting from Shigatse, is marked by a braided channel, suggesting a change of gradient. In fact, the appearance of braided channels in the course of Brahmaputra in Tibet is suggestive of either a change in hydrological regime because of the confluence of some tributary or a change in the structure of the terrain. Down Chemnak (94°30′ E) located on the bank of the Brahmaputra, the river starts incising its course vigorously, and flowing in a gorge, skirts Namcha Barwa before it turns southwest and enters Indian territory at 95°05′ East, the nearest settlement being Korbo at a height of 3,267 m ASL.

In Arunachal Pradesh, the river has a course of 260 km. From 776 m at Korbo, the settlement near the entry point of Brahmaputra, the river forms a steep concave profile and enters the plain at Pasighat (157 m ASL), thus descending over 600 m in a distance of 230 km. This is the most significant stretch of Siang from the point of view of energy generation. India has planned a couple of mega hydroelectric projects in this zone. Known as the Upper and Lower Siang projects, these are meant to harness almost a third of the hydroelectric power potential of the state of Arunachal Pradesh. The energy planners of India may be revising the location and evaluated energy potential of the river after the construction of Zamu dam in Tibet. From Pasighat in Arunachal Pradesh, the river flows in a plain for 35 km to the south, before it receives two prominent tributaries, the Dibang and the Lohit from the north-east and east in the neighbourhood of Sadiya (134 m ASL). Receiving the discharge from the tributaries and sub-tributaries and their headwaters, extending up

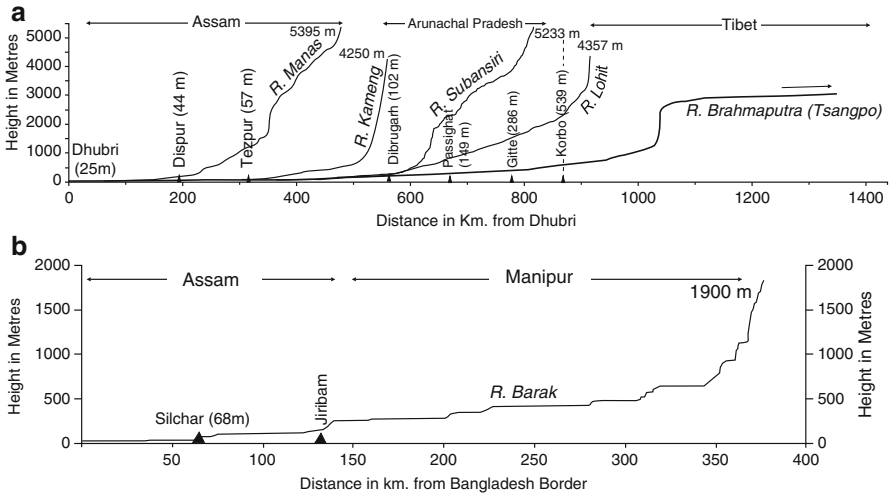

Fig. 5.2 Longitudinal profiles of the thalwegs of (**a**) Brahmaputra and its tributaries and (**b**) the river Barak

to the international border with China, Myanmar and beyond, the river assumes its mighty appearance down Sadiya. At Sadiya, an enormous discharge of water from the large catchments is funnelled into Brahmaputra. In Arunachal, Brahmaputra is known as Dihang or Siang, but down Sadiya, it attains its widely recognised name, the Brahmaputra.

From Sadiya, turning southwest-ward, the river runs for 720 km in Assam, in what is known as Assam valley or Assam proper (Fig. 5.2a, b). This stretch of the river is the most significant part and could be called the cradle of Assamese culture. The Brahmaputra is the lifeline of Assam providing abundant supply of water, important avenue for fisheries and other aquatic life, a splendid and economic means of transport and easy connectivity over flat terrain. But, notwithstanding the contribution to the economy and culture of the people of the region, it also brings miseries and causes loss of life and property whenever it swells beyond its bank and inundates large part of the plain. Thus, the river is also a curse for Assam, almost as much as it is a boon. The longitudinal profile of the river from Dibrugarh to Dhubri presents an imperceptible slope. The 720 km of the course of Brahmaputra, in Assam, is marked by braided channels; sandbars, sometimes with permanent large islands and shoals; and a width ranging from 3 km near Guwahati to 7 km at Dhubri. The sediments supplied by the tributaries in Assam, like Subansiri or Kameng, add to the already heavy load of sediments brought from the upper part of the catchment. This additional load of the river, already overcharged with sediments, creates a situation where the river dumps its excess load, giving rise to sandbars and islands. The river changes into an intertwined braided river with sandbars, shoals and islands. The island of Majuli, 70 km long and 10–15 km wide, developed on the mouth of Subansiri that has dumped enormous amount of sediment load at its

Photo 5.1 Brahmaputra, near Tezpur

mouth, blocking its own confluence and developing another channel subparallel to Brahmaputra, to join the latter about 70 km downstream at Subansirimukh. Braiding of the channel, meandering of the tributaries, emergence of islands and distributary channels, as a result of blocking of the mouth of the tributaries, is a common phenomenon in Brahmaputra. Distributary channels, flowing in downstream direction, are common in the case of most of the important tributaries, though it is most noticeable in the case of Subansiri, on the northern side, and Kalang on the southern bank of Brahmaputra. Right across Tezpur where Kameng joins Brahmaputra, Kalang, a distributary channel, bifurcates from Brahmaputra on its left bank and joins the river about 25 km downstream near Guwahati (Photo 5.1).

A cross profile of Brahmaputra is marked by a first distributary channel, followed by *Chapari*, swampy island, often covered with 2–3 m tall grasses, one of the braids, a shoal, another channel and finally another braid or the outer channel and finally the flood plain of the river. Only at a few points like Tezpur (Silghat), or Guwahati (Saraighat) or at Goalpara, the river flows in a narrow and relatively deeper channel. The braiding and the width of the channel increase in the western part of Assam, where the river gets further charged with an excessive load transported by tributaries, particularly those descending from Bhutan hills. Manas emerging from Bhutan Himalayas is one such river.

The tributary streams that join Brahmaputra after it debouches in the plain of Pasighat join from both sides north and south. In the eastern part, the Siyom, a tributary subparallel to the main river Siang, joins the latter before it emerges from the hills. The Dibang and the Lohit, converging from the north-east and east, join Siang further west, and the latter assumes the name Brahmaputra. The main tributaries from the north, all of them transverse to the Brahmaputra, emerging from the Himalayas and flowing through Arunachal territory are Subansiri and Ranga with large number of sub-tributaries, and further west Jia Bharali, Dhansiri (right bank tributary), Puthimari, Pagdaliya, Manas, Champamukhi, Saralbhanga and finally

Sankosh that forms the border between Assam and Bengal. West of Dhansiri, most of these northern tributaries of Brahmaputra originate deep inside Bhutanese territory at altitudes ranging from 5,000 to 7,000 m ASL.

The southern tributaries of Brahmaputra, recounted from east to west, include Burhi Dihing, Disang, Dikhu, Jhanzi, Kakadanga, Dhansiri, Jamuna and Kopili. Of these Burhi Dihing, Noa Dihing, Dhansiri and Kopili are more voluminous in their discharge. The first three of these rivers originate from Naga Hills, but Dhansiri, Jamuna and Kopili originate from the northern slopes of Barail range. There are also few rivers from the northern half of Meghalaya that join Brahmaputra. Some of these rivers, particularly Burhi Dihing, Dhansiri and Kopili, are highly meandering and navigable for a large part of their course.

5.1.1.1 Transverse Profile and the Flood Plain Characteristics of Brahmaputra

The convergence of a number of tributaries of Brahmaputra near Sadiya, like the apex of an inverted fan, Brahmaputra accumulates huge mass of water and an equally heavy load of sediments much beyond the transporting capacity of the river. This results in aggradation of the channel, emergence of several islands and the division of the river into multiple channels, branching off and reuniting, giving rise in the process to a braided channel, islands and bars which characterise the cross section of the river. The shift in the course of the river can be seen in the presence of cut-offs in the flood plain, marshy land and impeded drainage.

Of the 75–80 km wide Brahmaputra plain, the central part with 3–5 km wide channel and the active flood plains on either side, together, occupy about half the width of the plain. On each side, the channel is bordered by an active flood plain, followed in its transverse cross section, by the old flood plain and the Quaternary terraces. Beyond the back swamps, characteristic of the flood plain, are three surfaces, a swampy area (T-1), an old flood plain (T-2) and an old terrace (T-3), identified in Nagaon and Morigaon district by Janardhan and Gohain (1991) (see Sect. 4.1).

What appears clear is that while there is a distinct high terrace, there are no stepped surfaces, and the present and old flood plains form almost a continuum recognisable only by their surface character and proximity to the river. Occasionally, an embankment delineates the old flood plain from the present flood plain. Even the old flood plain, with a string of settlements and agriculture fields, one may even call it a lower terrace, the main avenue of Assamese culture, is not much above the flood plain.

In a few areas, as near Guwahati, the bordering surfaces are confined to only one side of the river because of the encroaching hills on the other side.

5.1.2 Barak River and Its Tributaries

Besides Brahmaputra, the other important river system in the North-East is Barak, earlier known a Surma. It is the most important east–west flowing river, south of Barail range. Barak, like Brahmaputra, has two major segments, the north–south

segment flowing largely in the western part of Manipur and the east–west segment occupying southern Assam, commonly known as Cachar plain. The river, originating in the mountainous complex on Nagaland–Manipur border, flows south in a synclinal depression until it reaches the Mizoram border; it is joined by the river Tuivaw flowing northward. The river turns westward almost at right angle, near Jirighat. Draining the Cachar plain and the three districts of Cachar (Silchar), Hailakandi and Karimganj, the river divides itself into two branches, the northern branch known as Surma that flows by Sylhet City in Bangladesh and the southern one called Kushiara that also flows southwest-ward to finally combine with other streams to be merged into the Meghna river. Surma, of which the Indian segment is known as Barak, has a total length of 890 km. But Barak, from its source in northern Manipur hills on the border of Nagaland till it enters Bangladesh, has a length of 396 km. It has a catchment of 28,567 km^2 in the North-East Indian states, collecting water from western Manipur, northern Mizoram, Cachar, Hailakandi and Karimganj districts, and a very small area of North Cachar Hills.

The river has a very peculiar course and appears to have formed by joining different stretches of various rivers through river capture. Originating from North Manipur hill complex (1,871 m) close to Nagaland border, the river runs in NE–SW direction for a distance of 150 km in a narrow often deeply incised valley till Tipaimukh (it should be Tuivâimuka) on Manipur–Mizoram border where it is joined by north-flowing Tuivai river from Mizoram. After its confluence with Tuivai, the river turns northward with a very acute bend, and runs for 35 km before it is joined by the river Jiri coming from north, at Jirimukh, and then turns westward into Cachar plain. While the course of Barak up to Tipaimukh appears natural, as it flows in a synclinal depression, the sudden turn westward appears far from natural. What appears certain is that it is the Tuivai, which following a synclinal depression with a plunge toward north, captures Barak that flows all through Manipur and continues northward till it is captured at Jiribam, by the headwaters of a west-flowing river, assuming the name Barak. The westward flow of Barak, from Jirimukh to Silchar and beyond, is sluggish as the river flows on a much gentler slope, creating the Cachar plain. The river Barak to Cachar is as important as Brahmaputra to Assam. Both the rivers have developed similar plains, east–west aligned, perfectly flat but relatively narrow. Barak is, however, much smaller.

Barak receives a number of tributaries, from the north as well as south. While Makru and Jiri, both west of Barak, are the tributaries that join the river from Manipur, Tuivai joins it from Mizoram and a number of tributaries, namely, Sonai, Rukri, Dhaleswari and Langai, join it from the south in Cachar, Hailakandi or Karimganj district (Photo 5.2). An important feature of Barak's course is its transverse flow to parallel and subparallel to late Tertiary ridges that form the undulating terrain of Mizoram, Cachar and even Tripura. It cuts across these ridges on their northern ends where they either disappear and are buried or they assume a very low profile. This explains partly the high banks of the river, which are not in Quaternary alluvium but remnants of earlier periods.

Photo 5.2 Barak river in Karimganj district in Cachar, 40 km west of Silchar

5.1.3 Hydrological Regimes and Discharge of the Rivers in North-East India

The records of stage and discharge of most of the rivers in the North-East remained virtually unrecorded till 1954. Only in Brahmaputra, stage was recorded at Dibrugarh, Tezpur, Guwahati and Dhubri. The situation is much changed after 1954. At present, there are six major gauge stations on Brahmaputra where stage, discharge and sediment measurements are carried out on a daily basis (Goswami 2007). In the tributary basins of the river, there are more than 50 gauge stations, with many of the major tributaries having two stations, one in the upper and one in the lower segment of the basin.

The mean annual discharge of Brahmaputra varies from point to point. The average annual discharge, as given by Parua (1999), is 19,200 m^3s^{-1} (678,000 cusecs). Sarma, on the other hand, quotes a mean annual discharge of Brahmaputra at Pandu for the period 1955–1990 as 16,682 m^3s^{-1}. Though the discharge of the river varies with the month, flood regime and the point where it is measured, the month of July, the month of highest rainfall, shows the highest mean discharge. In contrast, February has the lowest discharge. In contrast to the mean annual discharge, which is only averaging the variable discharges in different months, the maximum discharge recorded during June, July and August months, representing the period of summer rainfall, is exceptionally high. The average annual flood discharge of Brahmaputra is 48,160 m^3s^{-1} (Goswami 2007), whereas the highest flood discharge recorded at Pandu (in the neighbourhood of Guwahati) of the same river, in 1962, was 72,148 m^3s^{-1}. This was, no doubt, an exceptional flood with a recurrence period of

Photo 5.3 River island (charpari) in the Brahmaputra, Jorhat district, Eastern Assam

100 years (Goswami 2007). The Assam Gazetteer, a state government publication, mentions the peak discharge for Brahmaputra at Pandu varying between 50,000 and 70,000 m^3s^{-1}.

5.1.3.1 Islands in Brahmaputra River

The river is known for having a large number of islands in its course in Assam, caused either by the deposition of sediment carried by the river and its tributaries or as a result of bifurcation of its tributaries or branching off of distributaries from the trunk river, to facilitate the flow, to join it at some distance downstream, enclosing an area between the main channel of Brahmaputra and the distributary as an island (Photo 5.3).

5.1.3.2 Majuli, the Largest Island in Brahmaputra

The most important river island of Brahmaputra is Majuli island, reputed as the largest riverine island in the world. The island is formed as a result of the closure of a part of the Brahmaputra flood plain on its northern bank, by one its distributaries, Kherkutia, and a major tributary, Subansiri, both joining Brahmaputra from the north. The Kherkutia branches off from Brahmaputra at 27°06′ N and 94°30′ E and joins the Subansiri, about 40 km downstream. The latter river joins the Brahmaputra further downstream, about 40–50 km west of its confluence with Kherkutia river. Thus, a large part of Brahmaputra flood plain, known as Majuli (Majauli) island, is enclosed by these three rivers, the Brahmaputra in the south and the Kherkutia and

Photo 5.4 Bank erosion in Brahmaputra near Majuli Island, Jorhat district, Eastern Assam

Subansiri on the north (Photo 5.4). The island had an area of 485 sq miles (1,256 km^2, Imperial Gazetteer 1907) in the beginning of the last century but has undergone severe erosion, bringing down the area to 875 km^2 (NATMO 2004). While the shrinking area of the island is an established fact, the degree of shrinkage and the present area of the island are variously estimated. By superimposing the bank lines at different periods, from the maps of the last and the present century, Sarma and Phukan (2004) estimated the area of the island at various periods. According to them the area of the island shrank gradually, though not at a uniform rate, from 1917 onward as follows:

Year	Area of Majuli Island (km^2)
1917	751.31
1966–1972	564.01
1996	453.76
2001	421.65

It is quite likely that some of these estimates are based purely on cartographic exercises from the maps while the earlier records are based on actual surveys.

The southern part of the island is undergoing erosion by Brahmaputra, particularly, after the severe earthquake of 1950, which affected the course of the river and changed its cross profile at many points. Concurrently, some aggradation appears on the northern side, as a result of the accretion of sediments brought by the river Subansiri. The island carries many cut-offs, locally known as *bils*, and is drained by a small rivulet called Uni. Besides, the island is full of depressions, some natural but some have also sprung up as result of the removal of earth for building. In rainy

season, the outer area of the island gets flooded, the transport routes between the settlements get disrupted and boats ply to transport people and goods. The island is known, above all, for a couple of principal Vaishnavite monasteries, a sect of Hinduism.

Majuli, a division of Jorhat district, has a number of rural settlements; the most important of which is Kamalbar and is administered by the state. It is also the home of Mishing tribe whose huts on stilts can still be seen on the island.

There are many other islands in Brahmaputra, but the ones that can be mentioned additionally are the islands named Burachapori and Unmanand, the latter lying in the midst of Brahmaputra, just across Guwahati, sanctified by the presence of a temple of Lord Shiva.

5.1.4 Other River Systems of North-East India

Most rivers of the North-East join one or the other of these two major rivers, i.e. Brahmaputra and Barak, yet there are few rivers in eastern Nagaland, eastern Manipur, southern Mizoram and Tripura which either join some other river in Myanmar or Bangladesh or flow directly into the sea.

The largest river in Nagaland is Diyung or Tapu, which flows north from the central hill complex in a syncline, cuts across the ridge on the west, turns south and finally joins Dhansiri, a tributary of Brahmaputra, joining the latter at a point, south of Golaghat. Another tributary of Dhansiri is Diphupani or Diphu, which originates from the neighbourhood of Mt. Japvo and, moving swiftly in a hilly terrain, joins Dhansiri, about 8 km north of Dimapur. The other rivers, moving northward as tributaries or sub-tributaries of Brahmaputra, are Disang, Jhanzi and Dikhu, all joining Brahmaputra as its tributaries. Dikhu passes by Sibsagar, the erstwhile capital of the Ahom kings, during medieval period. A very small part of Nagaland, in the southeast, is drained to Chindwin river in Myanmar. The most important of the Nagaland rivers, draining into Chindwin, is Tizu which, with its tributary river Zungki, crosses the international border with Myanmar, about 20 km south Saramati (3,826 m), the highest point on Indo-Myanmar border, and joins Chindwin at Tamanthi.

In Manipur, the divide between Barak basin lying in India and the Chindwin in Myanmar is formed by a north–south longitudinal ridge, which is also the site of the main route between Nagaland and Manipur, joining Kohima with Imphal. The rivers in the eastern third of Manipur, particularly south of 25° north, find their way in the cross-border region of Myanmar and join Chindwin. The western part of Manipur is characterised by parallel and subparallel streams, sometimes capturing the neighbouring streams by a vigorous headward erosion of their tributaries, which breach a low divide and change the orientation of the streams. The western border of Manipur is demarcated by three rivers, Jiri in the northern part, Barak in the centre and Tuivai (Tuivaw) in the southern part. In Manipur, Jiri, Makru, Barak and Irang or Tuilong are the three principal rivers – all of which flow southward

and, through a series of capture, end up in Barak river, which moves westward flowing east–west through Cachar.

In Mizoram, the northern half of the region is drained by three important rivers. From west to east, these are Dhaleswari, Sonai and Tuivel, all joining Barak after flowing over 100 km to the north. All these rivers are remarkably straight, without any meandering. The border of Mizoram with Myanmar is formed by two rivers, Tio or Tyao in the north and Tuipui or Boinu in the south. Like Mizoram–Myanmar border, Mizoram–Bangladesh border is also formed by a river course or a ridge. The most important river in south Mizoram is Kaladan, which collects the waters of the southern part of the state and joins the Bay of Bengal at Sittwe in Akyab Creek, in Myanmar. In Tripura, while the river Gomti flows westward, another river Feni, flowing southward, finds its way into the sea.

The Meghalaya plateau falls into the catchment of two river systems. The northern part of the plateau is drained into Brahmaputra through its tributaries, while the drainage of the southern half finds its way into Surma–Meghna catchment in Bangladesh. The streams flowing to the south are characterised by falls as a result of retreating nick points in the longitudinal profiles of these rivers. Invariably, these rivers have to cut through the fault escarpment, associated with Dauki fault, on the edge of the plateau, to join the river Surma in Bangladesh. In the process, they make deep gorges in the plateau, close to the escarpment.

The divide line between the northerly and south-flowing rivers is a little indented. In the centre of the plateau, it moves northward. This arched divide line passing from east to west, joining the highest points on the plateau, has shifted to the north because of greater relief energy available to the south-flowing streams as a result of the fault escarpment, over which they flow to negotiate the base level, over 1,000 m lower, in Bangladesh. It is also likely that the headwaters of some of the north-flowing streams are pirated by the rivers flowing southward. The main rivers flowing southward, from west to east, are Simsang-Someswari, Krishiang-Jadukala, Shella and Umsohung, while those flowing north, counted from west to east, are Ghagua, Krishnai, Dudhani, Umkhri, Umian, etc. All these rivers while descending from the plateau make falls, which are more numerous in the course of south-flowing rivers. Some of the south-flowing streams, occasionally flowing through limestone terrain, develop blind valleys witnessed during the dry season.

Generally, flowing over steep gradients – though part of the streams may flow over flat terrain for a short stretch of 15–20 km – these rivers seldom, if ever, experience floods, but are not always easy to cross in their lower stretches, on the margin of the plateau, where they make gorges, rapids and falls, and are deeply entrenched.

A noticeable characteristic feature of some of the valleys, on the plateau, is their broad, trough-like cross profiles. Sufficiently deep, yet broad and open, they unmistakably suggest a glacial valley, a palaeoclimatic remnant of the late Quaternary. It is not inappropriate to imagine such a relief carved out either by glaciers or even by an alternative sequence of glacial and pluvial phases. Several flat surfaces on the northern face of the plateau, notably at Umsang and Nongpoh, suggest a scooping by glaciers.

5.2 Drainage Arrangement: Adjustment to Structure

5.2.1 Pre-existing Relief and River Capture

5.2.1.1 Pre-existing Relief

Rivers in the North-East have not developed on a relatively plain surface to drain off the excessive water as part of the hydrological cycle and carved their own valleys. The initial flow should have followed the Himalayan frontal sag produced by a compressive force generated by north or north-east moving plates. The Brahmaputra occupies the frontal linear depressions, formed in front of the rising Himalayas, over the subduction of the basement rock, i.e. the front of the underthrusting plate. In the case of Barak, it occupies the foredeep in front of Barail which was uplifted in response to the compression applied against the pre-Cambrian crystalline base of Karbi-Anglong plateau. The rivers of Arunachal, or those coming from Bhutan hills, i.e. the northern tributaries of Brahmaputra, transverse to the valley, have followed the steepest gradient that is available to them in a straight course to join Brahmaputra, with several stretches guided by structure. Most of these tributaries from Subansiri in the east to Sankosh in the west follow a course normal to Brahmaputra. Only in the lowest part of their course, some of them are influenced by the longitudinal slope of Brahmaputra and turn downstream before joining it, as is the case of Subansiri.

The situation is different in the case of the tributaries of Brahmaputra flowing from south. The Kopili and Dhansiri clearly follow a fault line. Kopili in fact follows a fracture zone between the two plateaus representing the ancient crustal blocks, the Meghalaya and the Karbi-Anglong. According to Das Gupta and Biswas (2000) "the collision of the continental masses seems to have commenced around early Eocene or say 40–45 million years BP, and multiple phases of mountain building and mountain front basin formation has continued since then. The present day basins are reflected by the Brahmaputra, Kopili, Dhansiri and Surma-Barak alluvial plains and much of the earlier continental crust is buried deep under these basins". It may be mentioned that under the Brahmaputra alluvium, there is a Tertiary sedimentation of several thousand metres.

The rivers of eastern hilly region are a textbook example of adjustment to structure. Leaving aside the schuppen belt of western Nagaland, all the other areas of Manipur, Mizoram and Cachar have a north–south alignment of the rivers. Whether it is Dayung and Tizu of Nagaland or the rivers of Manipur like Barak, Jiri or Makru or the river Tuivel of Mizoram, all follow either a synclinal depression or slide down the dip slope and rest at the base of a scarp in an area of asymmetrical folds. The scene is very evident in Mizoram, where the narrow compressed anticlines separate the synclinal valleys that harbour most of the streams of the region. Sometimes, these narrow anticlinal ridges are breached by faults and provide easy opportunity for the more vigorously eroding river to capture the waters of another river parallel to it.

Thus, most of the drainage lines in eastern part of the region – Nagaland, Manipur and Mizoram – are trellised.

The North-East of India is very severely subjected to tectonic forces generated by the collusion of the plates on its northern and eastern boundary, and the structural outlines developed following the compressive movements have generated depressions which are the preferred sites of the streams.

5.2.1.2 River Captures

The zones of river capture in the North-East could be categorised into three groups.

1. *Trans-Himalayan River Capture* – Some of the south Asian rivers, like Indus and Brahmaputra, are noted for their antecedence, and they are often presented as examples of antecedent drainage. An alternative explanation in the case of Brahmaputra is not only possible, but more plausible. To the present authors, it is a case of headward erosion by Siang beheading the arcuate longitudinal upper course of one of the rivers, flowing parallel to Salween. This could be even the headward extension of Lohit that takes a northward sweep, beyond the borders of India, occupying one of the several arcuate trenches formed by the surface compression of the North-East-ward-moving underthrusting plate. Accepting the antecedence of Brahmaputra is accepting the unnatural rhomboidal shape of the loop around Namcha Barwa in which the Brahmaputra flows in opposite direction in the two opposite yet almost parallel stretches of the river.
2. *Beheading of headwaters* of streams flowing northward from the Himalayan divide into Tsangpo, by the south-flowing tributaries of Brahmaputra, on India–Tibet border. Subansiri, a tributary of Brahmaputra originating on Indo-Tibet border at 28°40′ N and 93°30′ E near Migyitun (2,936 m), capturing the headwaters of the north-flowing tributary of Tsangpo, through a series of rapids, creating a wind gap in the valley, is another case of trans-Himalayan capture. This happens because of difference in gradient on the two sides of the Himalayan water divide, which leads to a disproportionately high headward extension and erosion on the southern than the northern slope. Added to this is the high rainfall on the southern slope that helps erosion.
3. *Retreat of the divide line* in Meghalaya away from the sources of more actively corroding river. The apt example from Meghalaya would be Simsang-Someswari extending their basin northward capturing the headwaters of Dudhnai and Krishnai both of which flow northward and join Brahmaputra. The relief energy and the overall gradient in the south are much higher to enhance the erosive power of south-flowing streams, which also have the advantage of copious monsoon rains.
4. *Trans-anticlinal capture*, common in Manipur and Mizoram, where the tributaries of a north–south-flowing rivers occupying the synclinal depressions capture the headwaters of another stream flowing in the adjacent synclinal valley, by breaching the low altitude divide and diverting the headwaters of the adjacent stream. The most spectacular case of trans-anticline river capture is that of the rivers of

western Manipur. Here the rivers involved are Irang or Tuilang, Makru, Jiri and Barak rivers. All these rivers flow in a NE–SW direction. They all join each other through a series of W–E elbow across the anticlines. Here the river Makru, originating in the hill complex on the Manipur–Nagaland border, captures Barak flowing parallel to it, about 30 km east of the former. The distance increases progressively to the south. The capture is through a gorge in the eastern tributary of Makru which cuts across the anticlinal hill near Govakat, through a gorge at 24°37′ N and 93°11′ E. Flowing further south Makru is named Barak. Similarly, Barak captures the headwaters of Irang or Tuilong through an elbow of capture at 24°10′ N and 93°10′ E. Regardless of which river captures which, the name of the downstream segment is always named after a larger river, here Barak.

Structural alignment of rivers is very obvious in Diyung in Nagaland and Kopili in Karbi-Anglong. The river Diyung or Tapu, the longest river of Nagaland flowing through Wokha district, with its headward extension into Mokokchung district, has the same alignment as the North-East-flowing Jhanzi. For about 80 km, the North-East-flowing Jhanzi and southwest-flowing Diyung-Chubi Zhuku are aligned in a perfect linear form appearing like a straight furrow in western Nagaland. The drainage of the North-East, specifically of Nagaland, Manipur, Mizoram and Tripura, is guided by structure. The rivers have followed the synclinal troughs created by NE–SW folds, involving thick pile of Neogene sediments, folded during the wake of the collision of plates and occasionally traversed by transverse faults, which break the divide and create sites for river capture.

5.2.2 Longitudinal Profiles of Rivers

The longitudinal as well as cross profiles of the rivers are significant in the applied field of water storage, generation of hydroelectric power and navigational use. Figure 5.2a depicts the longitudinal profiles of a number of rivers, including Brahmaputra and its tributaries. One can group these profiles into three categories. The long profile of Brahmaputra stands apart from all other long profiles of the region. It is a composite profile where two longitudinal profiles developed in two entirely different regions at different times have been linked by a river capture:

(a) Unique longitudinal profile of Brahmaputra
(b) Profile with steep upper concavity
(c) Profile with a mild convexity in the upper course
(d) Profiles with steep upper concavity and stepped lower end of the concavity

The sub-horizontal profile of Brahmaputra on the Tibetan plateau, occasionally with a braided channel, is the graded segment of the river Tsangpo, entirely unconnected with the Brahmaputra in its origin and geomorphic evolution. The Brahmaputra, on the other hand, originating on the southern slopes of the Himalayas, has a profile comparable with other rivers of Arunachal Pradesh. The capture of Tsangpo through headward erosion has joined Brahmaputra with Tsangpo, thus linking the two independent profiles.

Thus, Brahmaputra has three segments in its longitudinal profile, a flat Tibetan segment, an Arunachal segment with steep upper concavity and the lower absolutely graded segment of Assam. While the steep mid-segment concavity has the immense potential of hydroelectric power, the lower graded segment in Assam provides the fertile ground for agriculture but is at the same time most prone to disastrous floods.

The other rivers of Arunachal Pradesh have a concave profile, with steep upper segment near the source. They have a non-existent graded lower segment, as immediately after debouching from the hills, they join the Brahmaputra, after a very short run of around 25 km. All these rivers deeply incised, as can be noticed from the steepness of their profile, nurture huge water power potential.

5.2.2.1 Profiles with a Bulge in the Lower Himalayas and the Piedmont Zone

This is the case of the rivers, descending from the Bhutan Himalayas, and the river Manas is an apt example. Not common in other profiles, this is an indication of the rising Himalayas. The frontal Himalayan zone is rising, and the rivers descending from the upper reaches have not been able to cut through the uplifted mass to give rise to concavity. It is possible the entire Brahmaputra plain west of Guwahati, between the river and the Bhutan hills, is experiencing slow uplift, reflected in the bulging mid-segment of the long profile of Manas.

5.2.2.2 Profiles with a Steep Upper Concavity and a Stepped Mid-Segment

The long profile of the river Barak presents a case of this nature. This kind of profile is common with the rivers flowing in long synclinal valleys. They capture the adjacent parallel or subparallel streams flowing on a higher terrain over a gentle gradient through their transverse tributaries, by breaching the adjacent divide. In a longitudinal profile, these stretches of breached divides appear relatively flat, not conforming to the smooth curve of the profiles above or below the point of capture. Such profiles are common in cases where the drainage pattern becomes rectangular.

These profiles carry the imprint of the geomorphic evolution of the terrain as well as the past history of the river itself, when seen in conjunction with the nature of flood plain and the adjacent fluvial terraces.

5.2.3 Flood Proneness of the Rivers in North-East India

The floods of Brahmaputra and Barak rivers are well known and well recorded. It need not be emphasised that the floods are caused by the excess of flow over the ‘bankfull discharge’. Both the principal rivers of the region are prone to flood.

The geomorphic features of the basin have as much to do with floods as the amount and intensity of rainfall. Heavy rains over long duration are, no doubt, the main reason for causing flood, but the nature of terrain cannot be discounted. One of the principal geomorphic indexes, the ratio between the area of the catchment and the length of the river at any point on the longitudinal profile of the river, will, other things remaining the same, determine the intensity of the flood. Usually, a circular basin with a large area is more prone to flood than a linear basin.

Among the rivers of the North-East India, both the major rivers experience severe floods in their lower courses with the enlargement of the basin. Brahmaputra at Dhubri has a length of about 1,000 km and a catchment area of 178,000 km^2, showing basin-length ratio of 178. Similarly, Barak has a length of 396 km and a catchment area of 28,567 km^2, giving a basin-length ratio of 72. Though both these rivers are prone to floods, Brahmaputra is not only more prone but disastrously flood prone, as witnessed almost every year during the rainy season. It is a different matter that despite a high basin-length ratio, a river may not be prone to floods in areas of scanty rainfall. The situation in Brahmaputra basin is different as besides a favourable basin-length ratio of the river, it experiences heavy rainfall.

Another reason for the Brahmaputra's extreme proneness to flood is a short width of the valley – a mere 70 km – even in its lower courses. The valley is morphologically bound on the north by the Himalayas and on the south by the Meghalaya plateau and its outlier the Karbi-Anglong massif. The Naga Hills, the northern part of the Burmese orographic chain, do not permit the river to swing laterally and widen its valley. Thus, even with its flood plain, the valley is like a compressed furrow, which gets submerged as the flood water rises.

These floods cannot be tamed, but the waters can be channelised in multiple lateral channels technologically created to carry the additional discharge of the river.

References

Das Gupta AB, Biswas AK (2000) Geology of Assam. GSI, Bangalore

Goswami DC (1985) Brahmaputra River, Assam, India: physiography, basin denudation and channel aggradation. Water Resour Res 21:959–978

Goswami DC (1988) Fluvial regime and flood hydrology of the Brahmaputra River, Assam. In: Kale VS (ed) Flood studies in India. Geological Society of India, Memoir 41. Geological Survey of India, Bangalore, pp 53–75

Goswami DC (2007) Flood forecasting in the Brahmaputra River, India. A case study: background to Brahmaputra flood scenario. http://www:southasianfloods.org/document/ffb/index.html. Accessed 9 June 2007

Janardhan K, Gohain BN (1991) Quaternary geology and geomorphology of Brahmaputra valley in parts of Morigaon and Nagaon districts, Assam. Geol Surv India Rec 124(pt 4):41–42

National Atlas and Thematic Mapping Organisation (NATMO) (2004) District planning map series, Planning map of Jorhat District, Assam, Kolkata

Parua PK (1999) Flood management in Ganga-Brahmaputra-Meghna Basin: some aspects of regional co-operation. Civil Engineering Today, ASCE-IS, Calcutta

Sarma JN (2005) Fluvial process and morphology of the Brahmaputra River in Assam, India. Geomorphology 70:226–256

Sarma JN, Phukan MK (2004) Origin and some geomorphological changes of Majauli Island of the Brahmaputra River in Assam, India. Geomorphology 60(1–2):1–19

Water Power Consultancy Services (WAPCOS) (1993) Morphological studies of river Brahmaputra. Ministry of Water Resources, New Delhi

Chapter 6
Weather and Climate of North-East India

Abstract Lying very close to the Tropics, North-East India displays, to a large extent, the character of tropical climate, especially in the valleys. The region has a monsoon climate with heavy to very heavy rains, confined within four summer months from June to September. The southwest monsoon is the main source of rain, and June is the rainiest month. There are three seasons in the area, winter, summer and rainy season, though rainy season, as in the rest of India, coincides with summer months. There is a climatic contrast between the valleys and the mountainous region. While the mean January temperature in the valley region of Assam is around 16 °C, the temperatures in the mountainous region of Arunachal Pradesh and Nagaland hover around a maximum of 14 °C and a sub-zero minimum temperature. The summer temperatures in the plains vary between 30 and 33 °C, while the hills have a mean summer temperature of around 20 °C with a mean minimum of 15 °C. Nowhere in the region, there is heavy snow except in the higher parts of Arunachal Pradesh, like west Kameng and Tawang areas. No part of North-East India receives rainfall below 1,000 mm. Shillong plateau with its southern limit marked by a 1,200-m-high scarp overlooking the Bangladesh plain receives very heavy rains. Cherrapunji, situated on the top of the scarp, receives a mean annual rainfall of 11,465 mm. The average rainfall of Brahmaputra valley is around 2,000 mm with local variations. Guwahati, being in the rain shadow of the Meghalaya plateau, receives only 1,717 mm of rain. About 90 % of the rain is received during the south-west summer monsoon, and June is by far the rainiest month. The hilly areas of the region receive 2,000–3,000 mm of rain, though places like Kohima in Nagaland and Imphal in Manipur, because of their being in the shadow of the mountains, receive less than 2,000 mm of rains.

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6.1 Introduction

Climate is the mean of aggregate weather conditions observed and recorded over a long period of time. The best modern definitions of climate regard it as comprising the total experience of weather and atmospheric behaviour over a number of years in a given region. The weather, on the other hand, is the atmospheric condition at a specific time and place, usually expressed by temperature, pressure, humidity, precipitation, wind direction and velocity and storminess, besides occasionally occurring dust and hailstorms. In most regions and countries of the world, weather conditions are recorded, daily or even hourly, by a network of weather stations equipped with weather instruments and even transmitters, which directly relay the weather information to a Central Meteorological Bureau for collation and public transmission. The density of weather stations determines the level of accuracy in prediction and the production of any generalised picture of climate. Usually, a 30-year period is taken for working out the 'normal' temperature, humidity and rainfall conditions of an area, expressed by means. More commonly, the weather stations compile daily, monthly and yearly data. It must be mentioned that now it is possible to programme the collection of data even hourly, or even for a smaller length of time like every 5 or 10 min.

The factors that affect the climate of a place or a region include the location of a place on the globe, especially its latitude, its insularity or its continentality, more precisely its location in relation to sea, the altitude of a place above the sea level, wind direction and the relief features that permit or restrict the movements of winds. Besides, regions lying in the course of permanent ocean currents or planetary circulation including permanent and seasonal winds are severely influenced in their weather and climate.

6.1.1 Data Source and Weather Station Network

North-East India doesn't have a dense network of weather stations. There are only 30 weather stations, for which normals of weather data are available. In recent years the Indian Meteorological Department has installed a large number of rain gauges spread over the entire region. They also collect data of rainfall and the discharge characteristics of rivers at or near the site of hydroelectric and irrigation projects. The description of climate of the region is based on the normals of temperature and rainfall and stray data for 1, 3 or 5 years have not been used in this study (Fig. 6.1).

6.1.2 Locational Characteristics of the Region

Located between 22° N and 29° N latitudes, the mountainous North-East of India enjoys a subtropical climate mediated by its relief characteristics, drainage orientation

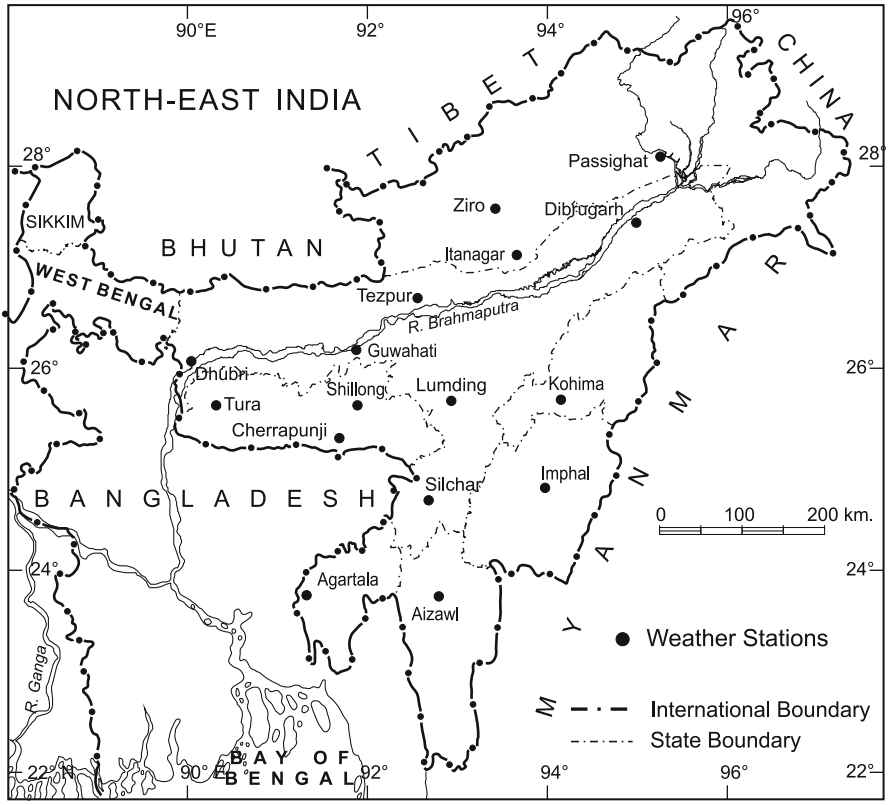

Fig. 6.1 Locations of some weather stations of North-East India

and network and its disposition vis-à-vis the southwest and north-east monsoons. The Brahmaputra plain, like a floating island, varies in altitude from 38 m ASL at Dhubri to 157 m ASL at Pasighat, the place where Brahmaputra debouches from the mountains, after flowing for about 200 km in India, from the Tibetan border to the Assam plain. Most places in the Brahmaputra alluvial plain are less than 100 m above sea level. The other plain areas, besides Brahmaputra plain, are the plains of Cachar and Western Tripura. The heights in these areas range from 16 m ASL at Agartala, the capital of Tripura state, to 97 m ASL at Silchar, on the river Barak. Except the plains of Brahmaputra and Barak, the two principal rivers, which together account for about 25 % of the total area of the North-East, the rest of the region is mountainous with considerable relief and often badly incised. The heights in the hilly terrain range in elevation from 1,200 to 1,500 m ASL for the plateau and hilly states of Meghalaya, Nagaland, Manipur and Mizoram to the towering heights of the Himalayan range, sometimes reaching 7,000 m ASL. The centre of the region is traversed by Brahmaputra, from north-east to southwest, which becomes a reference line from which the land rises into plateaux and hills on both sides.

Thus, the Himalayas in the north and the Meghalaya plateau in the south, and the hills of Nagaland, Manipur and Mizoram, in the east, influence the climate of the North-East. The Barail range, that forms the divide between Brahmaputra plain in the north and the Cachar plain in the south, is another mountain that moderates temperature and influences the distribution of rainfall.

The two most significant factors that affect the rainfall in the region are proximity to the Bay of Bengal and the disposition of other orographic features. The former sends the moisture-charged winds to the region, which lies directly in the course of the Bengal branch of southwest monsoon. The monsoon winds originating from the Bay of Bengal have a natural tendency to move north-east-ward, and a low created over Bangladesh is quite adequate to propel them in the North-Easterly direction. Secondly, the high plateaus and the mountains force the moisture-laden winds to rise, condense into clouds and release heavy precipitation. In fact, the Brahmaputra and Barak valleys girdled by mountains act like a *cul-de-sac*, not allowing monsoon winds to escape or bypass the region.

6.2 General Climatic Conditions

North-East India is the rainiest region of the country. Cherrapunji (25°-15′ N, 91°-44′ E), a place on Meghalaya plateau, 50 km south of Shillong, receives a mean annual rainfall of 11,418.7 mm, the highest in the world. The highest recorded rainfall at the same station was 15,706 mm in 1951. With the exception of a few places like Guwahati and Lumding, the former lying in the rain shadow of Meghalaya and the latter of Barail range, most other places in the region receive around 2,000 mm of rain annually. Much of the rainfall occurs during the period of summer monsoon. The number of rainy days in a year, clustered largely in summer months, varies between 80 and 120 days. Moderate temperatures and relatively high humidity occur in the plains of Brahmaputra and Barak, the two main rivers of the region. These decrease with height in the hilly areas, and reach freezing point at the higher altitudes, in the Himalayan region where some patches of permanent snow are seen on the Indo-Tibet border.

6.2.1 The Seasons

Traditionally, the three seasons recognised in India are winter, summer and rainy season. The monsoon rains occur in summer, and the rainy season largely coincides with the summer season, which lasts from mid-April to mid-October. The winter season lasts in early November and lasts until mid-March. Mid-March to mid-April is a transitional period, which one may also call the spring season. The summer monsoon lasts from May to September, with the highest amount of rain falling in June and July. While the mean temperatures in the plain vary between 15 °C in

January to 28 °C in August, the variations in the hilly areas move to a lower scale with around 9 °C in January (Shillong) to 21 °C in July and August. Closer to the Himalayan ranges, the mean temperatures in January are around 6 °C, and, even in summer seldom, move above 20 °C. No part in the North-East receives a rainfall of less than 1,200 mm, and the highest rainfall occurs in Cherrapunji which receives over 11,000 mm of rain.

6.2.2 Temperature Conditions

The temperatures in the region, as anywhere else, usually vary with height. In the plains of Brahmaputra and Barak, these are relatively equable, yet higher than the bordering mountains and plateaus. The temperatures in the plains, ranging in altitude from 50 to 100 m ASL, are 8–10 °C higher than the temperatures on the plateaus and hills which, with the exception of the Himalayan region, vary in heights between 1,200 and 1,500 m ASL. The temperatures in the higher ranges are much lower. In Brahmaputra valley, the mean summer temperatures linger around 28 °C in the entire valley with a mean daily maximum of around 31 °C for 5 months, from May to September. The mean winter temperatures vary between 16 and 17 °C. But, even in winter, the mean monthly maxima rise to 25 °C with a mean minimum of around 9 or 10 °C (Fig. 6.2a, b).

6.2.2.1 Winter Temperatures

Besides altitude, continentality caused by inland location appears to be a significant factor in determining temperatures during winter season. Temperatures in the valleys and the western part of the region which is closer to sea are subjected to moderating influence of the sea winds. Dhubri, a town on Brahmaputra, located on the western fringe of Assam, at an altitude of 45 m ASL, has a mean minimum temperature of 9 °C and a mean maximum of 24 °C in January. The upper Brahmaputra valley in Assam has similar temperature conditions. At Dibrugarh, another town on Brahmaputra, but located about 650 km upstream from Dhubri, the temperature conditions change only marginally from those at Dhubri.

The role of continentality can be seen in contrasting winter temperatures of two stations, one deep inside Arunachal Pradesh and another just about 50 km from Bangladesh. Shillong (CSO) (25°-34′ N and 91°-53′ E) at an altitude of 1,595 m ASL and Ziro (27°-56′ N, 93°-48′ E) at a height of 1,476 m ASL have similar heights, but very divergent temperature conditions. While Shillong has 14.7 and 5.7 °C as the mean maximum and mean minimum temperatures in January, Ziro has 12.9 and −0.2 °C as the corresponding temperatures for the same month. It is to be noted that Ziro, despite its matching height, is located deep inside Arunachal Pradesh, and does not experience any moderating influence of sea or sea winds loaded with humidity. The winter temperatures are so much influenced by continentality that

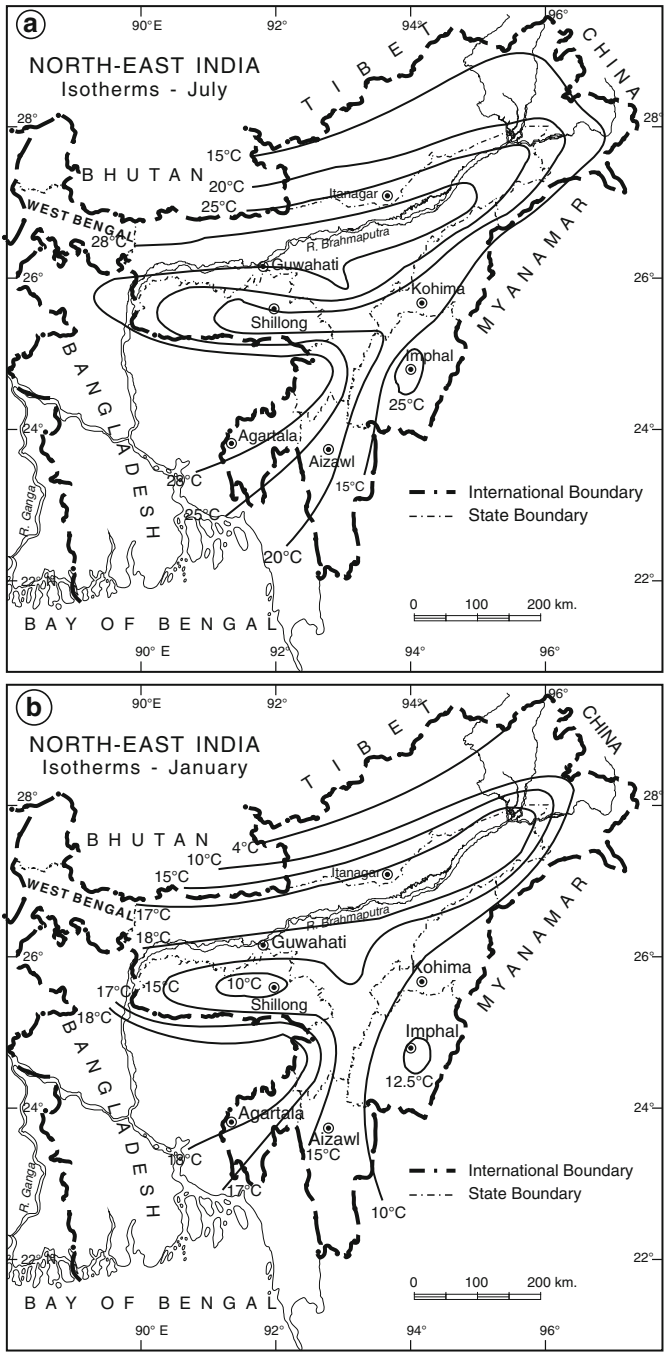

Fig. 6.2 Temperature conditions of North-East India: (**a**) July isotherms; (**b**) January isotherms

Imphal city, the capital of Manipur state, located at a height of 781 m ASL, has a lower mean minimum temperature of 3.7 °C in January, lower than Cherrapunji at 1,313 m ASL having a mean minimum temperature of 7.2 °C. The annual range of minimum temperatures over the entire North-East is around 15 °C, the highest range being for the highest regions.

6.2.2.2 Summer Temperatures

Variation in the timing of the advent of summer, between different parts of the region, is as significant a feature as temperature. This affects the length of summer or other seasons. While at Dhubri the summer arrives early enough in March when the mean temperatures rise to 31 °C and continue at the same level for almost 7 months till the month of September, the highest temperatures at Dibrugarh are attained only in June and July. A greater impact of north-east monsoons at Dibrugarh that manifests itself in higher winter rains and more rainy days moderates and prevents a sudden rise in temperature. The lower Brahmaputra plain has a slightly longer summer, relatively drier winter months and a higher range of temperature in winter than the upper Brahmaputra plain. The summer temperatures show a clear distinction between the plains and the hills. Both, in plains as well the hilly areas, the summer maxima of temperatures vary within a narrow band. The highest summer temperatures in the North-East occur in the West Tripura plain. Agartala, the capital of Tripura, has the highest summer temperature in the region, reaching a mean maximum of 34–35 °C in April.

The summer temperatures in the plains vary between 30 and 33 °C. These are highest in April in the western part of the region. Agartala in Tripura and Dhubri in west Assam have their highest temperatures of 34.2 and 32.7 °C in April. As one moves inland along the Brahmaputra, the hottest month shifts to June or even July. It appears that the maximum temperatures in summer occur just before the arrival of the monsoons. Since the monsoons arrive in the eastern parts a little later, the temperatures continue to rise till late June or even July. What is most characteristic of the summer temperatures in Brahmaputra valley is the phenomenon of minimal variation in their monthly maxima over a period of 6–8 months. Guwahati, the capital of Assam, shows very little variation in its temperature maxima from March (30.2 °C) to October (30.1 °C). For 8 months, March to October, the monthly mean maxima linger around 31 °C. In the inland hilly areas, summers and winters are almost of equal duration, as in Ziro. The monthly mean maximum temperatures in Ziro, though considerably higher than winters, never exceed 25 °C. Unlike at Guwahati, summer at Ziro lasts only from May to October.

The temperature conditions in Cachar plain, drained by the river Barak and centred around Silchar (97 m ASL), demonstrate unfailingly the influence of the sea and proximity to the Bay of Bengal, located as it is just 300 km away from the sea, without any relief barrier that could prevent even the most feeble monsoon winds. The Cachar plain is separated from the Brahmaputra plain by Meghalaya plateau on the west and the Barail range further east and lies about one and half degree south

of Brahmaputra and, to that extent, closer to the equator. In almost all months, Cachar plain has a higher temperature than the Brahmaputra plain, as seen in the temperatures of the two representative towns, i.e. Silchar for Cachar plain and Guwahati for the Brahmaputra plain. The summer lasts from April to October, each of the summer months showing a mean monthly maximum of 31–32 °C and a mean minimum of 20–24 °C. The mean minimum of July and August is higher rising above 24 °C, thus reducing the range. The monsoons and cloudiness moderate the night temperatures all through the year in Cachar plain. Thus, while the places in Brahmaputra valley experience a relatively higher range of temperature during winter, Silchar on Barak, the centre of Cachar, has greater cloudiness and more rainy days that prevent quick nocturnal radiation and bring down the daily as well as monthly range of temperature during winters.

6.2.2.3 Temperatures in the Mountainous Areas of Arunachal Pradesh

Temperatures in the hilly and mountainous areas, which include Arunachal Pradesh, Nagaland, Manipur, Mizoram and Meghalaya, are, as a rule, lower than the plains, all round the year. The lowest temperatures occur in the Himalayan ranges, the highest line of which coincides with the northern boundary of India. From Tawang in West Kameng district to Diphu pass (5,136 m ASL), near the India–Myanmar–China tri-junction, the heights on the international boundary vary between 5,000 and 7,089 m ASL. The highest point on the Himalayan watershed lies about 70 km North-East of Tawang and 30 km east of Tulung pass. All these border areas experience heavy snow during winter, and the temperatures go below freezing point. Bomdila, the head quarters of West Kameng district, Seppa in East Kameng district, Ziro in Lower Subansiri district and Along in West Siang district, all experience snowfall during winters. In fact, much of Arunachal Pradesh lying above 2,000 m contour receives snowfall during winter and experiences a cool weather during summer. At Ziro (1,476 m ASL), about 100 km north of Brahmaputra, as the crow flies, the night temperatures are well below zero in January giving a mean minimum of −0.2 °C for January. There is no other area below 1,500 m ASL which experiences a mean minimum of less than 0 °C in January, though there may be occasional frost or snowfall in extreme cold conditions. In the entire region, there is hardly a patch of perpetual snow cover, except on the Himalayan border of West Kameng district, in western Arunachal Pradesh where a 15–20-km-long glacier exists. The region below 1,500 m ASL, in Arunachal, has a cool summer with an average of about 20–21 °C temperature and a maximum of 25 °C and a minimum of 15 °C. The daily range of temperature is highest in winter when the temperature rises during the day to as much as 15 °C, and a quick radiation during the nights brings the temperature to zero.

6.2.2.4 Temperatures in the Eastern Hills

The weather data of the three weather stations, Kohima, Aizawl and Shillong, give an idea of temperature conditions in the hilly parts of the region. While in the plains, the temperatures are relatively uniform particularly in summer, and the hills show

Table 6.1 Temperature conditions in Shillong and Aizawl

	Shillong (1,500 m ASL)	Aizawl (1,097 m ASL)
Mean maximum for the warmest month	April 24.3 °C	April 27.2 °C
Mean minimum for the coldest month	April 14.3 °C	April 17.9 °C
Mean range for April, the warmest month	April 10.0 °C	April 9.3 °C
Mean maximum for the coldest month	January 15.6 °C	January 20.5 °C
Mean minimum for the coldest month	January 3.6 °C	January 11.4 °C
Mean range for the coldest month	January 12.0 °C	January 9.1 °C

Source: IMD (1985)

wide variations in temperatures depending upon their height and location. Thus, while the mean monthly maximum for Aizawl (1,097 m ASL) reaches 27.2 °C in May, the value is 3 °C lower for Shillong (1,500 m ASL) in the month of July. In all mountainous areas, night temperatures are lower, as compared to the plains, because of lower density of atmosphere allowing higher terrestrial radiation, which brings down the temperature. A low night temperature also brings down the daily and monthly mean, despite higher temperature during daytime. This also accounts for a higher range of temperature at higher places. The two places compared here are Shillong and Aizawl (Table 6.1).

The Manipur Plain: The Case of an Intermontane Basin

The Manipur plain, skirted by hills, is a class by itself. It is an intermontane basin. Imphal (781 m ASL), located in the centre of the Manipur plain valley, has a winter minimum, much lower than what is warranted by its height. Its January mean minimum (3.7 °C) is below that of Kohima (1,406 m ASL) and Shillong (1,500 m ASL) which show a mean minimum of 7.8 and 5.7 °C, respectively, for January. The day temperatures of Manipur in winter are normal lingering around 21 °C and similar to other stations at comparable heights, but it is the extremely low night temperatures that make for a very high range of temperature in January. No place in North-Eastern India has such a low daily range of temperature in winter as Imphal, nor has any place, at a comparable height, such low night temperatures. In fact, Manipur plain experiences similar diurnal temperature as Brahmaputra plain in January, around 23–25 °C, but it is the night temperatures which show a remarkable fall in the case of Imphal, reaching a mean of 3.7 °C in contrast to the plains which have a minimum of 9–12 °C.

This weather anomaly in the case of Imphal, the capital of Manipur, is explained by its location in the valley surrounded by hills on all sides; it suffers from inversion of temperature in winter nights when the cold air of the hills descends to the flat valley lowering its temperature. Besides, the temperatures are not influenced by the winds from the neighbouring region that could import higher temperature and some humidity. Imphal, thus, has the lowest daily range of temperature in the region in January.

6.2.2.5 General Observations About Temperature

The temperatures in the plains as well as in the hills, with the exception of the Himalayas, are more equable in summer as they coincide with summer monsoon, heavy rainfall and cloudiness. The humidity, the atmospheric vapour and the cloud cover prevent quick terrestrial radiation in summer with the result that even in the warmest months that occur at different months in different areas depending on the burst of southwest monsoon, the temperature range is minimal in the warmest months. In Brahmaputra valley, it is June–July–August, coinciding with the rainy months, while in hilly areas like Shillong and Kohima, it is again July and August when the range of temperature is minimum.

Despite a low range of temperature in the summer monsoon months, there are regional variations. Places with higher rainfall and cloud cover have a lower summer range of temperature. Thus, Cherrapunji with the highest summer rains has the lowest average temperature range of 4.4 °C in the month of July, the rainiest period of the year, while it is 9.3 °C in the month of September for Lumding, the place lying in the rain shadow of Barail range and receiving the lowest rainfall in North-East India. The variation in the summer range of temperature is moderate.

Generally, the summers are more equable than the winters. The summer months coincide with the rainy season (June–September) and show higher mean temperature with a lower diurnal range of temperature. The winters have a higher range of temperatures essentially because of cooler nights; the day temperatures show a moderate lowering as compared to the fall in the night temperatures. The summer range of temperature varies from 4.4 °C for Cherrapunji to 9.3 °C for Dhubri in October. The areas close to the Himalayan mountains above 2,000 m ASL experience snowfall during winter and remain cool even during summer months. The winter range of temperatures varies between 9 °C for Aizawl and 9.7 °C for Haflong to 17.6 °C for Imphal in Manipur and 17.6 °C for Kailashahar and over 15 °C for Dhubri. The hilly places have relatively lower diurnal range of temperature than the areas in the plains.

To summarise, one can divide the region into three thermal regimes:

1. The Himalayan areas with cool summer and snowy winter.
2. The Brahmaputra and Cachar plains with higher yet equable temperature during summer and higher diurnal range of temperature during winter. In the plains, the mean winter temperatures are 10–12 °C lower than in summer.
3. Hilly areas of Meghalaya, Nagaland, Manipur and Mizoram with lower winter temperatures have a cool summer and a cold winter, the range of temperature being low, both in summers and winters.

6.2.3 Rainfall

North-East India is the rainiest region in the country and receives much higher rain than the average of 1,000 mm for the whole country. Nowhere in North-East India, the annual rainfall is less than 1,200 mm, but for a large part of Brahmaputra valley,

Table 6.2 Frequency distribution in each class of rainfall in the North-East

Classes of rainfall (mm)	No. of stations	Per cent of stations in each category
Below 1,000	–	–
1,000–1,500	5	3.57
1,500–2,000	30	21.42
2,000–2,500	48	34.27
2,500–3,000	25	17.85
3,000–3,500	15	10.71
3,500–4,000	8	5.71
4,000–4,500	7	5.00
4,500–10,000	–	–
Over 10,000	2	1.42
Total	140	99.95

Source: Memoirs IMD (1962a, XXXI, pt. III)

Meghalaya, Tripura and Mizoram, the annual rainfall is over 2,000 mm. Out of the 140 weather stations spread over the states of the North-East, for which monthly rainfall normals are available,[1] the frequency distribution in each class of rainfall is as follows (Table 6.2):

What is clear is that more than 75 % of the weather stations receive more than 2,000 mm of rainfall and not even 5 % of the stations receive less than 1,500 mm of rain and no station receives less than 1,200 mm of annual rainfall. The five stations receiving less than 1,500 mm of rainfall are:

Lumding	1,233 mm
Imphal	1,412 mm
Lanka (in Nagaon district)	1,242 mm
Maibong (N. Cachar Hills)	1,454 mm
Amarpur (in Tripura)	1,435 mm

These stations lie either in the rain shadow of a mountain range or in an inter-montane basin.

6.2.3.1 Onset of Monsoons

In most parts of North-East region, 1st of June is the date for the onset of monsoons; it may be slightly earlier in Cherrapunji and western hilly parts of Mizoram and Tripura where the monsoon bursts around the 25th of May. These places come under the direct impact of the Bay of Bengal monsoon, blowing over a short stretch

[1] Memoirs of the Indian Meteorological Department Vol. XXXI, pt. III, 1962a.

of Bangladesh before hitting these areas. In Cherrapunji, the normal date for the onset of monsoons is 25th of May, whereas it is 1st of June at Dhubri and a few days later at Dibrugarh and Pasighat.

6.2.3.2 Rainfall Regimes and Seasonal Distribution

Most of the rainfall in North-East India is received during summer, starting from late April and lasting till October. June and July are the rainiest months. The areas on the southern and western borders of the region have early burst of monsoons in May or June and receive the highest amount of rainfall in June. Thus, Agartala, Cherrapunji and Dhubri each has an early start of summer monsoon with a climax in the month of June. Inland, either in the Brahmaputra valley or in the hilly north, the summer monsoon bursts later, in late May or early June, and July is the rainiest month. Thus, Golaghat, Sibsagar, Dibrugarh right up to Pasighat, all the stations receive highest amount of rainfall in July. The southeastern hilly region of Mizoram, being closer to the Bay of Bengal, experiences early monsoons and shows June as the month with highest rainfall. Broadly speaking, June, July and August, the 3 months of summer, are so wet that it is difficult to separate the wettest month except statistically on the basis of mean for each month. For example, Chaparmukh, a place 66 m ASL in Brahmaputra valley, about 70 km east of Guwahati, shows a mean of 400, 490, 441 mm of average rains for June, July and August, respectively (Fig. 6.3).

The Winter Rains

In an unconventional way, one can separate winter from summer by a sudden drop of temperature after summer and a sudden rise after winter. For most stations in the plains, the mean temperatures suddenly drop by about 5 °C from October to November and then rise by 4–5 °C from March to April. For evaluating the contribution of winter and summer rains, the rainfall during the 5 months period from November to March is taken to represent the quantum of winter rainfall, whereas the total rainfall of 7 months, April to October, is taken to represent the summer rains. The Table 6.3 will clarify the picture of winter and summer distribution of rainfall in the region.

Dominance of Summer Rains

All parts of North-East India receive over 90 % of their annual rain, during summer from southwest monsoon. It is as true of Brahmaputra valley with places like Dhubri, Guwahati, Sibsagar and Pasighat, as with the Meghalaya plateau with Cherrapunji and Shillong. Even in the least rainy places, like Lumding and Imphal, the winter rainfall is a miniscule 8 and 11 %. Regardless of the amount of rainfall,

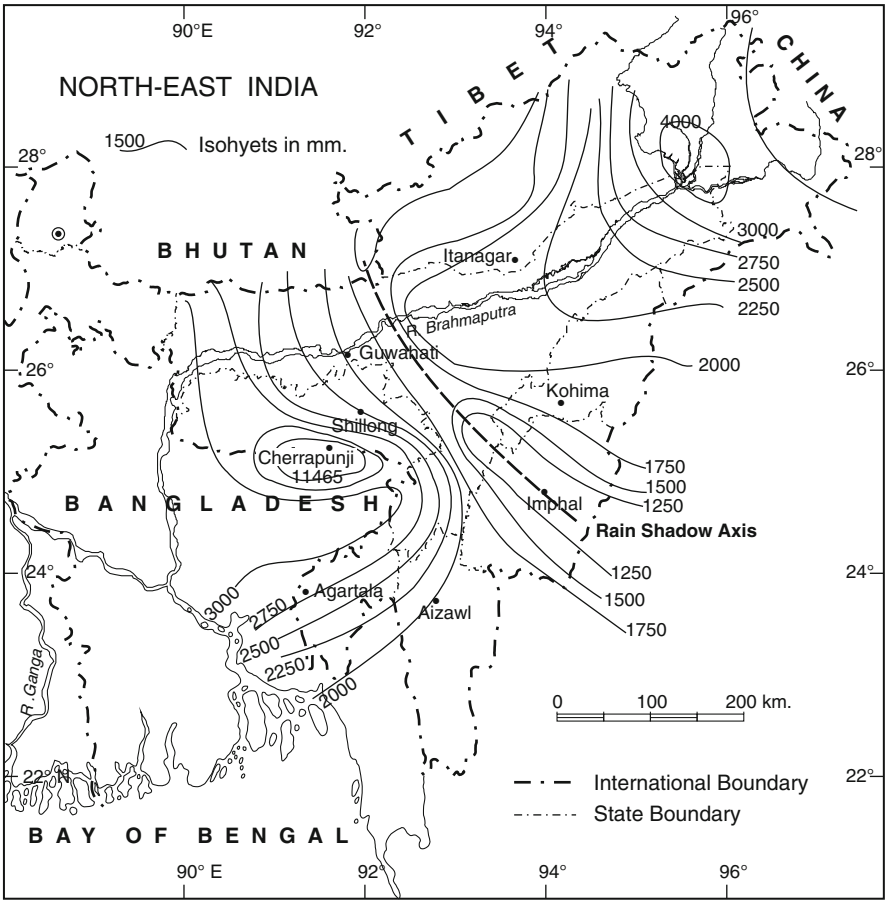

Fig. 6.3 Isohyets showing spatial variation in annual rainfall from West to East in North-East India

the intensity of rain and the rain shadow effects, the summer rainfall always remains the principal contributor to the total precipitation in the region (Fig. 6.4).

The western and southern parts of the region experiencing early burst of monsoons receive the highest rainfall in June. In Tripura, Meghalaya plateau, the western part of Brahmaputra valley, and even in places north of Brahmaputra, but west of Tezpur, June is the rainiest month. As one moves eastwards and upstream along the Brahmaputra, a late burst of monsoon shifts the rainiest month to July. The difference in the amount of rain between June and July is not significant in any part of the region and does not exceed 5–10 %.

The southwest monsoon winds, after they emerge from the Bay of Bengal, move in the north and North-Easterly direction, over the Bangladesh plain without encountering any barrier. Bangladesh receives, on an average, 1,500–1,600 mm of

Table 6.3 Distribution of summer and winter rainfall for selected stations in the North-East

Stations	Annual rainfall (mm)	Total summer (Apr.–Oct.) rainfall (mm)	% of summer rainfall to the total annual rain	Total winter (Nov.–Mar.) rainfall (mm)	% of winter rain to total annual rainfall	% of 3 months winter rain (Dec.–Feb.) to total rainfall
Agartala	2,178.6	2,042.4	93.74	136.2	6.20	1.60
Aizawl	2,244.7	2,088.4	93.04	156.3	6.96	1.70
Chaparmukh	2,766.6	2,655.6	96.00	111.0	4.00	1.38
Cherrapunji	11,465.7	11,072.4	96.91	353.3	3.08	0.53
Guwahati	1,717.7	1,611.7	93.81	106.0	6.19	1.78
Dhubri	2,896.7	2,811.5	97.06	85.2	2.94	0.77
Gangtok	3,580.5	3,309.8	92.44	270.7	7.56	3.00
Goalpara	2,514.7	2,411.7	95.90	103.0	4.10	1.23
Gohpur	2,477.9	2,294.4	92.60	183.5	7.40	3.7
Golaghat	1,898.8	1,774.1	93.44	124.7	6.56	2.94
Haflong	2,285.3	2,049.8	89.60	235.5	10.40	2.45
Imphal	1,353.1	1,202.3	88.86	150.8	11.14	3.99
Kohima	1,856.0	1,729.3	93.18	126.7	6.82	2.12
Lumding	1,233.2	1,133.1	91.89	100.1	8.11	2.90
N. Lakhimpur	3,258.5	3,024.9	92.83	233.6	7.17	3.49
Pasighat	4,376.6	4,049.0	92.52	327.6	7.48	3.80
Dibrugarh	2,588.7	2,355.4	90.98	233.3	9.02	4.00
Digboi	2,601.1	2,332.0	89.65	269.1	10.35	4.10

Source: Calculated from the Climatological Tables of Observatories in India (1931–1960), India Meteorological Department, Government of India, Delhi, 1988

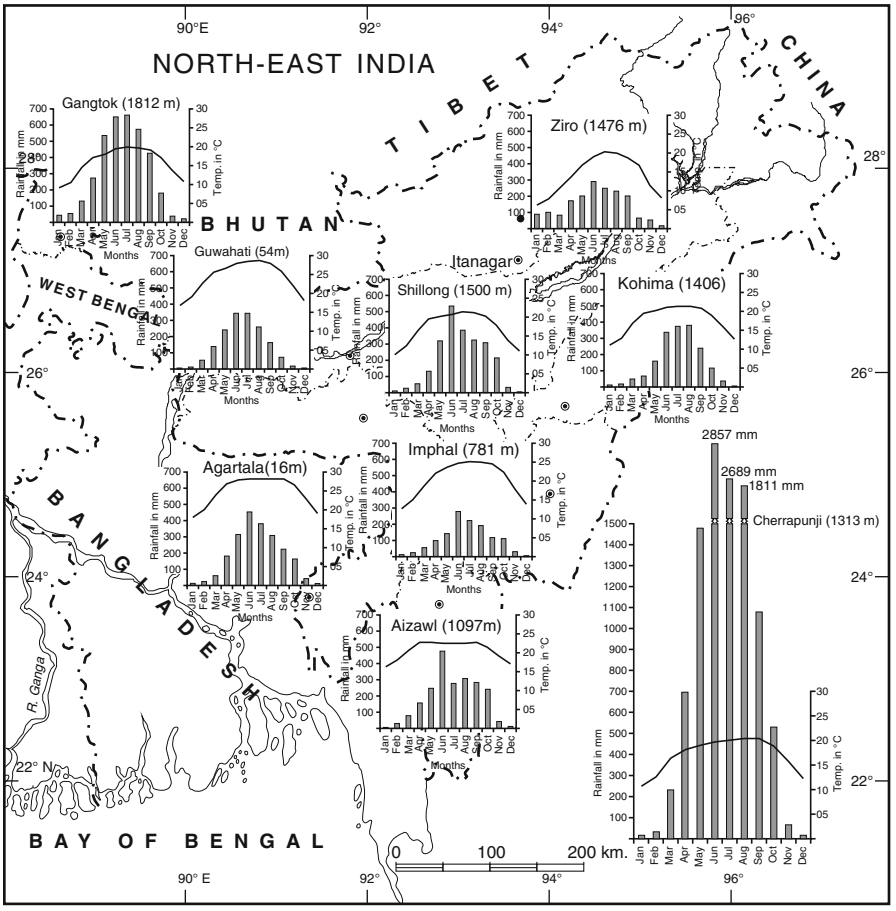

Fig. 6.4 Monthly variations in temperature and rainfall at different weather stations in North-East India

rains annually in its southern part, but as the monsoon winds move further north, they are impeded by Meghalaya plateau and divided into two streams. The easterly branch sweeping the plain of east Bangladesh strikes the Meghalaya plateau and its south-facing scarp that rises steeply over the Bangladesh plain to a height of about 1,300 m ASL. Located almost at the edge of the scarp, overlooking the Bangladesh plain, Cherrapunji, at a height of 1,358 m ASL, receives a mean annual rainfall of 11,445 mm, of which over 95 % is received during summer from the southwest monsoon. Having lost considerable moisture, as the monsoon winds traverse the plateau northward, the rainfall suddenly declines. Shillong, 50 km to the north, receives only 2,418 mm of rains that is not even 25 % of what Cherrapunji receives. Since Shillong is higher in altitude than Cherrapunji, it is not very appropriate to

call the lowering of rainfall as the rain shadow effect. It is essentially the squeezing of moisture from the vertically rising monsoon winds against a wall-like Cherrapunji scarp face that is responsible for lower rainfall in Shillong or in the northern part of Meghalaya plateau. The windward scarp faces always have the benefit of high rainfall with equally high intensity. Immediately south of the scarp, about 40 km south of the Meghalaya–Bangladesh boundary that coincides with the fault scarp, the city of Sylhet (34 m ASL) gets 4,020 mm of rains. Further south of Sylhet, the rainfall decreases, and Dhaka (Dacca) receives a mean annual rainfall of only 2,563 mm.

The other branch of the southwest monsoon, moving north of the Bengal delta, gets further divided into two branches, one moving westward along the Ganga valley and the other turning eastward following the Brahmaputra corridor. Before entering the Brahmaputra valley, the monsoon winds encounter the unsurmountable Himalayas, rise and release heavy rainfall in Jalpaiguri, Buxa, Cooch Bihar and Alipur Duar. Other places, on Bhutan border, receive equally heavy rains (Buxa Duar 5,323.1 mm, Kumargram (on Kokrajhar district border) 4,242.8 mm and Alipur Duar 3,319.1 mm). As the winds move east- and north-east-ward in the Brahmaputra corridor, they lose their moisture progressively, besides expanding sideward. The rainfall amount also decreases eastward from 3,102 mm for Kokrajhar to 2,514 mm for Goalpara, 2,051 mm for Barpeta, 1,929 mm for Rangia and 1,717 mm for Guwahati.

The rain shadow effect of Meghalaya plateau deprives Guwahati of any rainfall from the Meghalaya branch of the southwest monsoon. In fact, Guwahati, with just 1,717 mm of rain, receives the lowest amount of rainfall in Brahmaputra valley; Nowgong, further east, receives a district normal of 1,717.8 mm, the same amount as Guwahati. The Brahmaputra valley between Guwahati and Golaghat receives comparatively less rainfall than at either end, western or eastern. Central Brahmaputra valley suffers the rain shadow impact of not only Meghalaya plateau but also the Mikir Hills. The Kopili valley, sandwiched between the Jaintia Hills in the south-west and Mikir Hills to its North-East, receives much less rains. Lumding (1,233 mm) and Lanka (1,242.4 mm), both in Kopili valley, though administratively part of Nagaon district, receive much less rainfall and represent a relatively dry tract of Assam (Fig. 6.5). Further east in the Brahmaputra valley, the rainfall progressively increases as the valley is compressed between Naga Hills in the southeast and Himalayan ranges in the northwest. The monsoons don't escape the Arunachal Pradesh ranges. At the end of the Brahmaputra valley in Assam, before it turns northward as Siang, there is an amphitheatre-like circle of mountains from which the tributaries of Brahmaputra, principally Dibang, Lohit and Burhi Dihing, descend producing in the process a fan-like network of drainage. Surrounded by mountains, the region is like a cul-de-sac from where the monsoons cannot escape, rise and release copious orographic rains. The pattern of rainfall in the Brahmaputra valley shows a decline from the west to east, reaching a minimum in the central part and rising again North-East-ward till a maximum of 4,376 mm at Pasighat is reached. Pasighat is the point where the Brahmaputra debouches from the mountains and enters into Assam plain.

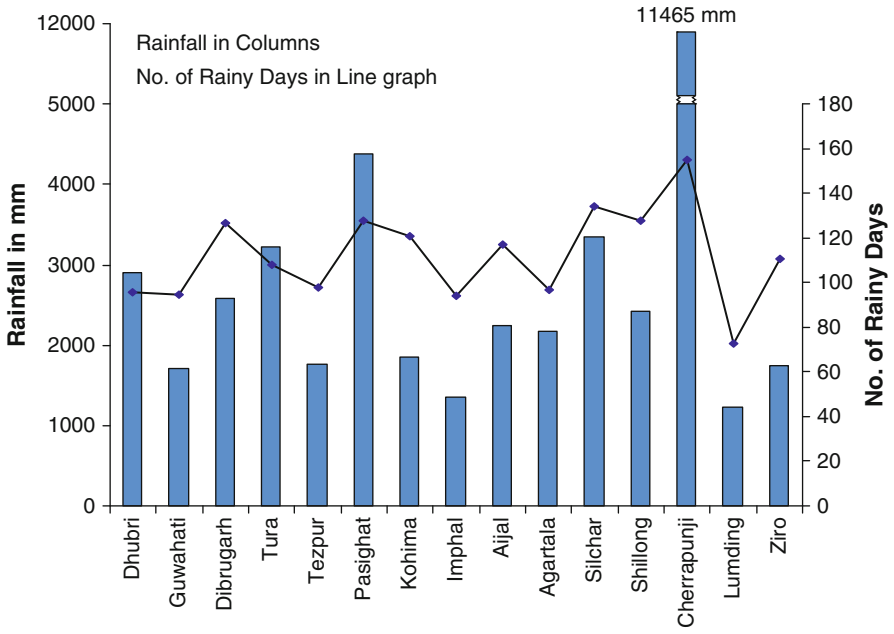

Fig. 6.5 Number of rainy days and the annual rainfall (mm) for some stations from Dhubri to Pasighat

Thus, the valley has three distinct zones of rainfall that show variation in the amount of rainfall from east to west:

1. A rainfall zone, west of Guwahati, receiving over 2,000 mm rain, exemplified by Dhubri which receives a mean annual rainfall of 2,897 mm.
2. A relatively less rainy tract in the central part, coinciding with Tezpur, Nagaon and Lumding cities. Tezpur, on the northern bank of Brahmaputra, receives 1,768 mm of rainfall annually, whereas Lumding has only 1,233 mm of annual rainfall, by far the lowest in Assam.
3. The zone east of Sibsagar up to Pasighat and beyond. The rainfall in this zone rises rather steeply, from 2,000 mm west of Jorhat to 2,589 mm at Dibrugarh and over 4,000 mm further east at Pasighat.

6.2.3.3 Rainfall in Nagaland, Manipur, Mizoram and Tripura

The rainfall pattern for Nagaland and Manipur falls in a different category from that of Mizoram and Tripura. The former two states have a greater continentality, locked in far away from the shores of Bay of Bengal, the principal source of moisture of the summer monsoons. Yet, they receive enough rainfall in their hilly areas. The western part of Nagaland overlooks the Brahmaputra valley, and because of its height receives rainfall from the monsoon winds, which moving up the Brahmaputra valley

also move up the Nagaland plateau. From south to north, the western part of Nagaland receives over 2,000 mm rainfall. Wokha, Mokokchung and Wakching, all on the western fringe of the Nagaland, receive 2,945, 2,945 and 3,204 mm of annual rainfall, respectively. Their situation is similar to Cherrapunji in the sense that these towns, like Cherrapunji, overlook the scarp of Naga–Disang thrust. Though not as spectacular as the Dauki scarp, the Naga–Disang fault scarp acts as an effective orographic barrier to force the monsoon winds to rise and bring enough precipitation. Kohima lying in a syncline and in the rain shadow of Japvo peak (2,040 m ASL) receives a much lower rainfall of 1,856 mm annually. The situation of Kohima is parallel to Shillong in the sense that both lie in the shadow of the mountains, the former of Japvo hills and the latter of Shillong peak. Tuensang, the headquarters of the easternmost district of Nagaland of the same name, and close to the Burmese border, receives 2,080 mm of rains. What is obvious is that except for the places, which are in the rain shadow of some higher hilly areas, most parts of the eastern states receive over 2,000 mm of rainfall. Nagaland–Manipur hills present an area of convergence of the monsoon winds, moving northeast from Brahmaputra as well as Barak valley.

The south Bangladesh and Chittagong branch of southwest monsoon winds, blowing perpendicular to Bangladesh coast and moving over coastal plain of Chittagong, the lowland of Tripura and Cachar, overcome the barrier created by the low and narrow north–south-trending hills of Tripura, Manipur and Mizoram and reach inland, still preserving enough moisture to bring sufficient rainfall. Thus, the places lying in the midst of longitudinal hills of western Manipur and Mizoram receive more than 2,500 mm of rains.

The eastern hilly region, traversed by a series of north–south elongated ranges, alternating with valleys lying between them, receives rainfall ranging from 2,000 to 4,000 mm. The valleys, lying on the lee of these ranges and the lowlands surrounded by hill, receive much less rainfall and represent the rain shadow effect. Thus, Kohima in Nagaland and Imphal in Manipur receive 1,856 and 1,363 mm of rains. In fact, Manipur is the spectacular demonstration of rain shadow effect of Barail range.

The Cachar plain, centred around Silchar, and Tripura receive 2,000–3,000 mm of rains, though Agartala without the advantage of a hilly location receives only 2,178 mm of rain. The situation changes in Cachar plain that falls on the windward side of both the mountain systems, the Barail Range and the Manipur hills, and enjoys over 3,000 mm of rainfall. Silchar receives 3,348 mm of rain.

6.2.3.4 Rainfall Regions

No part of North-East India experiences drought conditions, and even in the rain shadow areas, the places receive 1,200–1,600 mm of rains. One can divide the region into the following pluvial categories:

1. Areas receiving over 3,000 mm rainfall (wet areas)
2. Areas receiving rainfall between 2,000 and 3,000 mm (humid areas)
3. Areas receiving rainfall between 1,500 and 2,000 mm (subhumid areas)
4. Areas receiving less than 1,500 mm of rains (moderately rainy areas)

1. Wet Areas
   In this area, the southern part of Meghalaya in which Cherrapunji and Mawphlang fall; the Cachar plain; the North-Eastern part of Brahmaputra corridor Lakhimpur (3,258 mm), Pasighat (4,376 mm), Tezu (3,102 mm) and Dening (5,317 mm); and Central Mizoram are included. These areas besides having high rainfall have a prolonged rainy season and show minimum variability.
2. Humid Areas
   In this category, the western part of Brahmaputra valley and northern part of Meghalaya plateau, much of Nagaland, Manipur and Tripura, are included.
3. Subhumid Areas
   This includes the central part of Brahmaputra valley that appears like a wedge between the two ends of the Brahmaputra valley. This includes the districts Kamrup, Nagaon and Tezpur right up to Golaghat.
4. Moderately Rainy Areas
   These areas are caused by rain shadow effect. This includes two areas: One in the lee of Barail range and Mikir Hills represented by Lumding (1,233 mm), and the other is the Kopili valley including places like Lanka and Kampur in Nagaon district.

6.2.4 Humidity

The Brahmaputra valley experiences a high level of humidity all the year round. There is no variation in the humidity level of the towns located close to the Brahmaputra in the early hours of the day. Dibrugarh shows 81–87 % of relative humidity in the morning, both in winter and in summer. In the afternoon and evening, the relative humidity level goes down with the rise of temperature in winter, though not so much in summer. Even in the extreme western segment of the valley at Dhubri, the morning hours show high level of humidity. But the humidity in the evening shows seasonal variations. While the monsoon season (June and July) shows a high relative humidity even in the evenings, the range in diurnal humidity level is quite noticeable in winter. In summer, Dhubri shows a relative humidity of 88 and 86 %, in the morning and evening, respectively. The situation changes rapidly in January and February when the relative humidity in the mornings is 84 % but dips to 65 % in the afternoons. The lowest relative humidity, and the contrast between morning and evening, is in the month of March when the relative humidity for morning and evening measures 68 and 46 %, respectively. Similar is the situation in Guwahati where the diurnal relative humidity range is high in January and February (88 % in the morning and 67 % in the afternoon) and very modest in July and August (85 % in the morning and 78 % in the afternoon). The temperature rise in the afternoons brings down the relative humidity level. This does not happen during the monsoons, as the air is always saturated with moisture.

Away from the valleys, in the hilly areas and in the mountainous region, the situation is reversed. Firstly, the daily range of relative humidity is less than in the plains all the year round, and the afternoons show a higher relative humidity than the mornings, in most months. The morning and afternoon relative humidities in Cherrapunji for the month of January are 63 and 80 %, while for July they are 93 and 94 %. Similarly, the relative humidity at Aizawl in January is around 67 % in the morning and 72 % in the evening, whereas in July a much higher level of relative humidity, ranging from 91 % in the morning to 94 % in the evening, is observed. A low level of morning humidity in the hills is the effect of condensation, dew or occasional frost in January, depleting the moisture content of the atmosphere.

Thus, the following types of humidity regimes are recognised:

1. Type 1 is represented by Dibrugarh, where relative humidity is high, all the year round, with a high relative humidity in the morning all the year round and maximum diurnal range in winter.
2. Type 2 is represented by Dhubri, where relative humidity in the mornings and evenings declines in winter months of February and March with a much higher range. Such places show very little or virtually no range of relative humidity in the monsoon months.
3. Type 3 corresponds to places like Cherrapunji and Aizawl, where, in most months, the relative humidity is far less in the morning than in the evening. This is a reversal of the situation from the plains, where the morning relative humidity is usually higher. In Cherrapunji type of humidity regime, the diurnal range of relative humidity is highest in winters by as much as 20 %. The humidity in mornings lingers around 60 % and the afternoon reaching values as high as 80 %. The relative humidity in Cherrapunji in the summer months – May–October – is always between 85 and 95 %, and in June, July and August, the relative humidity level always stays above 90 %. This type represents more equable humidity conditions with minimal range.

Relative humidity has to be seen in the light of temperature and vapour pressure. As a rule most of the places at lower level in Brahmaputra valley have a low vapour pressure in dry winter months and a high vapour pressure during summer monsoons. The variation in relative humidity is caused by variation in diurnal temperature. Thus, a low temperature in the morning shows a high relative humidity, and a high temperature in the afternoon shows a low relative humidity in the evening during winter when the vapour pressure is around 15 mb. In summer the vapour pressure is much higher, and even a high temperature does not bring the relative humidity down in the afternoon.

The low vapour pressure in the hills results from the nocturnal condensation of vapour, following quick radiation of terrestrial heat, and the mornings are devoid of much vapour in the atmosphere, bringing down the relative humidity, despite a low temperature. Thus, in the hills, while the relative humidity is lowest on winter mornings and high in the afternoons, raising the range, it is very high in summer, all through the day with hardly any variation. In the plains, the situation is different.

In winter the plains have a high relative humidity in the morning because of lower temperature and a very low vapour pressure; there is a low relative humidity in the afternoon because of rise in temperature during the day. This raises the diurnal range of the relative humidity. In summer, the vapour pressure increases enormously and the relative humidity remains high at any temperature. Thus, summer is marked by constant high humidity, both in the mornings and in the afternoons.

6.2.5 Wind Direction and Storms

The areas and places most exposed to strong winds and storms are those, which are at a considerable height, facing the winds directly. Places like Cherrapunji and Aizawl, lying at 1,313 m and 1,097 m ASL, respectively, are most exposed to strong winds and thunderstorms. Besides their location at higher altitude, these directly face the southwest winds from the Bay of Bengal. Between the extremes of windy weather at Cherrapunji and Aizawl and a relatively calm weather at Shillong, there are places in Brahmaputra valley, which experience more stormy weather during monsoon and are quiet in winters.

One of the places, which experience a relative calm in winter and stormy weather in summer, is Shillong. Rising above the Brahmaputra valley and away from the windward location like that of Cherrapunji, the city enjoys a high degree of non-windy weather, both in the mornings and in the evenings. The number and frequency of calm days is higher in winter than in summer. In winter, 70–75 % of the days experience a calm weather. And even in summer, the windy days don't exceed 50 %. This relative calm is broken with the arrival of summer. April, May, June and September have thunderous days, and in May, every alternate day has a thunderstorm. Shillong is least windy in winter and quite thunderous during summer and monsoons.

6.2.5.1 Thunderstorms

Thunderstorms visit the North-East region in association with southwest monsoons during summer, extending from March to September. Storms are rare during winter. The largest number of storms during summer occurs at Shillong. April, May and June in summer, and September in autumn, are the months with the highest frequency of thunderstorms, with at least ten stormy days in each month. The city represents a zone of convergence between the southwest monsoons, picking strength, and moving from the south and the rising winds from the Brahmaputra corridor spreading sideward, an ideal situation for the genesis of a thunderstorm. Most places in the Brahmaputra plain have five to six thunderstorms in a summer month with the maximum number reaching in May and September. The beginning of

monsoon, i.e. pre-monsoon period of March, April and May, also witnesses thunderstorms that are moderately severe.

Sibsagar is another place in the Brahmaputra valley that faces a high frequency of thunderstorms, 10–12 storms every month during the monsoon period. The descending air from Naga Hills in the south to southeast, as a result of inversion of temperature, may be the reason. The relative constriction of upper Brahmaputra valley, as one moves upstream, by the hills approaching from both sides – the Miri and Dafla hills of Arunachal Pradesh from the north and the Mikir and Naga Hills from the south – forces the monsoon winds vertically up, not only bringing heavier rains but also causing storms. During the rainy season, however, nowhere the storms are as frequent as in Shillong, almost twice every week.

6.2.5.2 Wind Direction

The main components of wind direction are south–southwest and north–North-East, both in alignment with southwest and North-East monsoon winds, and more or less even parallel to Brahmaputra.

Daily Movement of Winds

The Brahmaputra valley shows a dominance of north north-easterly winds in the mornings, whereas the afternoons show a dominance of south southwesterly winds. This applies especially to the western part of Brahmaputra valley. In the upper Brahmaputra region, around Dibrugarh, north-easterly winds are dominant, both in the mornings and in the afternoons. What is intriguing is that even during summers, the period of southwest monsoons, the northerly and north-easterly components of winds are dominant in the mornings. This could be ascribed to the descending mountain winds and the pressure gradient that follows the overnight cooling of the eastern part of the valley, creating a moderate pressure gradient from east to west, and inducing low-velocity feeble winds to blow down the river towards a slightly lower pressure area westward. It is only in the afternoons that the southwesterly winds become dominant and blow as the monsoon winds.

The places, which have a high wind velocity all the year round but higher during the monsoon season, are Cherrapunji and Dhubri. The former, overlooking the Bangladesh plain from the scarp head of Dauki fault, receives the unmitigated force of southwest monsoon winds, and the latter located on the Brahmaputra bend where the winds enter the Brahmaputra valley from West Bengal–Bangladesh plain. These winds are confined between Meghalaya plateau and Bhutan Himalaya and escape up the Brahmaputra valley with speed. This is the case of free-blowing winds over the plain, getting constricted and funnelled into Brahmaputra valley with an increase in speed and vertical rise, causing thunder, rain and even storm.

6.3 Climatic Divisions of the North-East

With the exception of Brahmaputra plain having a width of 70–80 km, and Kopili and Dhansiri valleys and the small plains of Cachar and Tripura, much of North-East of India is hilly and mountainous, where terrain is an important climatic determinant.

The above mentioned plains, lying below 100 m ASL, have a climate, very different from the climate at higher altitudes in Meghalaya, Nagaland, Mizoram and Arunachal and peripheral regions of Manipur. The temperatures vary markedly as much as the amount and intensity of rainfall: One would divide the region into three type areas, each having a climate different from others. The similarity in climates of these areas is restricted to the source and seasonality of rainfall. All places receive rain largely during summers from southwest monsoon. The height and aspect also make the difference.

If one goes by the simple primary classification of 'Koeppen', the region is divided into two zones. Part of Manipur, Tripura and Mizoram and Cachar plain lying below 25° N latitude fall in the category of 'A' climate (tropical climate), and the remaining northern part consisting of Meghalaya, much of Assam, northern Manipur, Nagaland and part of Arunachal Pradesh fall in 'C' climate (warm temperate mesothermal climate). These areas lying between 25° and 35° N latitudes show an average winter temperature above −3 °C but not above 18 °C. The northern part of Arunachal consisting of the Himalayan ranges is put under 'D' class (snow microthermal climate). The coldest month has an average temperature below −3 °C, and the warmest month shows a temperature of over 10 °C.

Thus, the region has three classes of climate following Koeppen, i.e. 'A', 'C' and 'D'. These could be further qualified. These classes are based on their latitudinal range and temperatures during summer and winter and could be qualified with rainfall conditions. By further subdivision, the following types of climate emerge in the North-East region.

6.3.1 A Type

Tropical wet–dry climate – (Aw) – This is tropical rainy climate with dry winters. This covers Tripura and Cachar plain and can be extended to Mizoram and southern Manipur despite their greater heights and slightly lower temperatures in winter as compared to Tripura. Tripura climate 'Aw' could be qualified with 'a', a subscript meaning the warmest month has a temperature above 22 °C. For Mizoram, the temperature of the warmest month being below 22 °C, subscript 'b' is affixed. Thus:

'Awa' – type – includes Tripura and Cachar plain
'Awb' – type – includes Mizoram and Southern Manipur

6.3.2 C Type

The region north of 25° latitude is classified under 'C' category where further subdivisions are made. 'C' is warm temperate (mesothermal) climate, where the coldest month has a temperature of less than 18 °C but above −3 °C. The following subdivisions are found:

'Cfa' – Humid subtropical climate – rainy and hot summers
'Cfb' – Humid mesothermal with warm summers
'Cfc' – Humid mesothermal with short and cool summers

All the three subtypes are alike, with changes only in the nature and length of summer. In case of North-East, it includes both, areas in higher latitudes and those at altitudes. The regional distribution is as follows:

'Cfa' – The entire Brahmaputra valley up to an altitude of 500 m ASL. This type of climate occurs in the Brahmaputra plain, from Dhubri to Pasighat, and extends into the valleys of the tributaries for some distance.
'Cfb' – The land from 500 to 1,500 m ASL, which includes the eastern ranges of Nagaland, Manipur and Arunachal Pradesh above 500 m and below 1,500 m ASL. Here the summers are warm.
'Cfc' – The land above 1,500 m ASL, which includes Meghalaya, part of Nagaland, northern Arunachal Pradesh, having short and cool summers.

6.3.3 D Type

The highland climate of the northern most part of Arunachal Pradesh where the temperatures in winter fall below 0 to −3 °C, and summers are also not warm.

Thus, the region is divided into six types of climate.

6.3.4 Climate and Biosphere: Relationship and Impact

Climate is by far the most important determinant in the creation of a biosphere and the variety of life forms that constitute a specific biome. The climatic conditions in the North-East region with abundance of rainfall have shaped the floral landscape and provided the necessary habitat for different zoological species. Some of the most luxuriant forests with enormous diversity are found in North-East India, and part of the region is defined as a biological hotspot meant to preserve the biodiversity. The valleys were the first to be colonised by the humans in the region. It is difficult to evaluate the influence of weather and climate on the people of the region. The idea of an enervating climate that turns people lethargic is highly contentious, and it is more plausible to keep away from the deterministic theory of an optimal climate.

What is clearly visible is the unfailing stamp of climate not only on the vegetation, particularly forests, but also on the type of agriculture and horticulture of the area. The dominance of rice culture and tea plantations, two of the most visible characteristics of Assamese agricultural economy, owes their existence and importance to the climate of the region.

References

India Meteorological Department (IMD) (1962a) Monthly and annual rainfall and number of rainy days based on records from 1901–1950. Memoirs IMD, vol XXXI, pt. III

India Meteorological Department (IMD) (1962b) Monthly and annual rainfall and number of rainy days, period 1901–1950, part IV B. Govt. of India, Pune, Printed by Govt of India Press, Nasik

India Meteorological Department (IMD) (1985) Climatological tables of observation from India (1931–61). Govt. of India, Pune

Sarkar RDG (1981) A study in trends and periodicities of rainfall over Brahmaputra catchment. Basin hydrology. Monograph no. 9. IMD, Govt. of India, Pune

Singh S (2007) Rainfall runoff conditions in Meghalaya Plateau, a case study of Paham Syiem watershed, Research monograph. NEHU, Shillong

Syiemlieh HJ, Das P (2004) Orographic effects on the distribution of rainfall in North-East India. TIIG 26(1):12–20

Chapter 7
Natural Hazards in the North-East Region of India

Abstract North-East India is afflicted by three main natural hazards: floods, earthquakes and landslides. Of these, the earthquakes are most unpredictable. Earthquakes are generally grouped under four categories depending on their severity, measured on the Richter scale. In common parlance, these are known as 'slight', 'moderate', 'great' and 'very great' earthquakes. These categories, on the Richter scale, measure as <4.9, 5–6.9, 7–7.9 and >8, respectively. The frequency of these earthquakes varies with the intensity of the earthquakes, slight earthquakes occurring more frequently than the great or very great ones. The low-intensity tremors occur quite frequently in the contact zone of plate boundaries or along the lines of structural weakness, like the Main Boundary Fault (MBF) or the Main Central Thrust in the Himalayan region or along a chain of thrusts extending from Lohit district (with Mishmi fault) in the north to Manipur and further south. From the mid-nineteenth century till date, there have been seven earthquakes with an intensity of >7.0 on the Richter scale, of which the two occurring in 1897 and in 1950 were very severe, the first one measuring 8.7 and the second one 8.5 on the Richter scale. The earthquake of 1950 not only caused tremendous loss of property and life, but even changed the course of many rivers including the morphology, especially depth profile of Brahmaputra.

Floods are a recurring annual feature of Assam when Brahmaputra and its tributaries, with very large catchments, are flooded exceeding the limit of bankful discharge and submerge a substantial part of Brahmaputra plain. In very severe floods, three to four million hectares of land are affected. These floods occur between May and September, the period of summer monsoon. The floods affect the crops, cause erosion, breach embankments, wash away cattle, destroy houses, uproot trees and even affect the wildlife sanctuaries.

Natural hazards are caused by a loss of equilibrium in the crust of the earth, or its atmosphere, unleashing a chain of events that manifest themselves in natural hazards. An earthquake, a volcanic eruption and a tsunami owe their origin to an

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accumulation of stress and its release, or some loss of equilibrium, in the crust of the earth. Similarly, atmospheric disturbances produce disastrous cyclonic storms that cause tremendous damage to society. Cyclones and floods are the frequently occurring and most commonly recognised natural hazards that have their origin in the atmosphere. A snow avalanche, a landslide, a rock fall or even a simple slope failure always results from some disturbance somewhere. All these natural hazards, regardless of their origin and depending on their intensity, cause huge loss of life and property and occasionally change the appearance of the land they visit.

Natural hazards are the balancing acts of nature and existed even before the humans arrived on the scene. Since many of these balancing acts of nature affected humanity adversely, we labelled them as natural hazards or natural disasters.

Natural hazards are episodic and their occurrence cannot be predicted much in advance. While incidents like earthquakes occur suddenly without any prior indication, those related to atmosphere, like cyclones and floods, involving the process of their development and movement, offer enough indication of their visitation, a day or two in advance. This helps in taking mitigating measures to avert or lessen the impact of such natural hazards.

In the context of the North-East region, the most common natural hazards are:

1. Floods and droughts
2. Earthquakes
3. Landslides

Each one of these could be variously destructive depending on the severity of the event.

7.1 Floods

The two principal rivers of the region, Brahmaputra and Barak, have an annual flood regime. There is no monsoon period, when the mighty Brahmaputra does not experience floods. The only variant is the severity and destructiveness of the flood. Sometimes, a flood is accompanied by another hazard, as it happened on the 15 August 1950, when a flooded Brahmaputra experienced the most severe earthquake of the century, causing unprecedented damage to the profile of the river and the regional landscape as much as to the people and their property.

7.1.1 Causes of Floods in Brahmaputra

The floods in Brahmaputra, as in any other river, occur when the discharge at any point on the long profile of the river exceeds the bankful discharge of the river. In deeply incised channels, there is hardly any chance of flood: an increase in

discharge remains confined in the deep gorge like channels of the rivers. But, in open channels, dovetailed with their flood plains, a very high discharge, when it exceeds the bankful discharge capacity of the channel, spills onto the flood plain, causing floods.

The three factors that can be directly related to floods in the Brahmaputra are as follows: (1) intensity of rainfall, (2) gradient of the longitudinal profile of the river in the region and (3) basin ratio, i.e. the area of the catchment, divided by the length of the river, at a specific point on the river. This would be determined largely by the shape of the basin. There could be exceptions, as in the case of deeply incised river channels.

7.1.1.1 Amount and Intensity of Rain

It need not be emphasised that Brahmaputra catchment, in India, receives a relatively heavy rainfall. The mean annual rainfall for the entire catchment, in India, is 2,678 mm with a coefficient of variation of 8.2 % (IMD 1981). Hourly intensity of rainfall being an unavailable, daily intensity of data for the rainiest month is obtained by dividing the rainfall of the month by the number of rainy days in the month. Leaving aside a few places, like Lumding in the rain shadow of Barail range, most places in Brahmaputra valley receive an average daily rainfall of 20–35 mm, during the rainy months. The heavy episodic rainfall associated with depressions lingering in the catchment of the river, is what gives the river a sudden high discharge, progressively increasing downstream. The most recent case of high-intensity rainfall in Assam was in June 2012, when Assam received nearly 510 mm of rainfall between 1 June and 27 June, 31 % in excess of normal rainfall of 388 mm. The result was the most devastating flood of the decade.

7.1.1.2 Longitudinal Gradient

The distance between Dibrugarh (111 m ASL), an easternmost town of Assam on Brahmaputra, and Dhubri (45 m ASL), a westernmost town of Assam, beyond which the river enters Bangladesh is roughly 650 km. The difference in the height of these two towns on Brahmaputra is 66 m. This gives a descent of roughly 1 m from east to west, for every 10 km length of the river. Even, this gradient is variable as the slope declines westward. This very low gradient is partly responsible for the floods in Brahmaputra.

7.1.1.3 Basin Ratio

The catchment of Brahmaputra at Dhubri, including the area of Bhutan, is roughly 220,000 sq km. Taking the length of Brahmaputra in India to be around 850 km, the

basin ratio will come to 260 km^2 of catchment, per km length of the river at Dhubri. This ratio will change from point to point depending on the shape of the basin. But, this ratio is quite substantial to cause floods in an area having an annual mean rainfall of over 2,500 mm and a river gradient of 1 m for every 10 km length of the river.

7.1.2 Discharge Characteristics and Floods in Brahmaputra

The floods in Brahmaputra, as well as in Barak, occur during the period of summer monsoons, more commonly between July and August when the rivers have the maximum discharge. Brahmaputra has an average annual discharge of about 19,200 cumecs (678,000 cusecs) which is nearly twice that of Ganges (Parua 2003), though for a period of 35 years Sarma (2005) has given a mean annual discharge at Pandu to be 16,682 cumecs. The maximum discharge of Brahmaputra as computed for the purpose of designing a bridge on Brahmaputra at Pandu (Guwahati) was measured as 19.5 lakh (1.9 million) cusecs, and the corresponding discharge at Dhubri was reckoned to be about 22 lakh (2.2 million) cusecs (Hazarika 1990). The highest ever recorded flood discharge in Brahmaputra at Pandu (Guwahati) was 72,148 m^3/s in 1962 (Goswami 1998, 2007). The maximum discharge of Barak flowing through Cachar is 181,000 cusecs (5,122 m^3/s).

Brahmaputra has a catchment of 178,213 km^2 in the North-Eastern states of India, of which about 47 % is in Arunachal Pradesh, over 40 % in Assam and 6 % each in Nagaland and Meghalaya. With an average rainfall of 2,678 mm, the basin receives 485 billion cubic metre of water, all discharged finally through the principal river Brahmaputra, much of it during the four monsoon months from June to September. The valley is 70–75 km wide, bordered by rising mountains on both sides of the valley, north and south. The channel, about 5 km in width and lying in the centre, is highly braided, with a series of streams criss-crossing a number of sandbars and islands which occur all through the length of the river, in Assam, a distance of 750 km, from Pasighat, where the river leaves the mountains of Arunachal Pradesh, to Dhubri where the river turns southward to enter in Bangladesh. Besides the normal discharge, it has to transport a heavy sediment load brought by the tributary streams, over a very gentle gradient of 10–12 cm/km.

7.1.2.1 The Area Affected by Floods

With the exception of Karbi-Anglong and North Cachar hills, all the districts of Assam are affected by floods. The districts which receive maximum impact are Dibrugarh, Dhemaji, North Lakhimpur, Sonitpur, Bongaigaon and Dhubri. Usually, the districts on the northern side of Brahmaputra are more susceptible to flood, because of important tributaries of Brahmaputra, like Subansiri and Kameng, joining the Brahmaputra on the northern bank. These tributaries with their large catchment contribute not only a large discharge but even a disproportionately large sediment load that adds to the impact of the floods. The excess load beyond the capacity of the main river is dumped on its flood plain, damaging at least temporarily the field and the crops.

Table 7.1 Severe flood years in Assam

These years were marked by floods submerging the northern bank of the river	1897,1910, 1911, 1915, 1916, 1931
Flood years in Assam	1950, 1954, 1962, 1966, 1972, 1974, 1977, 1978, 1984, 1986–2000 (each year)

Source: Revenue Department, Government of Assam:1

The area affected by Brahmaputra floods varies from one to three million hectares, but in years of unprecedented floods, as it happened in 1988, almost half the area of Assam (i.e. four million hectares) is affected, and over a million hectares of crops are damaged. In 1987–1988, over 100,000 cattle were lost, and the loss of human lives amounted to over 200. The floods are virtually an annual feature, only some years like 1978 are flood-free. Sometimes, these floods occur in successive waves depending on the prolonged duration of the depressions over the valley bringing heavy rainfall.

Besides the main reasons for the floods, explained earlier, that lead to a very high discharge, much above the bankful discharge of the river, there is an additional reason. All through the history of Assam, successive ruling dynasties have built embankments on both sides of the river, largely to protect the land and the villages from high floods, but equally to use these embankments as perennial land routes. Today, Assam has 4,465 km of embankments along its rivers. A breach or two in these embankments, during the floods, exposes the area behind these embankments to flood fury, not only inundating villages and croplands, but sometimes even washing away people.

The severe flood years in Assam are recorded in Table 7.1:

The floods in Brahmaputra occur any time between May and September, though July and August show the highest frequency of floods. The number of years that witness flood in Brahmaputra is far greater than the number of flood-free years. Besides the visible impact like destruction of cropland, submergence of villages and loss of life and property, there are also changes in the course, profile, depth and level of sedimentation in the course of the river. Almost the entire course of Brahmaputra in Assam is braided and the nature of braiding changes after every flood. Silting of the river channel is also affected every year. It is estimated that the river has over 6 m thick sand deposit in its course. In some parts of flood-affected areas, soil erosion also occurs.

The most severe flood years were 1987 and 1988. The impact of floods on Assam's land and people from 1973 to 2000, as reported by Revenue Department of Government of Assam, is noted below.

7.1.2.2 Impact of the Floods

The floods in the river not only mean exceptional discharge above the bankfull discharge level; it also implies bank erosion in some areas and deposition of sediments in others. Other changes include breach in embankments, destruction

Photo 7.1 Brahmaputra in flood (Photo Dasrath Deka)

of crops, houses and damage to other properties. Cattle are washed away, trees are uprooted and wildlife is threatened and often perishes in the process of emergency migration (Photo 7.1). Many plants and animals suffer huge and sometimes irreparable damage. Some of the wildlife sanctuaries like Kaziranga suffer greatly, as animals trying to escape meet death in road accidents. Others are caught by unsocial elements.

The impact of the flood is usually assessed by the damage caused to the people, their life and property and to the economy of the region in general. Besides, there are also damages to public property like roads and bridges, public buildings and means of transport and communication. It takes time to recover from the ravages of the floods, and some time the impact lasts for several years. The landscape of the areas and the economy are also affected in different ways, as the work of rehabilitation of the affected people and the repairs of infrastructures slows down the economy. The concrete way in which damages are assessed is by the area affected, loss of human life and cattle, population affected, cropped area damaged and damages to house property, crops and public utilities and other infrastructures. Some of the details of the losses caused by floods in Assam are given in Table 7.2, through a summary of flood damages in Assam, for a period of four decades (1953–1995).

The severity of the floods in Brahmaputra varies from year to year. But the most severe flood in the river occurred in 1988, the year of maximum damage to life and property in the state. The 1988 flood in Brahmaputra was by far the most devastating known in the history of Assam. Roughly 38,000 km^2 of land, almost half the area of the state, was affected during floods in 1988, damaging 12,000 km^2 of cropped land and half a million houses in the state. If the hilly areas of Karbi-Anglong and North Cachar hills were to be excluded, about three-fourths of the area of Assam went

Table 7.2 Summary of flood damages in Assam (1953–1995)

Îtem	Total	Maximum
Area affected	41,600 km^2	38,200 km^2 (1988)
Population affected (in millions)	98.10	10.47 (1987)
Damage in crops		
(A) Area	50,800 km^2	11,300 km^2 (1988)
(B) Cost (Rs. crores)	3288.31	334.10 (1988)
Damage to houses		
(A) In numbers	33,27,189	4,99,835 (1988)
(B) Cost (in Rs. crores)	296.80	103.92 (1988)
Number of cattle lost	431,537	108,913 (1987)
Number of human lives lost	1,724	226
Damage to public utility in Rs. crores	832.42	255.82 (1988)

Source: Revenue Department, Government of Assam:2

Table 7.3 Damages caused by Floods in Assam

Nature of damage	1973	1978	1983	1988	1992	1998	1999
Area affected/lakh (100,000) hectares	10.262	3.06	7.36	38.2	2.31	9.66	2.23
Cropped area affected/lakh hectares	2.94	1.18	NA	1.13	0.042	2.89	NA
No. of villages affected	NA	NA	NA	NA	NA	5,298	1,503
Population affected (in lakhs)	22.09	9.17	22.57	84.1	9.71	NA	8.9
No. of houses damaged	29,596	NA	NA	618,272	15,117	29,791	NA
Human lives lost	19	02	23	232	12	102	03

Source: Revenue Department, Government of Assam:5–8

under water in 1988. The severity of soil erosion is the highest in North Lakhimpur district followed by Darrang and other districts. The 1990s were the years of severe floods in Assam (Table 7.3)

It must be noted that the area submerged and the areas with maximum damage to crops don't always coincide and depend on the timing of the flood. Very early floods, like the one in May, do not cause much damage to the crops.

It is generally believed that the frequency and severity of floods in Assam have increased during the recent decades. The increased frequency is attributed to a number of factors like deforestation in the catchment, increase in the area of cultivated land and building up of a large number of cultural features, particularly the railroads and bridges that have the effect of constricting the channel flow and forcing it to rise. The hills of Karbi-Anglong as well as those of Kamrup district restrict the floods from spreading much to the south, though rising floodwaters of Brahmaputra block the free flow of its tributaries like Kopili and Dhansiri, in their confluence zone, which, in a condition of choked flow, rise in floods. There is no cyclic occurrence of floods, though there are casual observations that a severe flood is a triennial phenomenon. Besides Brahmaputra, the river Barak, in the southern part of the state, draining the districts of Cachar, Karimganj and Hailakandi, is periodically in spate, but the floods are not as severe as in Brahmaputra (Table 7.4).

Table 7.4 Group of districts in Assam shown according to severity of floods

Districts almost immune to floods	Districts with light to moderate floods	Districts with severe floods	Districts with very severe floods
N. Cachar, Karbi-Anglong, Kokrajhar, Bongaigaon, Tinsukia	Dibrugarh, Cachar, Darrang	Goalpara, Kamrup, Sibsagar	Lakhimpur, Dhemaji, Golaghat, Jorhat, Barpeta

In a severe flood, roughly 5,000 villages, i.e. about 20 % of the total rural settlements, are affected and 10,000 km^2 of land, i.e. about 12–13 % of the area of the state, is submerged. It was only in the exceptional flood of 1988 that over half the area of the State was affected. It is estimated that 'Assam has lost 429,000 ha (4,290 km^2) of land, roughly 5.5 % of the area of the state to river bank erosion, with 130,000 families left landless' (Kashyap 2012).

7.1.2.3 A Brief Description of Assam Flood of 2012

A brief account of Assam flood, as it occurred in July 2012, is provided here to give a glimpse of the floods in Assam. The last severe flood in Brahmaputra before 2012 occurred in 2004, after which several measures were taken by the State as well Central Governments. The flood of 2012, despite the safety measures undertaken by the State Government and the National Disaster Management Authority, proved quite disastrous. The floods have washed away 20 bridges and culverts and damaged 191 bridges, besides washing away approaches to 575 bridges and 230 culverts. The river has breached embankments in Tinsukia, Dhemaji and Sonitpur districts and on the river island of Majuli. At least 77 people have lost their lives. Around two million people are affected and nearly half a million are temporarily accommodated in relief camps (Kashyap 2012). Many of the villagers remain stranded in knee-deep water in their houses, for fear of losing their belongings.

7.1.2.4 Floods in Arunachal Pradesh

The lower regions of Arunachal Pradesh, bordering Assam, are susceptible to minor floods. The floods occur in lower regions of Subansiri, Ranga and Dirang valleys. The district of Pasighat, where Siang (later known as Brahmaputra) debouches from the mountainous region, also experiences floods in some years. The northern tributaries of Brahmaputra, still in a phase of incision, collect not only the rainfall of their catchment but also a large sediment load derived from the stripping of the weathered mantle, perched on the divides and the valley side slopes. Flowing on a steep gradient, the two principal northern tributaries, Subansiri and Kameng, rising at around 3,000 m in the Himalayas, join the sluggishly flowing Brahmaputra, at around 100 m ASL. During high waters, Brahmaputra, the principal river, chokes the flow of water from these tributary streams, causing flood in their lower reaches and

forcing them to dump their sediments transported from upstream, in the confluence region, giving rise to a river delta. It may be noted that Subansiri has turned southwest wards, avoiding the river island of Majuli, which is like a river delta, formed by Subansiri at its earlier confluence with Brahmaputra.

7.1.3 Flood Control Measures

The most common practice to protect the land from the fury of the flood is the building of embankments. This kind of device has existed in Assam from the medieval periods. The Ahoms and the Koches were the patron builders of such embankments, which, while saving the territory in the immediate hinterland, constrict the flow of floodwater raising the flood level and causing occasional breaches in the embankments. In years of severe flood, the risk of submergence of land behind the embankments, following sudden breaches in them, is real. Dredging, as a measure to limit the flood level, has never been seriously undertaken. Some dredging operations were undertaken in the past to facilitate river navigation, but it has never been a serious enterprise, as it is generally believed that in a river with a width of 5–7 km, it is not a practical solution. It may be mentioned that there is no dearth of funds, but these are utilised for relief and rehabilitation. Flood control in Brahmaputra is still a far cry.

7.1.3.1 A Suggested Measure to Moderate Floods

Adaptation to any situation is inherent in nature. Excessive braiding, sometimes resulting in additional lateral channels, is an adaptation to excessive sediment load. The lateral stream, Kalang, taking off from Brahmaputra on its left bank at Jakhalabandha, swinging southward in a broad arc and joining Brahmaputra downstream, at a point 25 km east of Guwahati, is a facilitating device of nature to ameliorate the flow condition of Brahmaputra by partially sharing the work of the latter. Similar is the case of Kherkutia river, a channel branching off from Brahmaputra, on its right bank opposite Sibsagar, and joining Subansiri about 35–40 km further down. These loops of Brahmaputra, branching off and then rejoining, can serve as examples to be emulated in designing the flood control structures along the river.

These natural loops can be replicated by transforming Brahmaputra into an organised multi-channel stream, in which the subsidiary lateral channels, flowing parallel to Brahmaputra, like canals, would join Brahmaputra further down. A lattice of several such streams on alternate bank could perhaps ameliorate the flood situation and could also be used as irrigation canals during dry season. As for flood warnings, the mechanism has seen improvement during the last few decades, with more rain gauges in the catchment and stage and discharge monitoring stations set up on Brahmaputra and its tributaries.

7.2 Earthquakes

Though not as common and widespread as the floods, earthquakes form the second most damaging natural hazard in the North-East. In India, the Himalayan region is seismically the most active region with a high frequency of earthquakes. The North-East is an extension of the Himalayan zone of convergence of the Indian and Central Asian plate on the one hand and Indian and the Burmese plate on the other and experiences frequent tremors and earthquakes, sometimes with unprecedented severity.

The intensity of earthquakes is measured on a Richter scale, which ranges from 0 to 10. On the basis of this scale, the earthquakes are grouped into four descriptive classes:

Class of earthquake	Magnitude on Richter scale
1. Slight	<4.9
2. Moderate	5–6.9
3. Great	7–7.9
4. Very great	>8

India is divided into five zones, on the basis of the frequency and intensity of earthquakes. In this scheme the zone I is least susceptible and the zone V is the most susceptible region of the county. The North-East (all the seven states) is included in the seismic zone V. The other areas in the seismic zone V are Kutch, Andamans and a few isolated pockets in the Himalayan region. The entire Himalayan belt is in zone IV, which though seismically active has not experienced earthquakes, as severe as the North-East.

7.2.1 Earthquakes in the North-Eastern Region

The earthquakes in the region, as elsewhere, occur in the contact zone of plate boundaries or along the lines of structural weakness, like the Main Boundary Fault (MBF) or the Main Central Thrust (MCT) in the Himalayan region or along a chain of thrusts extending from Lohit district (with Mishmi fault) in the north to Manipur and further south. The plate boundaries are the most active sites of earthquakes. The most important reason for the earthquakes in the region is the collision of Indian and Tibetan plates on the north and the Indian and the Burmese plates on the eastern boundary of the region. Additional evidence comes from the focal mechanism studies. Gupta (1974) observes that: *Between Hindukush and Burma the earthquakes are scattered widely and are restricted to shallow focal depths. The focal mechanism studies indicate predominance of thrusting. In Burma the focal zone dips towards east. Under thrusting of the lithospheric block in the same direction has been indicated by the focal mechanism studies*. In the North-East, the Lohit valley with Mishmi fault is the scene of frequent tremors. Small earthquakes, not very consequential,

Table 7.5 Some of the major earthquakes that occurred in the North-East

Date	Place and region	Severity on Richter scale	Other earthquakes in the last 500 years	
10-01-1869	Cachar (Assam)	8.0	1. 1548	8. 1759
12-06-1897	Shillong plateau	8.7	2. 1598	9. 1770
08-07-1918	Assam	7.6	3. 1601	10. 1838
02-07-1930	Dhubri (Assam)	7.1	4. 1642	11. 1842
23-10-1943	Assam	7.2	5. 1660	12. 1875
15-08-1950	Assam	8.5	6. 1696	
06-08-1988	Indo-Burma border	7.2	7. 1732	

Source: Indian Meteorological Department (2001), Gazetteer of Assam State, Kamrup (1990)

are frequent in the region. 'Between 1970 and 1973, 2,500 earthquakes were recorded within a radial distance of 450 km from Shillong' (Mallick 1984). The Dhubri fault, west of Meghalaya, and the Dauki fault in its south are also the active zones of earthquakes (Table 7.5)

Besides the earthquakes mentioned above, there must have been earthquakes in earlier centuries as well of which we don't have a record. One of the very severe earthquakes of which no elaborate account is available is that of the year 1663, 'which took place during Mir Jumlah's retreat from Garhgaon, and is said to have lasted for half an hour. Another, occurring in Rudra Singh's reign did serious damage to a number of temples' (Gait reprint 2005:331).

The two most severe earthquakes, during the last hundred years, were those of 1897 and 1950. The latter one is still fresh in the memory of elderly people.

7.2.2 The Indelible Impact of 1897 Earthquake

The 1897 earthquake of Shillong surpassed in intensity all the previously recorded earthquakes. The epicentre of the earthquake was near Shillong. It had an intensity of 8.7 on the Richter scale and occurred at 05:15 P.M. on 12 June 1897 and lasted for 3 min 30 s. The aftershocks continued for several days, and on 19 June again, there was a severe shock (Chief Commissioner Assam 1897). The drainage lines were disturbed. At Guwahati, Brahmaputra rose more than 7 ft. '*The earthquake was felt over an area of 1.75 million square miles (4.53 million km*^{2}*) from Rangoon on the southeast to Kangra in the northwest, from the Himalaya to Massulipatam, and serious damage done to masonry building over an area of 145,000 sq. miles*[1]' (Allen 1905).

'The shock occurred in Guwahati a little after 5 P.M. on 12 June 1897 and was so violent that every masonry building in the town was wrecked. All the public offices

[1] Memoirs of the Geological Survey of India vol. XXIX, p 52, quoted from B C Allen (1905) Assam District Gazetteer, vol. IV, Kamrup, p 14.

Table 7.6 Shillong earthquake 1897

District	Number of deaths
Khasi, Jaintia hills	916
Sylhet	545
Kamrup	29
Garo Hills	27
Darrang	12
Goalpara	5
Nowgong	3
Cachar	3
Sibsagar	2
Total	1,542

collapsed with the exception of the post and telegraph office, the training school and the Dak bungalow…. In many parts of the district (Kamrup), fields were covered with water or deposits of sand. Ordinary drainage channels were choked, the beds of rivers were raised and the town of Barpeta, which was built on comparatively low ground, was at once submerged' (Chief Commissioner, Assam 1897).

The total loss of life, in the nine districts, was 1,542, with the largest number of casualties in Khasi and Jaintia hills. Table 7.6 presents the district wise break-up of deaths.

Another earthquake, though of far lesser intensity, had occurred in the area on 10 January 1869, causing considerable damage in Manipur, Cachar and eastern part of Barak valley.

7.2.3 The 1950 Earthquake

The earthquake occurred on 15 August 1950, during the rainy season when rivers were flooded and witnessed far greater damage by way of landslides, raising of the river beds, change of river courses, emergence of river islands and a great loss of life and property.

While the 1897 earthquake had most devastating effect in Sylhet, Cachar and Meghalaya plateau and Western Assam, the 1950 earthquake had its epicentre at Rima, beyond the headwaters of Lohit, in Tibet. The impact of the earthquake was disastrous in Eastern Assam and parts of Arunachal Pradesh. This was the greatest recorded earthquake in the history of Eastern Assam and Arunachal Pradesh. The tremors continued for a number of days.

> Hills were shaken and millions of tons of rocks rolled down the hill with explosions and agonising and deafening sound. A large cloud of dust developed over a vast area. The faces of hills pealed off not leaving a shred of vegetation and hardly any tree was visible where there were thick forests. Many parts of the land were made desolate. (Choudhury 1978:12)

Several small rivers were blocked by landslides and choked by debris as large amount of mud was thrown into rivers. When the breach of these blockages occurred severe floods took place. There were changes in the course of the rivers. Sadya was

completely destroyed and washed away by the floodwaters of Lohit. The river Brahmaputra was badly affected, especially in the upper course; a number of shoals appeared; and the river navigation came to a grinding halt. Even today, Brahmaputra is not an effective waterway as it used to be before 1950.

7.3 Landslides

Landslides are a phenomenon of the rainy mountainous areas of the world. Structure, no doubt, plays a part. A concurrence of the dip slope with the general topographic slope is the most facilitating factor. In areas of asymmetrical valleys, the gentler valley sides coinciding with the dip slopes are more vulnerable to landslides. The lithologic character of rocks is equally important. Rocks, like shale with parallel bedding planes, are far more susceptible to sliding. The structure is helped by rainfall and its infiltration creating lubricating surfaces that accelerate landslides. In case of thick overlying weathered mantle or loose earth material perched on slopes, the angle of repose is critical, beyond which the weathered mantle cannot remain perched and slides down. This depends on the composition and texture of the weathered material. The role of vegetation is important as the roots of vegetation work as a binding agent to prevent the weathered rocks from sliding. All these factors are helped by external as well internal agents. Excessive rain in a terrain with high infiltration capacity promotes landslides. But the most potent factor is 'seismic tremor'. The frequent seismic tremors in the North-East provide the trigger effect. With the tremors, the delicately balanced rock or weathered material comes down as landslides.

Anthropogenic factors are a cause for increased frequency of landslides. Human interference works in multiple ways, deforestation, conversion of sloping land into agricultural fields and cutting of hillsides for road building or other constructional purposes.

North-East is notorious for occurrence of frequent landslides, large and small. Since the area is seismically active, frequent tremors bring down the weathered mantle, perched on the slopes. Most of the landslides occur in the rainy season when the interface between the weathered mantle and the bedrocks provides the sliding surface. More often, slope failures result from cutting the hillsides for roads. Deforestation, construction of roads, coupled with incessant rains subjected to seismic tremors result in landslides.

The states most affected by landslides are Mizoram, Manipur and Arunachal Pradesh. Tiwari and his associates (1996:96) have studied a series of landslides in Mizoram, of which the two most severe are those of Bawngkawn (23°45′30″N and 92°44′E) and South Hlimen (23°41′ N and 92°43′ E), which are very significant. The Bawngkawn landslide located on the northern outskirt of Aizawl, occurring on 17 September 1994, caused disruption of traffic on Aizawl–Lunglei road for 3 days, as the entire area was covered with the debris and other clastic material sliding down from the upper segments of slope. Two factors that seem to have caused this landslide are as follows: (1) the instability of a fault in the vicinity and (2) the high

Photo 7.2 The Rengtekawn landslide, Mizoram (Photo Dr. R P Tiwari)

dipping anticlinal folds in argillaceous and arenaceous rocks of Neogene period. The tectonic instability coupled with steeply dipping fold facilitated a slide down of weathered and partially weathered rocks (Photo 7.2).

The second landslide occurred in a 300-m-long quarry having a depth of 250 m., at a village called South Hlimen (23°41′ N and 92°43′ E), about 6 km south of Aizawl, the capital of Mizoram. The landslide occurred on 9 Aug 1992. This was the most disastrous landslide that the North-East had ever witnessed, causing the death of reportedly 100 persons. The E-W-trending vertical joints intersected with E-W-trending vertical joint planes had resolved the area into huge blocks. 'With the continuous removal of toe material, the natural support for the uphill blocks was losing and thus the stability got disturbed and ultimately these were subjected to free fall along the bedding planes' (Tiwari and Kumar 1997). In this case the intersection of the bedding and joint planes had loosened the material considerably to stand any undercutting and leading to ultimate collapse. Similarly, a landslide in 1995 devastated the town of Saiha and Lawngtlai causing the death of 34 people (Awasthy 2003). In Nagaland, on the other hand, Awasthi has attributed 'high saturation of slope-forming material, with water through surface and sub-surface induction and the shaking of the ground, triggered by the 6 August 1988 earthquake, as the major causative factors' for the landslide in Mon district, near Tuli Paper Mill.

In Manipur, Okendro and Kushwaha (2008) have studied the incidence of landslides along National Highway No. 53, in a linear stretch of about 10 km, and identified

Photo 7.3 Landslide on NH-52A near Pahalwan Mod, Arunachal Pradesh (Photo Dr. (Ms.) Tage Rupa)

16 landslides, a majority of them attributed to anthropogenic causes. The underlying fact, in most cases, is the assumption that since the area lies in the Indo-Myanmar unstable zone, because of its being on the plate boundaries, a slight disturbance causes landslides on precariously balanced slopes. Most of these slides occurring along the road section are mainly due to anthropogenic activities, except a few, which are natural. 'Out of the total landslides about 44 % are anthropogenic, 31 % natural, and the remaining 25 % are compound in nature. The Churachandpur-Mao thrust, the regional fault believed to be the western boundary of the Indo-Myanmar subduction zone, is, as suggested by seismological evidences, tectonically active due to strike slip movement' (Kumar and Singh 2008). This active north–south-trending thrust, dividing Manipur in two halves, western and eastern, should be the most active zone of landslides in the state. Trilochan Singh (2003) in his traverse of Arunachal on Tezpur–Bomdila–Tawang route discovered a large number of landslides. This is the mobile zone of the North-East, with steep slopes and heavy rain, where a little tremor causes immediate landslides.

Most studies of the landslides, in the North-East region, show a roadside location. In such a situation, slope failure is the obvious triggering point for landslides. This concentration of landslides on the roadsides raises the question – whether the landslides occur more frequently on the roadsides or that this reflects the choice of investigators who prefer traversing largely along the roads for reasons of easy movement (Photo 7.3). Whatever the reason, landslides are a menace for the region and preventive measures need to be taken. The task of addressing this problem is undertaken by the Geological Survey of India (GSI) who is fully committed to introduce preventive measures, wherever necessary.

7.3.1 Protection Against Natural Hazards

In case of floods, advance warning is an effective way. To effect this, a number of rain gauges in different areas and gauge and discharge stations have been increased in the Brahmaputra basin to enable the administration to have advance warning about the impending danger of flood.

As for the earthquakes, they cannot be predicted, yet to understand where and how frequent are the tremors, more seismographs have been of late installed. In the 1980s, five more were operated by IMD at Shillong, Tura, Agartala, Imphal and Lekhapani (in Mishmi Hills). Now more seismographs have been installed in Arunachal Pradesh and Nagaland. This should, if at all, help understand the possibility of earthquakes in certain areas better. And for landslides, the cooperation of people is necessary to avoid unhealthy practices of land use.

References

Allen BC (1905) Assam district gazetteer, vol IV, p 14 quoted from Oldham RD (1898) Report on the great earthquake of 12th June 1897. Memoirs GSI 29:52

Awasthy AK (2003) A brief review of the investigations of landslides in North-East India. In: Husain Z (ed) Environmental issues in North-East India. Regency Publications, New Delhi, pp 3–10, published for NECSSR. Shillong

Chief Commissioner of Assam (1897) Report on the earthquake of June 12, 1897. Submitted to the Secretary, Government of India, 14 Aug 1897, p 4

Choudhury DS (1978) Gazetteer of India, Arunachal Pradesh, Lohit district, p 12

Gait EA (1905-reprint-2005) A history of Assam. LBS Publications, Guwahati, p 331

Goswami DC (1998) Fluvial regime and flood hydrology of the Brahmaputra river, Assam. In: Kale VS (ed) Flood studies in India, vol 41. GSI Memoir, Bangalore, pp 53–75

Goswami DC (2007) Flood forecasting in the Brahmaputra River, India, a case study. Documents. http://www.southasianfloods.org/document/ftb/index.html. Accessed 9 June 2007

Government of Assam (1990) Gazetteer of Assam State. Government of Assam, Kamrup, p 32

Gupta KK (1974) Some seismological observations and tectonics from Hindukush to Burma region. Himal Geol 4(pt.1):465–480

Hazarika BB (1990) Gazetteer of India, Assam State, Kamrup district. Government of Assam, Guwahati

India Meteorological Department (IMD) (1981) A study in trends and periodicities of rainfall, over Brahmaputra catchment. Basin Hydrometry. Monograph no. 9:14

India Meteorological Department (IMD) (2001) Earthquakes and safety measures, p 5 (a pamphlet)

Kashyap, SG (2012) Flood of struggles. Indian Express, Guwahati, July 1, 2012

Kumar A, Singh B (2008) Measurements of active deformation by installation of 3D fault deformeter in Manipur. Indian Landslides 1(1):37–39

Mallick LK (1984) Seismological set-up of Northeast India. In: Tripathi RS (ed) Resource potential of Northeast India, vol II. Meghalaya Science Society, Shillong, pp 7–21

Okendro M, Kushwaha RAS (2008) Landslide incidences along part of NH 53, between Noney and Nungba, Manipur. Indian Landslides 1(1):41–44, National Institute of Infotech Management (NIIM), Shillong

Parua PK (2003) Flood management in Ganga-Brahmaputra-Meghna basin: some aspects of regional co-operation. Civil Engineering Today 2003:68–75, ASCE-IS, Calcutta

Revenue Department, Government of Assam. http://www.dhemaji.nic.in/flood/flood_history.htm. pp 1–2

Sarma JN (2005) Fluvial process and morphology of the Brahmaputra River in Assam, India. Geomorphology 70:226–256

Singh T (2003) Geo-environmental hazards vis-à-vis restless Arunachal Pradesh. In: Husain Z (ed) Environmental issues of North-East India. Regency Publications, New Delhi, pp 11–20, published for NECSSR, Shillong

Tiwari RP, Kumar S (1997) South Hlimen landslide in Mizoram – a pointer. ENVIS Bull Himal Ecol Dev 5(2):12–13

Tiwari RP, Sharma BL, Singh B (1996) Geotechnical appraisal of Bawngkawn Landslide, Aizawl, Mizoram. In: Proceedings of the international conference on disaster and mitigation, Madras, pp 125–131

Chapter 8
The Resource Endowment of North-East India

Abstract Land, water, forests and minerals are the concrete non-human resources of the region, of which forests are discussed in an independent chapter. Of the total area of North-East India, over 63 % is mountainous, another 8 % exists as plateau and only 29 % of the region's area can be classified as plains, suitable for cultivation or other human activities requiring flat terrain. The Brahmaputra plain, forming 21.4 % of the area of the North-Eastern territory, is the main agricultural land of the region. The Cachar plain in Barak basin, together with west Tripura and much smaller flat surfaces like Pasighat–Roing–Namsai plain and Imphal valley, contributes another 6–7 % to the total availability of good agricultural land. The scope for an exclusively agriculture-based economic development is limited. The mountains, with a thin population, are sites for horticulture and tourism. The region has 24 billion cubic metre of utilisable surface water, which forms 3.47 % of the total utilisable water of India. Though the region receives over 17 % of the total volume of rainfall in the country, the proportion of utilisable water is far less because of terrain condition. North-East India has heavy rainfall and abundant surface flow, but there is no avenue for its utilisation, and much of the discharge is drained into the sea. The only important utilisation is in the generation of hydroelectric power by harnessing the relief energy in the mountainous terrain of Arunachal Pradesh.

The important minerals of the region include natural gas, petroleum and coal, though there are other minerals, some of them, like uranium, very precious. The oil and gas fields of North-East India are a part of a larger system of Tertiary rocks that extend from North-East of Assam through Bangladesh to the islands off the Arakan coast, a distance of over 1,200 km. A proven gas field in Tripura supports a mega thermal power generating unit. The oilfields of Assam occur in Tinsukia, Dibrugarh, Sibsagar and Jorhat districts, producing about half a million tons of crude every year. The coal in the region, unlike the Peninsular India coal, comes mainly from Tertiary formations, viz. Eocene and Oligocene beds. Coal is exploited in Assam as well as in Meghalaya.

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8.1 Introduction

Humankind's existence on earth has always depended upon environment and environmental resources, with varied climate, vegetation, animal life, soils and minerals. Environment in a specific area could be harsh and restrictive or generous, to which man has adopted himself, harnessed its resources, tried to understand the laws of nature and assume greater control over it. In the process, it has been possible for humankind to interfere with nature, modify it to suit their requirements and develop contemporary civilisation. But, despite all the progress made in science and technology, environment retains the basic life support system of humankind. The air, the water, the plant, the animal world and the soils and minerals are essential support elements in the survival and growth of humankind.

Nature's storehouse contains what are generally known as natural resources, derived exclusively from the earth and its environment. These environmental resources are usually divided into abiotic and biotic resources. Air, land, water and minerals are placed into a category of abiotic resources, whereas flora and fauna of a region are known as biotic resources. Thus, a country or a community has, at its disposal, certain land, water, forest and mineral resources, which it exploits. And, the richness of a community depends, among other things, upon the amount and variety of these resources it possesses and the way these are harnessed.

8.2 Land

Of the natural resources, the ones that are of primary importance to humanity include land, water, flora, fauna and minerals. Land with varying degree of suitability for human occupation covers the entire non-oceanic area of the earth, but the situation in different part of the globe is not alike, and land suitability for various economic and cultural activities varies from one region to the other.

Though required for most human activities, the occupation of land has always been primarily for dwellings and then for agriculture and other economic activities. In pre-industrial era, agricultural productivity of land determined its value and attracted people because of the livelihood support it offered. In the process, the fertile alluvial plains of the world with high agricultural productivity became the regions of great human agglomeration. Agricultural surplus in these fertile plains gave rise to some of the early civilisations of the world. Even today the importance of such regions is not diminished, though, after the emergence of secondary and tertiary economic activities, human clusters could be formed even in areas which are agriculturally not very productive.

There is no human activity where land is not the basic commodity, may it be industry, transport, trade, recreation or even simple administration. But the land required for agriculture is far in excess of other occupations. This is the reason that land is always linked to agriculture.

Table 8.1 The major terrain conditions of the North-East

Type of terrain	Area in km^2	Percentage of the area of the N.E. region	States and area included
Mountainous	165,241	63.03	Much of Arunachal Pradesh, Nagaland, Manipur, Mizoram part of Tripura, Sikkim
Plateaux	21,532	8.21	Meghalaya and isolated plateau like interfluves in upper parts of Arunachal rivers
Plains	75,406	28.76	All plains of North-East India
(a) Brahmaputra plain	56,195	21.43	
(b) Cachar plain (Barak Basin)	6,922	2.64	
(c) Pasighat, Roing Namsai plain	3,250	1.24	
(d) Tripura plain	6,300	2.40	
(e) Imphal valley plain	1,843	0.70	
(f) West Garo Brahmaputra plain	879	0.34	
Total	262,179	100.00	

Source: Worked out from maps
Note: In this calculation, area of Sikkim is included exceeding the total area of the seven states

8.2.1 Land Suitability for Different Activities

Unlike agriculture that needs fertile plains and good climate for maximising productivity, other functions like industry, trade, transport or recreation don't depend upon soil fertility. They prefer regions with a salubrious climate, scenic landscape, not a very difficult terrain and above all good accessibility and assured supplies of the necessities of life like water and nutrition besides other considerations for a specific enterprise.

The North-Eastern region of India has an unmatched variety in its landscape (Table 8.1). Very fertile plains, plateaux with undulating areas, dissected hilly terrain and forest covered areas, at different altitudes, form part of its landscape. On the basis of relief, the land of the region could be grouped into different categories like alluvial plains, high altitude plateaux, mountainous relief with dissected or partly levelled terrain and high altitude broad plateaux.

The 700 km long *Brahmaputra plain*, with the finger-like plains of the southern tributaries, Dhansiri and Kopili, following the alignments of fractures, forms the main areas of agricultural land. Added to this is the *Cachar plain*, also a part of Assam in Cachar, Hailakandi and Karimganj districts, extending to the southern border of Mizoram and Tripura. Other plains include the northern and western part of Tripura and some narrow longitudinal valleys in Mizoram. These plains lie at

an altitude below 150 m ASL and are the main granaries of the North-Eastern states. A high altitude plain, around 600 m ASL, in the Imphal valley is equally a fertile area. The western margin of Meghalaya plateau, from Tura westward right up to Brahmaputra, could be taken as an extension of Brahmaputra plain.

This 75,000 km^2 of plain area is the main agricultural land resource of the North-East, where density of population is high, the cluster of settlement dense and the transport network better developed.

8.2.2 The Plateau Land

The Meghalaya plateau, Karbi-Anglong and North Cachar Hills in Assam, ranging in altitude from 250 to 2,000 m ASL, are the areas covered with forests and are the sites of the valuable plant resource of the region. The plateau regions are important source of coal, limestone and some sensitive minerals like uranium. The most important mineral of the North-East, the petroleum, occurs in the piedmont region of bordering Naga Hills, at Digboi and Nahorkatiya and nearby area. The area also has coal deposits. The mid-altitude plateau regions, like Shillong plateau, with salubrious climate, provide hill stations and relief from the oppressive heat of the plain. Shillong was the capital of Assam for a long time, preferred by the British over Guwahati, for its cool weather and bracing climate.

Traditionally, the tribal people have been occupying mid-altitude plateaux, distant from the low-lying riverine plains. Since the earlier settlers did not depend exclusively on agriculture, fertility of soil was not so important to them. Devoid of agricultural technology, they preferred plateau regions where they practised slash and burn type of cultivation, known as *jhuming*.

8.2.3 The Mountainous Land

Occupying around two-thirds of the North-Eastern region in Arunachal Pradesh, Nagaland, much of Manipur, Mizoram and half of Tripura and Sikkim, the mountain regions have not established their utility and value to their full potential. Inhabited largely by indigenous tribes, these were classed as ‘excluded areas’ during the British rule. Even today, Arunachal, Nagaland and Mizoram come in the category of excluded areas and suffer from isolation. Why these states were classed excluded areas, barring entry to the plainsmen by what is known as ‘Inner Line’,[1] is shrouded in history. These large mountainous areas, with very

[1] *Note*: The Inner Line Regulations introduced by the British Government in 1872, to restrict the entry of people from the plains to these excluded tribal areas, exist even today and have not been repealed by the Indian Government.

low density of people, have not been able to turn the relief, climate and floral landscape of the region to their advantage.

These areas are rich in biodiversity and are a storehouse of a large variety of trees, shrubs and other medicinal plants. Some of the unique floral species like orchids grow in this region. All the peripheral mountainous states are known for their orchids. The forests of the North-East abound in animal life, and some of the rare species are found here. The most important resource of the mountainous regions, especially Arunachal Pradesh, is their potential for hydroelectricity. High rainfall and an equally high relative relief offer these regions the advantage for generating hydroelectricity.

Some of the best forest reserves of the country are in the North-East. The forest resources of the region are discussed in Chap. 9.

8.3 Water Resources

Of the elements of environment that constitute the life support system, the two most important are air and water. Unlike air, which spreads uniformly blanketing the earth with variation only in its density and quality, water is very unevenly distributed on the globe, with varying amount of precipitation. The amount of rainfall varies with little or no rainfall in dry deserts to heavy rainfall in the equatorial regions, which enjoy rainfall virtually all through the year. In between the two extremes, there are regions, which receive variable amount of rain depending on their location vis-à-vis the atmospheric pressure system, planetary winds and the orientation of orographic features.

In India the estimated annual precipitation including snowfall is 4,000 bcm (4,000 billion cubic metres). The North-East region of India receives roughly 700 km^3 of rain, which amounts to 17.42 % of the total rainfall received in the country. This has to be seen against the area of the region which is roughly 8 % of the area of India. As seen earlier, while discussing climate, no area in the North-East receives a rainfall below 1,500 mm. In fact, this is one region where drought is not known and floods are a common feature. According to Central Water Commission, Ganga–Brahmaputra–Meghna system contains 59 % of the total water resource potential of all river systems in the country and 40 % of the usable surface water resource.

The per capita national water availability seen in the light of population density in the country, as given by Central Water Commission, is 1,820 m^3, whereas the availability for Brahmaputra and Barak basin is 14,057 m^3. Brahmaputra and Barak together account for 7.6 % of the geographical area of the country and have 31 % of the annual water resources of the country.

No part of India receives as much rainfall as the North-East region, both, in terms of absolute amount and the per capita availability of water (Table 8.2).

Despite a heavy rainfall, enormous runoff and a high level of water resource availability, the actual utilisation of water, either by surface storage for irrigation

Table 8.2 Comparison of water resources potential in the river basins of North-East region with those of India[a]

Different parameters	India	NE regions	NE seen as % of India
Precipitation	4,000 bcm[b]	696.88 bcm	17.40
Average annual potential of rivers[c] (average annual flow)	1869.35 bcm	585.60 bcm	31.32
Per capita annual availability	1,820 m^3	14,057 m^3	

Source: Central Water Commission (1989)
[a]Calculated by the author
[b]Billion cubic metre = km^3
[c]Refers to Brahmaputra, Barak and other rivers and their tributaries

Table 8.3 Estimated utilisable water and replenishable ground water resource

Water resource	India (bcm^3)	North-East region (bcm^3)	The regional volume as compared to that of India (%)
Utilisable surface water	690.31	24.0	3.47
Replenishable ground water	432.00	29.79	6.90

Source: Central Ground Water Board, India (1996)

and hydroelectric power or for any other purpose, is very low (Table 8.3). The usable surface and ground water are, in fact, very low.

The low usability of water resources in the North-East despite high potential is ascribed to relief conditions, mountainous terrain and absence of large plains except the narrow Brahmaputra and Barak plains. There is also a terrain constraint on storage projects. The voluminous discharge of Brahmaputra, during the monsoons and even during the non-rainy season, goes unutilised. There is no dam or surface water storage in Brahmaputra, except a few minor hydroelectric projects in the tributaries of this mighty river. There are, however, a large number of proposed hydroelectric projects, and only a few are under execution. Presently the focus is on Lower Subansiri Hydroelectric project, which is under execution, though facing resistance from the people of downstream areas who perceive the project as detrimental to their livelihood.

The whole episode of non-utilisation of Brahmaputra waters has to be seen in the light of the physiography of the Assam plain, occupying a width of about 70 km and having a saucer-like appearance, rising gradually from the stream on either side with an abrupt junction with the piedmont heights. Any dam to span the large width of Brahmaputra, which is more than 5 km in its middle portion, between Dibrugarh and Guwahati, is bound to submerge a large part of the plain. The possibility is that half of the Brahmaputra plain may get submerged in water. Thus what additional benefit the state would get, by way of irrigation from a reservoir, would be more than offset by the loss of fertile land because of submergence. Even a dam upstream, near Pasighat, where Brahmaputra debouches from the mountainous terrain in Arunachal Pradesh, on to the plain, may not prove very effective as an irrigation project. The

Table 8.4 State-wise storage capacity in the North-East (bcm[3]) (2000)

States	Completed projects	Projects under construction	Total	Projects under consideration	Percentage of live storage of the whole country	Live capacity per million persons
Arunachal	–	–	–	45.50	–	–
Assam	–	1.05	1.05	1.02	0.42	0.047
Manipur	0.40	0.12	0.52	16.32	0.21	0.283
Meghalaya	0.70	–	0.70	0.51	0.28	0.394
Mizoram	–	–	–	–	–	–
Nagaland	–	1.22	1.22	–	0.49	1.009
Tripura	0.31	–	0.31	–	0.12	0.112
Total for North-East	1.41	2.39	3.80		1.52	

Source: Central Water Commission (2000)

irrigation canals parallel to the river on either bank would take away a lot of land, besides the land submerged under reservoir. A narrow canal taken from an upstream reservoir and running along the foot of the hills on either side of Brahmaputra may prove useful, but how useful these canals would be is yet to be determined. Besides the technical feasibility of such a canal could be another aspect to be examined.

The most plausible way of harnessing these rivers appears to be the generation of hydroelectric power in their upper courses, wherever the relief and the runoff the rivers permit such projects.

8.3.1 The Prospect of Surface Storage

The existing surface storage taking into account all the states of the North-East amounts to 1.09 bcm[3]. Besides, there are others at different stages of planning and implementation.

What is evident is that the total storage capacity developed so far on the North-East region accounts for 1.52 % of the storage of the country (Table 8.4). The main beneficiaries are Assam, Nagaland, Meghalaya and Manipur. The largest reservoir so far developed is on Dayang river in Wokha district in Nagaland. The existing storage in Assam occurs at Kopili river, a tributary of Brahmaputra. In Manipur, it is the Loktak project, which provides both irrigation and hydroelectricity. In Meghalaya, the Umiam project just north of Shillong and Kyrdemkulai project holds surface storages. In Tripura, besides Gumti, Maharani has water storage for generation of hydroelectric power. Major reservoirs in the North-East region are associated with hydroelectric power, the largest of them being Ranganadi project, a tributary of the river Subansiri. Dayung in Nagaland is already mentioned. Many large projects, notably, lower Subansiri, are under execution.

Table 8.5 Ground water potential of the North-Eastern states (km^3/year) (1996)

States	2 Total replenishable ground water reservoir	3 Provision for domestic industrial other uses	4 Available for irrigation	5 Net draft	6 Balance ground water potential available for exploitation	7 Level of ground water development in per cent 5/4*100
Arunachal	1.44	0.22	1.22	0.0	1.22	–
Assam	24.72	3.71	21.01	0.94	20.07	4.48
Manipur	3.15	0.47	2.68	Negligible	2.68	Negligible
Meghalaya	0.54	0.08	0.48	0.02	0.44	Negligible
Mizoram	Not assessed	–	–	–	–	–
Nagaland	0.72	0.11	0.62	Negligible	0.62	Negligible
Tripura	0.66	0.10	0.56	0.19	0.38	33.93
Total for N.E. (excluding Mizoram)						
(a) Absolute	(a) 31.23	4.69	26.55	1.15	25.41	4.33
(b) As % of India	(b) 7.23	6.61	7.35	0.99	10.30	–
Total for India	431.89	70.93	360.95	115.17	245.79	31.92

Source: Central Ground Board, Ground Water Statistics (1996), quoted from Central Water Commission of India (2000), table 1.28, p. 65

8.3.2 The Ground Water Potential in the North-Eastern States

Though largely depending on rainfall, the ground water potential in the North-Eastern states is comparatively small when compared with the region's surface water resources (Table 8.5).

8.3.3 Anomaly in Ground Water Availability

Despite more than 17 % of the total precipitation of the country received in the North-East and almost one-third (31.92 %) of the stream flow, the North-East region is relatively poorly endowed in replenishable ground water resource.

This anomalous phenomenon is theoretically explained by intensity of rainfall; infiltration capacity of the soil; the terrain condition, particularly the slope; and the drainage channels and their discharge characteristics. The intensity of rainfall in most part of the North-East is high; forced by orography, the rainfall is often copious. Since the entire North-East is mountainous, dissected and has youthful relief and steep slopes, there is hardly any surface retention, and the rainfall rapidly finds its way into the streams through strong surface runoff. Except the long and narrow alluvial plain of Brahmaputra, there is no flat surface to permit prolonged infiltration of rainwater. The plateau of Meghalaya, or the mountainous region of Mizoram, Manipur and Nagaland, has fewer aquifers. And wherever aquifers exist in the

mountainous areas, they are part of a dipping stratum allowing the water to flow out through seepage. The most rainy part of the North-East, the Meghalaya plateau, is underlain by crystalline rocks with some sedimentary patches on the margins of the plateau to the south and southwest, hardly enough to retain much ground water. Secondly, southern part of Meghalaya, the area of heaviest rainfall area, overlooks the high fault scarp, and the heavy rainfall quickly flows down the scarp, either in small rivulets or filters over the scarp through subterranean flow.

The plain of Brahmaputra, down Pasighat, has a deep sedimentary deposit, varying in thickness from 1,500 to 5,000 m, and ranging in age from Oligocene to Pliocene, a sequence overlain by Quaternary alluvium, which is, at places, quite thick. This linear belt of Brahmaputra valley with a variable width averaging about 65–70 km is the main source of ground water in Assam. Other alluvial belts include the Cachar plain of Barak and the small basin of Imphal valley around Imphal, which hold enough replenishable ground water.

The state of utilisable water availability is also reflected in the irrigation potential of the region. The entire region has an irrigation potential just over a million hectare, in which Assam has 970,000 ha, Manipur 135,000 ha and Tripura 100,000 ha all adding to a little over million hectares or 10,000 km^2 of arable land.

8.4 Mineral Resources of the Region

Like water, flora and fauna, North-East region is rich in fuel resources, coal, petroleum and natural gas. Besides, a number of other minerals, both in commercially exploitable and in non-exploitable quantities, are found in the states of the North-East (Fig. 8.1).

8.4.1 Fuel Resources

The most important of the fuel resources is the production of petroleum, which has, as a result of its forward linkage, led to the establishment of four petroleum refineries and a number of other industries based on petroleum.

8.4.1.1 Petroleum

The oil and gas fields of North-East India are a part of a larger system of Tertiary rocks that extend from 'North-East of Assam through eastern Bengal to the islands off the Arakan coast, a distance of 800 miles. It is roughly parallel to the oil belt of Central Burma, but on the opposite site of Arakan Yoma and its mountainous extension to the north' (Brown 1936). The existence of petroleum in Assam was first discovered in 1828, but no serious effort was made to exploit this resource. In 1866,

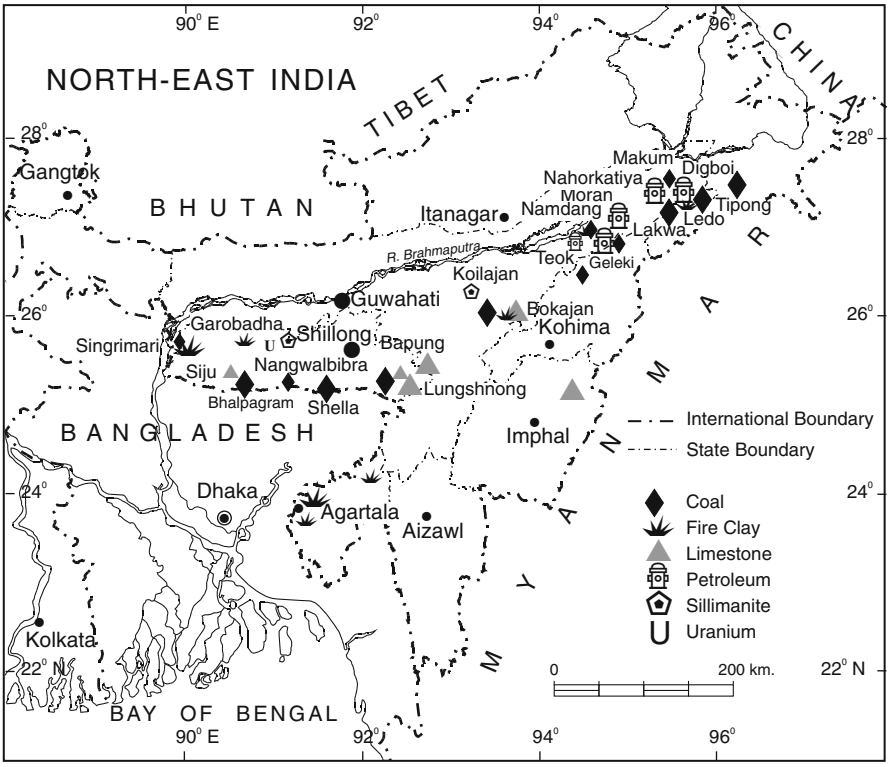

Fig. 8.1 Distribution of mineral resources, including petroleum, in North-East India

the first exploratory well was drilled in Nahorpung, a few kilometres southeast of Nahorkatiya. It was just 7 years after the famous Drake well was drilled in the USA, by Col. William Drake in 1859 in Pennsylvania, USA, marking the beginning of petroleum industry. The drilling of the well near Nahorkatiya in 1866 was just the beginning of exploration. Commercially exploitable oil was discovered in Digboi in 1890, leading to some short-lived petroleum production at Makum (now called Margherita). In 1901 another oil source was found in Surma valley near Badarpur. To process the crude produced in Makum, a small refinery was erected in Makum in 1893, which was subsequently moved to Digboi in 1901. With increased production of crude oil, the refining capacity of Digboi refinery was enlarged and the refinery was upgraded and modified in stages. Badarpur, the smaller oilfield, produced oil for only a short period and was abandoned in 1933.

Thus, till the 1950s of the last century, the production of petroleum from the Makum and Digboi fields remained virtually stationary. The change of management from Assam Oil to Burma Oil Company in 1921 increased the production marginally, and the output remained close to 184,00–187,000 gallons or 836,625–850,282 litres per day until the 1950s of last century.

Table 8.6 Distribution of oilfields in the North-East

(A) Digboi	In Tinsukia district	
(B) 1. Nahorkatiya	In Dibrugarh district	This extended oilfield, an area of 1,321 km^2, is leased to Oil India and operated by them
2. Moran		
3. Hoogrijan		
4. Rudranagar		These are recent oilfields developed by Oil and Natural Gas Commission
5. Lakwa	In Sibsagar district	
6. Teok	In Jorhat district	
7. Geleki	In Sibsagar district	

New Discoveries and the Extension of Oilfields

The major breakthrough in oil exploration occurred with the discovery of oil and gas in Nahorkatiya in Dibrugarh district, Assam, in 1953. With the addition of a number of oilfields, the known reserve of petroleum in the area has increased. Besides, modern technology has assisted in extracting oil from greater depths. The deepest well in Nahorkatiya has a depth of 4,000 m (3970.68 m) depth. The oilfields, which include Nahorkatiya and Moran and their extension into Hoogrijan, have an area of 1321.8 km^2. All these older wells are operated by Oil India Ltd.

The Oil and Natural Gas Commission has explored some more oilfields. These are at Rudrasagar, Lakwa, Teok and Geleki, lying between Jorhat and Golaghat. At present, both Oil India Ltd. and Oil and Natural Gas Commission operate in the area. The oilfields are distributed as in (Table 8.6):

Of these, the most important field is at Lakwa with an estimated reserve of 45 million tons.

Reserve and Production

With ever increasing area under exploration, the present reserve in this belt of North-East Assam stood at 148 million tons of crude oil and 159 billion m^3 of natural gas. The production of crude in Assam oilfield is around five million tons, of which a little of over three million is exploited by Oil India Ltd. (OIL) and about two million tons by Oil and Natural Gas Commission (ONGC). The oil reserve of Nahorkatiya and Moran fields together adds up to 48.87 million tons.

Mode of Occurrence

Almost all the crude and natural gas occurs in the Tertiary sediments. Initially oil was sought in the *Barails* (Oligocene formation), but it was progressively recognised that oil and gas are likely to occur in both older and younger sediments and in the overlapping zones.

Table 8.7 Oilfields in Assam

Geological period	Formation	Major fields
Mio-Pliocene	Girujan	Kharsang, Kumchai, Dirok
Miocene	Tipam	Hapjan, Digboi, Geleki, Charali
Oligocene	Barail	Nahorkatiya, Lakwa, Lakhmari, Rudrasagar, Demulgaon, Sonari, Amguri, Hapjan, Shalmari, Kusijan, Laiplinggaon, Geleki
Mid–Upper Eocene	Kopili	Geleki
Lower Eocene	Lakdang–Therria	Dikom, Kathaloni, Baghjan, Panidihing, Tamulikhat, Tengakhat
Archaean	Fractured basement	Borhola–Champang

Source: Directorate General of Hydrocarbons, Ministry of Petroleum & Natural Gas, Govt. of India

'For fields in the Assam valley alluvial area, the shales within the Paleocene-Eocene, and Barail coal-shale sequence have been regarded as the most likely source rocks and their 'kitchen' as the deeper part of the basin, now covered by the zone of Schuppen' (Das Gupta and Biswas 2000). The accumulation of oil tended to be in the younger formation towards the basin centre and in older formations towards the margin of the basin. Thus, more hydrocarbons were found in *Tipams*. At Lakwa, ONGC's largest field has 80 % of its oil in Tipams. The oldest Tertiary geological formation, Eocene, also carries oil, in thin but highly permeable sandstone, at the depth of 4.2 km (Table 8.7).

8.4.1.2 Description of Some Major Oilfields

Digboi Oilfield – Crude oil at Digboi occurs in 24 different oil-sand horizons within a stratigraphic thickness of 1,000 m of Tipam sandstone. Digboi crude is of mixed paraffin asphalt base with a fair proportion of cyclic hydrocarbon.

Nahorkatiya Oilfield – This oilfield covers Nahorkatiya Hugrijan area in Dihing valley. Oil occurs in this field in five main oil-producing sand horizons within a thick stratigraphic unit of Barail rocks, struck at a depth of 3,000–4,000 m. Large reserve of gas is found in Nahorkatiya in association with oil.

Lakwa Oilfield – Discovered in 1954, the field lies 20 km south-southwest of Moran. Oil occurs in several thick sand horizons, within the Tipam and Barail group of rocks.

Geleki Oilfield – About 25 km southeast of Lakwa, this well was discovered later. The production in this field started in 1974.

Rudrasagar Oilfield – Located 5 km southwest of Sibsagar and about 40 km southwest of Moran, this field was discovered in 1954 by Oil India. Later drilling by Oil and Natural Gas Commission located the oil horizon at a depth of 3,817 m.

Table 8.8 Production of crude oil (000 tons) in the North-East region

Year	Arunachal Pradesh	Assam/Nagaland
1990–1991	43	5,076
1995–1996	31	5,044
2001–2002	69	5,096
2002–2003	74	4,659
2003–2004	77	4,502

Source: Economics & Statistics Division, Ministry of Petroleum and Natural Gas, Govt. of India

Large reserves of gas are found in association with oil in Nahorkatiya field.

The production of crude oil in Assam fields on the border of Assam and Nagaland has progressively declined in the last 10 years, though there is a slight increase in the production of crude from Arunachal Pradesh (Table 8.8).

There are four oil refineries in the North-Eastern region, all lying in Assam. These are Digboi, Numaligarh, Noonmati (near Guwahati) and Bongaigaon. A fuller account of these refineries will be found in Chap. 18 on industries.

Natural Gas

Natural gas, consisting chiefly of methane with smaller amounts of hydrocarbon, is usually associated with crude oil. It exerts considerable propulsive pressure on the overlying formations to emerge on the top. The most important gas field in Assam is related to Nahorkatiya.

8.4.1.3 Coal

The description of coalfields, including their association with specific geological formation, is largely based on the *Geology of Assam* by Das Gupta and Biswas (2000).

The four states of North-East India, which have coal deposits that are being presently exploited, are Assam, Meghalaya, Nagaland and Arunachal Pradesh. The Assam coalfield also enters marginally in Nagaland, though the latter does not have much coal. The coal in this part of the country, unlike the major coalfields of peninsular India, is found largely in Tertiary formations. The Permian (Gondwana) coal, though present, has a very limited scope for exploitation. The three categories of coal according to their age of their origin are:

1. Permian (Gondwana) coal
2. Eocene coal
3. Oligocene coal

Much of the coal found in the region is sub-bituminous non-cooking type. Tertiary coals are also high in sulphur and low in ash content, unlike Gondwana coal, which has a high ash content.

The two important coalfields, which together produce 98 % of the coal in Assam, are as follows: (1) Makum, producing 83 % of coal in Assam, and (2) Dilli-Jaipur, producing another 15 %. The former field lies around 8 km east of Tinsukia, and the latter in Dibrugarh district, close to Tirap border of Arunachal Pradesh. The bulk of the coal mined here comes from Oligocene rocks and is associated with basal sandstone overlying the pre-Cambrian basement. Such coal in Assam is also found in Karbi-Anglong district in the following places:

Koilajan
Sheelvetta
Khumbaman
Longloi
Daigrung river bed

Makum Coalfield

The commonly known *Makum field* has a large area extending over Margherita–Ledo–Tipang Pam belt, though Makum itself is miles away from the area. This belt extends over a distance of 30 km, in a 5 km width, and has four principal mines:

1. Namdang on the western end
2. Bargolai in the central part
3. Ledo in the central part
4. Tipong on the eastern end

Of the five workable seams in Makum field, the major ones are 6–18 m thick. The 18 m thick seam forms the base of Tilak Parbat. The composition of the coal of Makum field is:

Moisture – 2–9 %
Ash – 0.8–8.4 %
V. M. – 38–51 % (volatile material)
F. C. – 42–62 %
Sulphur – 1–4 %
Caloric value – 12,500–15,000 BTU

The Makum field has a reserve of 260 million tons.

Dilli-Jaipur Coalfield

This is a much smaller field occurring southwest of Makum coalfield. It is a narrow 23 km long and half kilometre wide belt, where the coal occurs at variable depth from surface to seams occurring at a depth of 300 m. There are two horizons of coal in this field separated by a barren zone of 100 m. The upper horizon is 90 m thick and contains thin seams of 1 m thickness. The lower horizon is 35 m thick and contains four coal seams. The bottom seam has a thickness of 7.5–12 m.

Table 8.9 Coal reserves of the North-East states (reserves in million tons)

States	Proved	Indicated	Inferred	Total
Arunachal Pradesh	31.23	11.04	47.96	90.23
Assam	259.37	26.83	34.01	320.21
Meghalaya	117.83	40.89	300.71	459.43
Nagaland	3.43	1.35	15.16	19.94
India	82,395.95	89,500.82	39,696.85	211,593.61

Source: Das Gupta and Biswas (2000:128)

This field has a reserve of 54 million tons. The total coal reserve of different states of the North-East region is given in Table 8.9:

Coal in Meghalaya

The coal in Meghalaya occurs on the margin of the plateau where Tertiary rocks are seen. Occurring largely in Eocene rocks, there are more than a dozen isolated areas where coal occurs. The coal reserves of Meghalaya are estimated at 460 million tons. Over 50,000 tons of coal is exploited every year. These coalfields can be grouped into three areal units, viz. (1) South Garo coalfields which include Siju and Baghmara–Rongra coalfields, (2) Cherrapunji and neighbouring coalfields on the southern margin of East and West Khasi Hill districts and (3) Jaintia coalfields in the vicinity of Bapung, east of Jowai. Besides, there are a number of smaller coalfields. Most of these coalfields are still at the prospecting level.

The main coalfields of Meghalaya, which have a reserve of more than one million tons of coal, are as follows:

1. Siju coalfield. Lying in South Garo Hill district. Not too extensive a field, it has thick seams sometimes as much as 2 m and has a possible reserve of 25 million tons of coal.
2. Pendengru–Balphakram coalfield, a continuation of Siju coalfield. This coalfield extends from Baghmara, on the southern margin of the Meghalaya plateau eastward, and has a potential reserve of over 100 million tons of coal.
3. Darrangiri coalfields. Straddling both the West Khasi and South Garo Hills, the field has an estimated reserve of over 120 million tons of coal. Though easy to exploit, the coal has not yet been exploited. Of this sparsely spread area, the west Darrangiri field is more promising with a potential of over 60 million tons.
4. Langrin coalfield. Spreading west of Jadukata river, in West Khasi Hills district, with the seam thickness of around a metre, the field has a good reserve that is estimated at 100 million tons.
5. Bapung coalfield. Located in Jawai district of Meghalaya on Silchar–Shillong road, this coalfield, with a reserve of 35 million tons, is under exploitation. There is also some coal deposit in the vicinity of Bapung coalfield, in Sutunga area. Despite a small reserve, the coal in this area is being heavily exploited.

Many of these coalfields are not easily accessible, and some have very thin seams to be exploited economically. The most well-known coalfield that is being actively exploited in Meghalaya is the Bapung coalfield of Jawai district, about 60 km south-east of Shillong.

8.4.2 Other Mineral Resources

8.4.2.1 Limestone

The North-East region of India, marked by a large Tertiary basin, carries limestone deposits in many areas. Most of these limestone deposits belong to what is known as Sylhet limestone, the upper part of Shella formation, all belonging to the Jaintia group of rocks of Eocene period. Good quality, cement grade, limestone occurs in Karbi-Anglong and North Cachar hills. Koilajan in Karbi-Anglong, about 20 km north-west of Dimapur, has a reserve of 30 million tons. The latter feeds the factory, run by Cement Corporation of India at Bokajan, about 16 km North-East of Dimapur, on Dhansiri river. Bokajan is located on the North-East Railway line about 16 km North-East of Dimapur. Smaller deposits occur at Sheelvetta and Sainilangso (Fig. 8.1).

Limestone also occurs in North Cachar Hills, by the side of Garampani–Lanka road. East of Garampani, there is an exposure of 60 m thick band of limestone. The reserve is estimated at 900 million tons. This limestone is a generally silicious and contains 40–50 % of CaO.

In Meghalaya, a metre thick band of limestone skirts the southern slope of Tura range in Garo Hills district. The upper 875 m thickness of this deposit constitutes a massive good quality limestone source, suitable for cement plants. The Garo Hills limestone can be grouped as follows:

1. Darrang–Era–Aning Deposit – Situated near Nangalbibra, the limestone beds extend from Darrang–Era–Aning in the east to Pathargethim in the west. The upper bed has a thickness of 15 m with 40–50 % CaO.
2. The Tura range area mentioned earlier is known as Siju deposits, in the Simsang river valley. Lying north of Baghmara, this good quality limestone deposit, with a CaO content of over 50 %, carries a reserve of over 200 million tons.

Limestone also occurs in Jaintia district of Meghalaya. Known as Lumshnong–Mynkre deposit, the limestone beds are scattered in an area of over 70 km^2. The deposit represents the Shella limestone of Jaintia group of rocks of Eocene period. The three successive beds observed at different locations are as follows:

Upper (Prang) Limestone	90 m thick
Middle (Umlatdoh) Limestone	40 m thick
Lower (Lakadong) Limestone	60 m thick

The reserves are huge, though their quality is uncertain.

8.4.2.2 Building Stones

There is no dearth of building material in the North-East region. Besides the Tertiary sandstone, which is not as massive as hard granite and granite gneiss which are available in western Assam from the hills, representing the outliers of Meghalaya plateau. Karbi-Anglong and North Cachar hills are other areas in Assam, which abound in building stones. The Meghalaya plateau is a source of all kinds of building material, granite, granite gneiss, quartzite and the last one from the famous Shillong rocks, besides the ornamental Khasi greenstones. Sandstones are found all over Dishang and Jaintia group of rocks besides the Barails, which also provide sandstone.

In practice, however, the people of Mizoram, Nagaland and even Arunachal Pradesh have traditionally depended on timber, logs, bamboos and thatching material for building their houses. Stone has emerged, if at all, as a building material in these regions, only lately. The non-use of hard stone as building material in the tribal belt can be attributed largely to easy availability of bamboo, timber and thatching material, but no less to the ignorance of the use of masonry, till the beginning of the last century. The North-East region abounds in bamboo and timber, and different ethnic groups, like the Nagas, the Mizos, the Khasis and the Garos, have perfected the technique of erecting and maintaining thatched houses, using timber and bamboo.

Use of timber, bamboo and thatching material could be also interpreted in the light of frequent seismic disturbances, which cause minimal damage to these thatched houses, and if damaged, can be easily repaired and re-erected. It is only lately that the knowledge of advanced technology of building stone houses has created demand not only for stones but even for ornamental stones. Stones are also quarried for export to neighbouring countries, especially Bangladesh.

The most important building material is granite, followed by sandstone, quartzite and limestone. Granite, with slight variation in composition, also turns into ornamental stone, like mica-free pink-coloured granite or epidiorite known as black granite. In Assam, granite, including ornamental granite, is found in Kamrup, Goalpara, Dhubri, Bongaigaon, Nagaon and Karbi-Anglong. These are often intrusive granites in a mass of gneiss, emerging after denudation as inselbergs. The following locations are specifically known for different types of ornamental stones (Das Gupta and Biswas 2000).

(A) *Pink Granite* – Pink granite occurs at following localities:

1. Mahamaya Hill, Centre Baar and Bellughat, Karbi-Anglong district
2. Dudkhuri Hill near Boko, Kamrup district
3. Kukrakala near Jakhalabanda and Burapahar, Nagaon district
4. Dolmera Hill, Kokrajhar district
5. Phopanga Hill and Tukreswari Hill, Goalpara district
6. Dudhnath Hill and Tokrabandha Hill, Dhubri district

(B) *Black Granite*

1. Kakira Hill, Deoli Hill and Khalamari, Goalpara district
2. Barjuri, Thoiganga, Buriganga and Thanajuri, Nagaon district

(C) *Purple Granite*

1. Near Boko and near Guwahati city, Kamrup district
2. Dudnath, Tokrabandha and Chandradinga hill, Dhubri district
3. Near Silonijan, Karbi-Anglong district
4. Jakhalabanda, Nagaon district

Granite rocks in Assam have promising business potential as ornamental stone. The pink granite of Mahamaya Hill and Dudkhuri Hill could be profitably mined, if stone cutting and polishing industry is developed on a large scale. The estimated reserve of black granite of Goalpara and Nagaon districts is about 1 billion m^3.

8.4.2.3 Fire Clay

They are commonly associated with the coal seams of Tertiary period. In the Namdang–Ledo area, fire clay occurs below the coal measures. In Karbi-Anglong, fire clay occurs in Koilajan colliery mentioned earlier. This has a fairly high content of aluminium with a chemical composition as given below. It is suitable for firebricks.

SiO_2	42.75 %
Al_2O_3	34.75 %
Fe_2O_3	3.20 %
TiO_2	1.24 %
Loss on ignition	15.20 %

Kaolin

Like many other mineral, kaolin also occurs in Karbi-Anglong, where it has developed as by-product of weathering of granite–gneiss. There are two places where kaolin occurs in minable quantity. The first is upper Deopani, and the second is Sheelvetta. In upper Deopani, the kaolin has a thickness of over 6 m. The mass of kaolin at Deopani has an Al_2O_3 content of 36.4 %, with around 44 % silica, and can be used for ceramic industry. Kaolin also occurs in small quantities in Meghalaya.

8.4.2.4 Sillimanite

The sillimanite deposits occur in Assam and Meghalaya. The mineral is widely used as a high refractory material or as a grog material in the manufacture of refractory.

In Meghalaya, sillimanite occurs in the granite–gneiss and also in the quartzite–mica–schist assemblage of Shillong group of rocks, near the contact of granite intrusions. The occurrence in Meghalaya is only of nominal importance and, being very small in quantity, has no economic value.

Exploitable quantity of sillimanite occurs in Karbi-Anglong district. The deposits at Chipilangso, Samelangso and Ingtigaon are economically viable. In Chipilangso, the mineral occurs as massive sillimanite or as quartz–sillimanite schist. The sillimanite deposits are grouped in three categories, viz. 90 % sillimanite, 70 % sillimanite and 40 % sillimanite, occurring in irregular patches. The mineral, though substantial in quantity, is qualitatively not so good and does not have properties for the manufacture of high-grade refractory. It could be used as grog material for the manufacture of refractory.

Though one can enumerate a large number of minerals in the North-East region, many of these are not viable for economic exploitation. The main minerals that are being exploited and used are oil, coal, limestone, kaolin clay and silica, which were described above.

References

Brown JG (1936) India's mineral wealth. OUP, Bombay

Central Ground Water Board, India (1996) Ground water statistics. Quoted from: Water and related statistics, pp 51, 52, 63, 65. Central Water Commission (2000) New Delhi

Central Water Commission (1989) Major river basins of India – an overview. Basin Planning and Management Organisation, Ministry of Water Resources, Government of India, New Delhi, p 21

Central Water Commission (CWC) (2000) Water and water related statistics, Table 1.8. Ministry of Water Resources, Govt. of India, p 23

Dagli V (ed) (1971) Natural resources in Indian economy, Series: Commerce and economic studies 7. Vora & Co Publishers, Bombay

Das Gupta AB, Biswas AK (2000) Geology of Assam. GSI, Bangalore

Directorate General of Hydrocarbons (2009–10) Assam and Arakan Basin: petroleum plays. Ministry of Petroleum and Natural Gas, Govt. of India, Noida. "http://www.dghindia.org/" www.dghindia.org

Mukherjee KN (1984) Exploration for coal with particular reference to tertiary coalfields of North-Eastern India. Rec GSI 113(pt. IV):1–14

Prasad AR (1986) Coal industry of India. Ashish Publishing House, New Delhi

Chapter 9
Natural Vegetation: Forests and Grasslands of North-East India

Abstract Of the total forest area of around 68 million hectares in India, the North-Eastern states account for over 17 million hectares, roughly one-fourth of the forest area of the country. All the states of North-East India, with the exception of Assam, have 50–80 % of their area under forests. High temperatures, combined with heavy to very heavy rains, have stimulated the growth of forests at lower levels. Even in the mountainous regions, there are heavy rains in summer, and lower temperatures during winter don't cause excessive evapotranspiration and thus limit the possibility of any moisture stress in the soil. The forests in the hilly regions, despite the destruction of forests by slash and burn cultivation, have survived and are regenerated. These forests have enormous variation in their typology and floral characteristics, ranging from tropical evergreen at lower altitude in upper Brahmaputra valley to pine forests in the Himalayas and birch–rhododendron scrub at still higher levels. *Dipterocarpus macrocarpus* (Hollong in Assamese) and *Mesua ferrea* (Nahar in Assamese) are the principal type trees of Assam valley tropical evergreen forests. In the tropical moist deciduous forests, *Shorea robusta* is the principal species with several associates like *Schima wallichii* (Makna Sal). The subtropical wet hill forests, as in Meghalaya, have several varieties of oak (*Quercus* spp.). Richness of flora because of the wet hills presents a climate condition, which combines the characteristics of tropical as well as temperate climate. At higher altitudes, mixed coniferous and coniferous forests occur followed by sub-alpine pastures, rhododendrons and scrubs at still higher altitudes.

North-East India is known for its biodiversity. It is one of the two biodiversity hotspots of India. Half the total number of floral species, known in India, occurs here, and the region forms the richest reservoir of genetic variability. An important aspect of the forests of the region is the profusion of orchids. The North-East region has 876 orchid species, which constitute 70 % of the total orchid flora of India. To preserve the biodiversity of the region, a number of biospheres, national parks and wildlife sanctuaries (2004) are established in the region.

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Plants are the earliest form of organism to colonise the earth, much before the animals and humans appeared on the scene. They are most vital for other forms of life, as they are the producers, the rest being all consumers. For millions of years, plants evolved, developed and spread over different parts of the earth. The only constraints were then, as they are today, the climo-edaphic factors. Their distribution is influenced by temperature conditions with their determinants latitude and altitude, amount, intensity and seasonal distribution of precipitation and to some extent soils. Plant exist today either as natural vegetation or cultivars. Original, though changing, distribution of natural vegetation has been grossly disturbed during the last several thousand years, following the advent of agriculture and progressively increasing conversion of land under natural vegetation into agricultural land. Increasing population meant not only more land for agriculture but even for other purposes, like industries, urban growth, growing socio-economic institutions and other infrastructures. The land under natural vegetation gradually shrank, and what we see today as natural vegetation is only the pale shadow of what once existed as a glorious mantle of vegetation, before the humans entered on the scene, and civilisations destroyed a large part of that vegetal. The higher the concentration of population in a region, the greater is the destruction of natural vegetation and its replacement by croplands and commercial plantations.

While discussing the vegetation North-East India, a simplified approach, which gives prominence to the character of the vegetation-covered land, is adopted.

The land colonised by natural vegetation is usually grouped under three categories: forests, grasslands, (savanna, grass lands and steppes) and scrubland. India is among the first ten countries, in terms of area under forests, trailing behind countries like Russia, Canada, Brazil, China, the USA and Congo. The country has around 68 million hectares (67,700,800 ha, according to Forest Survey of India 2006) of forest, accounting for 20.6 % of its geographical area. *Of the total forest area in India, one-fourth (17,331,600 ha) is confined to the seven North-Eastern states. These states, with barely 8 % of geographical area of the country, carry more than 25 % of its forest cover*.

9.1 Abundance of Forest in the North-East

No other state of India, except the island states of Lakshadweep and Andaman and Nicobar, has such a large part of its area under forest cover as North-Eastern India (Table 9.1). Assam is the only state in the North-East which has a lower percentage, though above national average, of forests than several other states, like the coastal states of Goa and Kerala and the Central Indian state of Chhattisgarh.

The controversy about the discrepancy centred on the ‘area recorded as forests’ by the State Governments and the actual forest area has been going on since the 1980s. The application of ‘remote sensing techniques through satellite images’ has produced a picture, quite different from what was normally believed earlier.

Table 9.1 Distribution of forest cover in the North-Eastern region (km^2)

States of India	Geographical area (km^2)	Recorded forests		Actual forest cover	
		Area	Percentage	Area	Percentage
Arunachal Pradesh	83,743	51,540	61.55	68,019	81.22
Assam	74,438	27,018	34.45	27,826	35.48
Manipur	22,327	17,418	78.01	17,219	77.12
Meghalaya	22,429	9,496	42.34	16,839	75.08
Mizoram	21,081	16,717	79.30	18,430	87.42
Nagaland	16,579	8,629	52.05	13,609	82.09
Sikkim	7,096	5,841	82.31	3,262	45.79
Tripura	10,486	6,293	60.01	8,093	77.18
Total for NE States	263,179	142,952	54.31	173,297	65.80
Total for India	3,287,263	774,740	23.57	678,333	20.64

Source: Forest Survey of India (2003) State of Forests Report, Dehradun

Today, according to Forest Survey of India, only 20.6 % of the geographical area of the country is under forest cover, in contrast with 25 % that was quoted officially earlier. Even, this one-fifth of the geographical area of the country (20.6 %) is not fully covered with very dense forests, which account for only 8 % of the total forest area in the country. Much of the forest cover in the country consists of moderately dense and open forests, the former accounting for 49 % and the latter for 42 % of the total forest cover of India.

9.1.1 Reasons for the Abundance of Forest Cover in North-East India

There are more positive factors that promoted the growth of forests in this region than the negative ones. The most important determinant is the rainfall and moisture regime. As seen earlier in the chapter on climate, almost all parts of the region receive more than 1,500 mm of rainfall, and most parts receive over 2,000 mm of rain. There are only small pockets like Lumding, Imphal or Lanka (Nagaon district) lying in the rain shadow of Barail range or Naga Hills which receive less than 1,500 mm of rain. Out of 140 rainfall stations, 105, i.e. 75 %, receive more than 2,000 mm rainfall and some like Cherrapunji receive even more than 10,000 mm of rains.

A fact, which is to be weighed against the amount of rainfall, is its seasonal distribution. Though 90 % rainfall is received during summer months, even the winter months receive around 10 % of rain spread intermittently over months, ensuring soil moisture and saving the trees from moisture stress. Added to the amount and distribution of rainfall is the humidity factor which is relatively high. Even in winter months, the relative humidity of places in Brahmaputra valley is around 66 % retarding excessive evapotranspiration. The evapotranspiration, in the

higher mountainous region, is much less because of lower temperatures. A moisture regime suited to forest growth in the North-Eastern region is established, firstly by heavy and better periodic distribution of rainfall because of the impact of the North-Eastern monsoon and, secondly, by low evapotranspiration because of relief, characterised by peripheral hills and mountains.

9.1.1.1 Relief, Especially Altitude

Relief, and particularly height, is not to be discounted as a factor in promoting forest growth. Altitude works in two ways, firstly by causing orographic rain and secondly by moderating moisture regime. At higher altitude, lower temperatures cause less evaporation and leave enough moisture in soil. Secondly, winter snow in higher area, besides summer rains, is a substitute for precipitation. The effect of higher altitude can be seen in the forest cover of the mid-height ranges in Arunachal Pradesh, Nagaland, Manipur and Mizoram.

Altitude, in the North-East region, has not led to a situation of perpetual snow except in small patches on the Himalayan heights of Arunachal Pradesh on Indo-Tibetan border. Elsewhere, above 4,000 m, the snowfall is seasonal and vegetation is sparse, but not altogether absent.

Many patches of forests mediate the effect of evapotranspiration by an adaptation, shedding their leaves in a phase, attaining a deciduous character. Thus, in many areas in the Brahmaputra and Barak plains, parts of Tripura and Manipur and even in the southern part of Arunachal Pradesh, deciduous forests have resulted from their adaptation to weather conditions. The trees, unlike the cultivated plants, do not exclusively depend on soil moisture and tap water from ground water sources through their deep roots. Besides, a large number of plant species, having a xerophytic character, easily survive moisture stress.

Higher rainfall with a better and less uneven monthly dispersal, good temperature conditions with insignificant area under perpetual snow, an overall higher level of humidity and absence of excess evapotranspiration at higher altitudes, which receive moderate to heavy rainfall, have resulted in a luxuriant growth of vegetation, particularly the forests, in the North-East region.

9.1.1.2 The Impact of Soils

The impact of soils in a climatic zone creates certain variants; one may call them edaphic variants. In lateritic soils, the acidity creates physiological drought, a situation where plants are unable to take nutrition because of acidity in the soils. The plants, in such a situation, become stunted. The author has not seen any extensive patch of laterite in the North-East, like what are observed in Western Ghats, Goa, Chota Nagpur plateau or Orissa. The sandy soils of the flood plains of Brahmaputra, often inundated annually, create a separate milieu.

9.1.2 Some Negative Influences on the Forest Growth of the North-East

The most significant negative factor in transforming natural forests and their growth in the North-Eastern region is the encroachment by humans. It starts with converting the forestland into agricultural land. Much of the agricultural land that supports vast population of the Ganga-Brahmaputra plain has resulted from the conversion of forests and grasslands into agricultural fields. Thus, the Brahmaputra and Barak plains, the plain of western Tripura or the agricultural land either on Meghalaya plateau or in the Manipur valley, have resulted from the destruction of forests. The conversion of forestland into agricultural land is a part of survival strategy of humanity and, as such, is not considered a harmful practice, as it is necessary for human existence.

There are, yet, other practices that have harmed the forests in the North-East region immeasurably. One such practice is shifting cultivation (slash and burn cultivation), regionally known as *jhuming*, involving burning of stretches of forests and growing a number of crops, a kind of mixed culture, after every 4 or 5 years. The *jhumias* (shifting cultivators) use indigenous methods of farming, without the use of ploughs and fertilisers. Around 400,000 ha of forests are burnt every year, and the total area that has been under shifting cultivation in the region, at one time or the other, amounts to roughly 1.5 million hectares. The large-scale destruction of forests is also attributed to the fact that considerable areas of forests are still owned by village communities or individuals in the North-Eastern states. Besides, illicit felling in the insurgency affected areas – it is generally believed – has also affected the health of the forests. In addition, gregarious flowering of bamboo either in Nagaland or in Mizoram leads to the destruction of bamboo forests.

In Barak valley, the upper Jiri reserved forests seem to suffer from encroachment by unauthorised labour colonies. The forest villages of reserved forests, originally intended to create a captive pool of labourers for forestry when labour was scarce, have become one of the major threats to forest destruction (Bora 2009). The search for cultivable land in the forested areas is pervasive. In upper Bhalukpong and Tipi area, famous for orchids, rapid transformation of natural setting and reduction of animal corridor is the result of a strong hunt for relatively flat plain area for the purpose of settlement and development (Bhagabati and Bhattacharya 2009:62). In Karbi-Anglong, one of the richest forest areas of Assam, while the dense forests have declined from 13.05 to 4.64 %, the open forests have increased from 44.68 to 47.36 %, showing clearly shrinkage in the area of dense forests (Hazarika and Saikia 2009:77).

9.1.3 Forest Data and the Controversy About It

India has one of the oldest forest departments of the world, and forest data have been traditionally maintained by forest departments of each state. In the beginning

Table 9.2 The forest data for North-East India (areas in km^2)

States	Geographical area	Recorded forest area	Percentage of geographical area	Forest area as shown by satellite	Percentage of geographical area	Discrepancy in per cent
Arunachal	83,743	51,540	61.55	67,777	80.93	+19.38
Assam	78,438	26,832	34.21	27,645	35.24	+1.03
Manipur	22,327	17,418	78.01	17,086	76.53	−1.48
Meghalaya	22,429	9,496	42.36	16,988	75.74	+33.40
Mizoram	21,081	16,717	79.30	18,686	88.63	+9.33
Nagaland	16,579	9,222	55.62	13,719	82.75	+27.12
Tripura	10,486	6,294	60.02	8,155	77.77	+17.75
Total NE region	254,083	137,519	53.90	170,054	66.66	+12.76

Source: Forest Survey of India (2003) State of Forests Report, Dehradun

of 1980s, doubts began to be expressed about the actual forest cover vis-à-vis the recorded areas of forests, published by forest departments of respective states. It was widely believed that the recorded areas of forest cover, as published and approved by the Governments of India, were, in fact, the area under the administrative control of forest departments and did not represent the actual forest cover.

The problem was addressed by the application of remote sensing and the scanning and evaluation of satellite images. The result was startling, as wide discrepancies were noticed between the recorded data provided by forest departments and those obtained from the satellite imageries. The evaluation of satellite images gave a figure of 677,088 km^2 as the actual forest cover in India, that is, 20.6 % of the area of the country, in contrast to 774,740 km^2 of recorded area of forest, which is 23.57 % of the geographical area of India. Similar was the situation is the situation of forest data in North-East India. For the seven states (Arunachal, Assam, Manipur, Meghalaya, Mizoram and Tripura) of the North-Eastern region, the total recorded forest area, in revenue as well as in forest records, is 137,519 km^2, i.e. 53.9 % of the geographical area of the region. In contrast, the evaluation of satellite data gives a figure of 170,054 km^2 as the actual forest area, which, in terms of percentage, is 66.66 % of the area of the region, showing 12.76 % higher area under forests (Table 9.2).

The two sets of data provided by the Government of India, to say the least, are misleading. While for India, as a whole, the satellite data estimate the area under forests to be 23.57 % of the geographical area of the country, a figure about 3 % lower than the traditionally recorded area of the forests; for the North-Eastern region it is just the reverse. The satellite data interpretation gives a much higher area under forests than the recorded area. Those familiar with the North-East are inclined to think that the satellites have been misinterpreted, and the areas under forests in the North-Eastern states are often overestimated. The Forest Survey of India has shielded itself by adding certain new categories of forests, like open forests (Table 9.3). This leaves enough ground to juggle with the reality. It is quite likely that area under shifting cultivation, left fallow, has been, partly, if not fully, included

Table 9.3 Distribution of forest in North-East India

States	Geographical area	Forest cover 2005 (assessment), area in km^2					
		Very dense forest	Moderately dense forest	Open forest	Total forest area of the states	Percentage of the geographical area of the states	Percentage of the forest in the state of the total forested area of the North-East
Arunachal Pradesh	83,743	14,411	37,977	15,389	67,777	80.93	39.10
		(21.26)	(56.0)	(22.7)	(100)		
Assam	78,438	1,444	11,387	14,814	27,645	35.24	15.95
		(5.2)	(41.2)	(53.6)	(100)		
Manipur	22,317	923	5,541	10,622	17,086	76.53	9.85
		(5.4)	(32.43)	(62.16)	(100)		
Meghalaya	22,429	338	6,808	9,842	16,988	75.74	9.80
		(1.98)	(40.10)	(57.93)	(100)		
Mizoram	21,081	133	6,173	12,378	18,686	88.83	10.78
		(0.72)	(33.04)	(66.24)	(100)		
Nagaland	16,579	236	5,602	7,881	13,719	82.75	7.91
		(1.72)	(40.83)	(57.44)	(100)		
Tripura	10,579	61	4,969	3,125	8,155	77.77	4.70
		(0.75)	(61.00)	(38.32)	(100)		
Sikkim	7,096	498	1,912	852	3,262	45.97	1.88
		(15.26)	(58.60)	(26.14)	(100)		
Total North-East region	263,179	18,044	80,369	74,903	173,316	65.85	99.97
		(10.41)	(46.37)	(43.21)	(100)		
India	3,287,263	54.569	332,647	289,872	677,088	20.06 % of India	
Forest in North-East region as percentage of India	8.00	33.06	24.17	25.84	25.59		

Source: Forest Survey of India (2005)

in the category of forests. Similarly, the tribal communities often practise a kind of farming in which many trees are left intact to be utilised as timber. Images of such fields could be interpreted as moderately dense forests.

The forest data need to be reconciled and brought to represent the actual picture on the ground. An overestimate could also result from the enthusiastic environment lobby, which would like to exercise some kind of indirect moral pressure on the tribal communities, not to destroy the forests but to preserve them. It also provides an instrument to the forest departments and official agencies to claim more land as forests.

In the context of India, though the North-Eastern states have only one quarter of the total forested area of the country, its share of the 'very dense forest' is one-third (33.06 %). Assam, with more than one-third of the area devoted to agriculture to support a dense population, has the lowest percentage (35.24 %) of its area under forest. All other states have 70–80 % of their area under forest.

9.2 Distribution of Forests in the North-Eastern States

With the exception of Assam and Tripura, most states of North-East India have 75–85 % of their territory occupied by forests. In absolute terms, however, Arunachal Pradesh, the largest state of the North-East, has also the largest area under forests, accounting for almost 40 % of the total forest area of the North-East, followed by other states, viz. Assam, Mizoram, Manipur, Meghalaya, Nagaland, Tripura and Sikkim (Fig. 9.1).

The sequential order of the states based on the total area under forests is not identical to the one emerging after taking into consideration the proportion of land under forest in each state. This is clear from Table 9.4.

Thus, there are three states, viz. Mizoram, Nagaland and Arunachal Pradesh, with more than 80 % of their land under forest. Another three states, viz. Tripura Manipur and Meghalaya, have 70–80 % of their area under forest, and the last two states, Sikkim and Assam, have less than 50 % of their area under forest.

Most states of the North-East, leaving Assam, are mountainous, with a low density of population. There are no large alluvial plains. Sparsely settled tribal communities in these states have been depending on shifting cultivation, and not on sedentary agriculture. Absence of settled cultivation in the hills is explained as much by tradition as by the relief of the area. Though recent efforts by the Central and State Governments, to develop terraces for annual cultivation, have slightly changed the situation, much of the land still remains under forest and is subjected to burning year after year for shifting cultivation. Horticulture, as a replacement for shifting cultivation, is now being promoted.

The two states, which have some plain areas, are Assam and Tripura. The former consists mostly of districts in Brahmaputra and Barak valleys where large-scale settled agriculture is practised. The mountainous area in Assam is confined to Karbi-Anglong and North Cachar hills. Roughly, 70 % of the area of Tripura, in the North-Eastern and eastern part, is mountainous, and about a fourth of the southeastern part of the state is an alluvial plain, the rice bowl of the state.

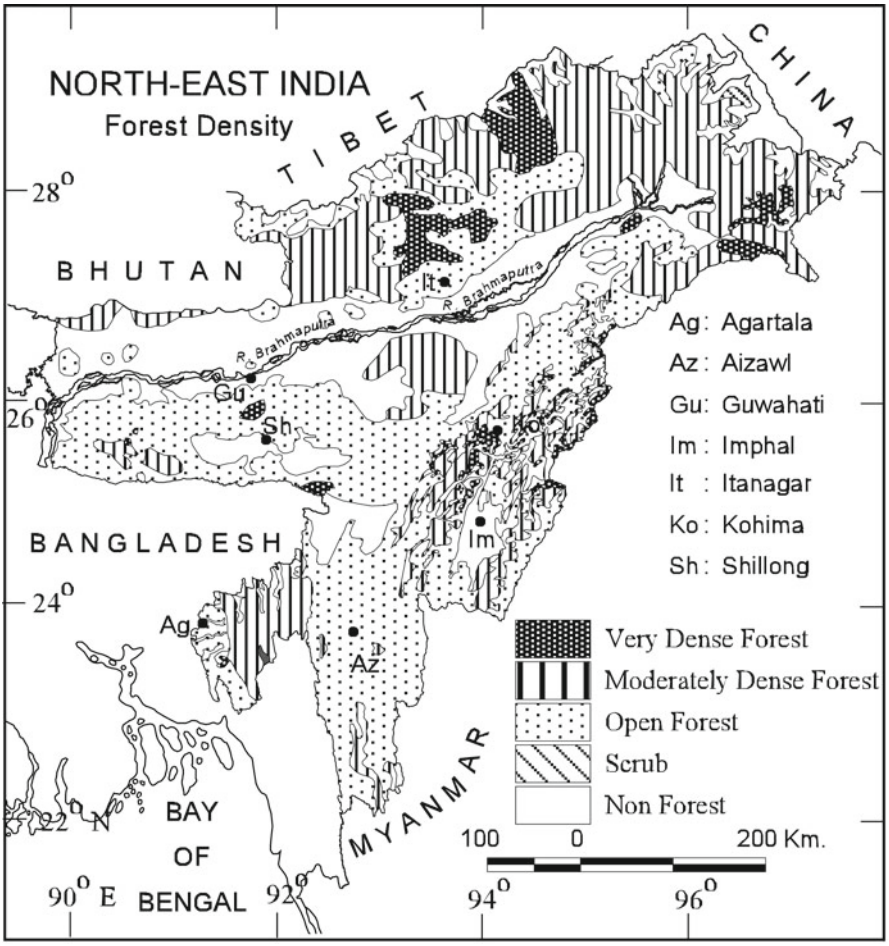

Fig. 9.1 Distribution of forests with variable density: very dense, moderately dense, open forests and scrub land (Modified after Forest Survey of India, Dehradun (2005) State of the Forest Report)

Table 9.4 Ranking of North-East Indian states according to total area under forests and proportion of land under forest

States	Area under forests (km^2)	Descending order number	Percentage of land under forest in %	Descending order number
Arunachal Pradesh	67,777	1	80.93	3
Assam	27,645	2	35.24	8
Manipur	17,086	3	76.53	5
Meghalaya	16,988	5	75.74	6
Mizoram	18,686	4	88.63	1
Nagaland	13,719	6	82.75	2
Tripura	8,155	7	77.77	4
Sikkim	3,262	8	45.91	7

Source: Forest Survey of India (2005:13)

In fact, one can divide the whole of North-Eastern region into two broad vegetation classes: (1) the mountainous areas covered with forests and (2) the plains occupied by agricultural land. The mountainous areas, wherever these are, are covered with forests of different density and a variable percentage of canopy cover. Most of these forests are moderately dense forests. The plain areas, with a few exceptions, like the Duar region of Kokrajhar district, have agricultural land. Looking individually at each state, on the basis of district-wise record of each district, the rugged highest parts of the mountainous terrain are the only areas still preserving very dense forest cover. Arunachal Pradesh is the only state that has over 20 % of its area covered with dense forests.

9.2.1 State-Wise Distribution and Quality of Forests

9.2.1.1 Arunachal Pradesh

The state has virtually all kinds of forests, starting from tropical evergreen at lower levels, north of Brahmaputra, to alpine forests in the vicinity of Indo-Tibetan border. Over 20 % of its forests are very dense and 56 % are moderately dense; the remaining are open forests. Some of the best patches of forest in the state occur in West Kameng district, west of Kameng (Bhairali) river, stretching from the Tarai area north of Assam-Arunachal border, rising into Siwaliks and further north to middle Himalayas as far as Tawang. Travelling from Bhalukpong, a few kilometres north of Assam border to Bomdila–Dirang and further north, beyond the Se La pass (4,249 m ASL), up to Tawang, the interfluves carry dense patches of forests. On the eastern side of Arunachal, Changlang and Tirap have large areas of very dense forests. Most parts of the state have at least half of their forests under moderately dense category (Fig. 9.2). All the open forests are the remnants of shifting cultivation and account for about one-fourth of the forested area (Photos 9.1 and 9.2).

9.2.1.2 Forests in Assam

The state has 27,645 km^2 or 35 % of the area of the state under forests. Much of the forested area in Assam is confined to four or five hilly or partially hilly districts, of which Karbi-Anglong and North Cachar hills district (lately changed into Dima Hasao) account for roughly 45 % of the total forest area and 50 % of the very dense forest area of the state. The districts listed in Table 9.5 account for much of the good forests of Assam.

Besides these, the districts of Karimganj and Hailakandi have, respectively, 46.05 and 58.85 % of their area, under forest cover; but being small districts, these don't add much to the state's forest resources.

Karbi-Anglong also leads in the quality of forests and accounts for 40 % of the very dense forests of the state. Besides Karbi-Anglong and North Cachar hills, a

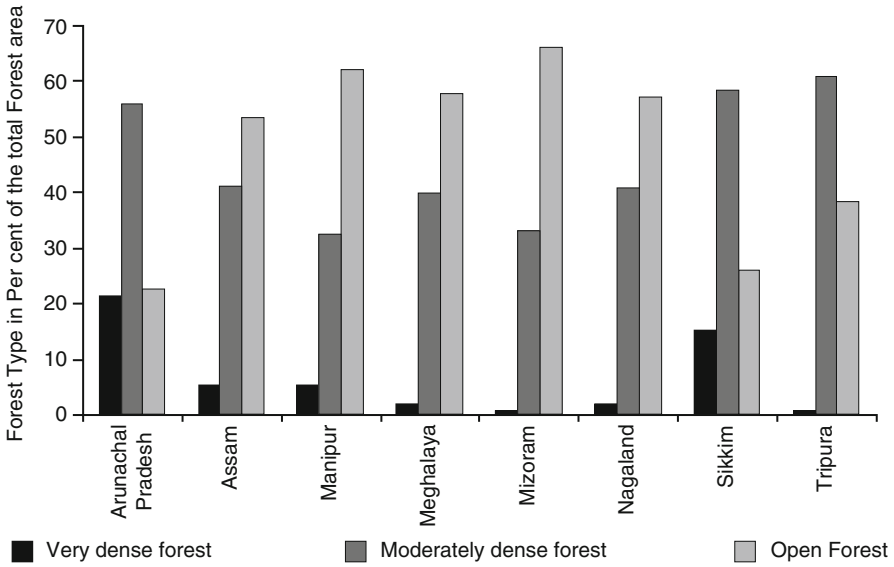

Fig. 9.2 Proportion of different types of forests (very dense, dense and moderately dense) in different states of North-East India

Photo 9.1 V-shaped valley in the Himalayas; some pine trees appear in the forest

very important district in the state is Kokrajhar, known not for the total area of its forests, which add up to not more than one-third of the district area, but for some well-preserved very high-density forests, next only to Karbi-Anglong district. This forest is sheltered in the triangular area enclosed by the river Sankosh in the west,

Photo 9.2 Thinning of vegetation in the Higher Himalayas

Table 9.5 Forest area in some selected districts of Assam (in km^2)

Districts	Area of forest area	Percentage of the area of the district	Percentage of the forest area of the total forest area of the state
Karbi-Anglong	7,994	76.61	28.90
North Cachar Hills	4,269	87.34	15.40
Cachar	2,225	58.77	8.00
Kamrup	1,435	33.03	5.19
Tinsukia	1,532	40.42	5.54
Kokrajhar	1,132	37.33	4.13

Source: Directorate of Economics & Statistics (2006:74–80)

Phipsoo Wildlife Sanctuary on the border of Bhutan in the north, and extends as far south as Kochugaon on the National Highway no. 31C. In the North-East corner of Assam, Tinsukia has over 100 km^2 of dense forests. The forests in other parts are often degraded and are virtually open.

9.2.1.3 Manipur Forests

Manipur has 17,086 km^2 or 76.5 % of its area under forests. The forests are confined to the mountainous fringe areas of the state. About 90 % of the area of the state, surrounding the Manipur plain, is mountainous and hilly, and only 10 % is covered by south-central plain with its centre at Imphal. The Imphal plain consisting of Imphal West, Imphal East, Bishnupur and Thoubal has virtually no forests. Imphal East has around 30 % of its land under open and degraded forest on the eastern hill

slopes. But the area surrounding Imphal, particularly south of Imphal district, represented by Bishnupur and Thoubal, has no forests, and the land is intensively cultivated with a high density of villages.

The largest forest area, about one-fourth of the total forest area of the state, occurs in Churachandpur district, occupying the southwestern hilly area of Manipur, on the Myanmar–Mizoram border. The southeastern mountainous part of the state, forming Chandel district adjacent to Churachandpur, has also a thick cover of forests. Both these districts, Churachandpur and Chandel, with 35 % of the area of the state have 40 % of its forests. The north-western, northern and North-Eastern mountainous areas of the state occupied by Tamenglong, Senapati and Ukhrul – the three districts – have some good forests. In fact, very dense forests, with good quality timber and other trees, are confined to Tamenglong and Senapati districts. The forests of southwest and north-eastern part, Churachandpur and Ukhrul districts, are open and much degraded because of excessive shifting cultivation.

The mountainous Tamenglong and Senapati districts carry *semi-evergreen*, *montane wet temperate* and even *subtropical pine* forests, which occur in Ukhrul district.

9.2.1.4 Meghalaya Forests

The Meghalaya plateau, varying in altitude from 200 m ASL in the west and north-western part to 1,960 m ASL in the vicinity of Shillong, receives high to very high rainfall that allows the growth of vegetation all through the year. The state has 16,988 km^2 or 75 % of its area under forest, though most of the forests are open, degraded and at best moderately dense. Dense forests hardly account for 2 % of the forest area of the state. The open forests occupy 9,706 km^2 area, which is 59 % of the total area of forests in the state.

The areas of the state, which are visibly better forested, are Ri Bhoi, southern part of Jaintia Hills, southeastern part of West Garo Hills and southern part of East Garo and South Garo hills districts. Reserved forests constitute only 11.71 % of the area of the state, and large part of the forest area is unclassed which is controlled and administered by Jaintia Hills, Khasi Hills and Garo Hills Autonomous District Councils. The category called ‘very dense forests’ is very limited in Meghalaya, confined to only two patches, one of 128 km^2 in Ri Bhoi and another of 100 km^2 in Jaintia Hills (Photo 9.3). In Cherrapunji area, the forests are now confined to valley slopes, and the upper spurs are dominated by grass, especially *Arundinella-panicum sataria* (Kumar et al. 2008).

The forests of Meghalaya are rich in biodiversity having rare species of orchids and medicinal plants. The state is known for its sacred groves, in Khasi and Jaintia hills districts, representing a climax vegetation. In character, the forests of Meghalaya have a large range varying from *wet evergreen* forests to *semi-evergreen*, *tropical moist deciduous* and *pine* forests represented by a unique species called *Pinus khasya*.

Besides two national parks and three wildlife sanctuaries (2004), the state also has a biosphere reserve around Nokrek peak (1,412 m ASL) in West Garo Hill district. Patches of scrubland are also seen in East and West Khasi Hills.

Photo 9.3 Forest on the southern slope of Meghalaya plateau, road between Silchar and Jaintia

9.2.1.5 Forests of Mizoram

Mizoram has 18,684 km^2, or 88 % of the state territory, under forests, the highest percentage in the entire North-East region. These forests are, however, not in good shape and are badly degraded. Good quality forests are rare. Very dense forests account for less than 17 % of forest area in the state, and more than two-thirds fall in open category. Lunglei district in the south and Champhai district in the east, on the Myanmar border, have better stocks of forests, followed by Aizawl and Mamit districts. Like other hilly states, Mizoram has only 4.4 % of land under crops and the rest is under fallow or covered with forests. In contrast to other states, it has a much larger percentage of reserved forests (47.31 %), or even protected forests (21.34 %), giving hope of a regeneration and the appearance of richer forests in the future. Only 30 % of the forest area is managed by the local village communities.

The state, with a predominantly mountainous relief, is covered with forests of all types, like *tropical evergreen*, *tropical semi-evergreen* and even *montane pine* forests. Together, these occupy 88 % of the state's area. The remaining 12 % is either occupied by regular rice cultivation, shifting cultivation or other cultural elements like settlement and roads. The densest forests of the state occur in the north-central part of Champhai, southern Saiha, central eastern part of Lawngtlai and the central north–south ridge in Mamit district. Eastern part of Aizawl district is also rich in forests.

A special feature of the forest of Mizoram is the predominance of bamboos that dominate the forests and have precedence over trees in the line of succession (Photo 9.4). Bamboos are the first to colonise the areas abandoned after shifting cultivation. They are hardy and grow rapidly. This is also the feature of forests in Tripura. A unique feature of bamboo forests is their flowering, which occurs every

Photo 9.4 Bamboo, as bamboo brakes dominate the secondary forests of Mizoram and other hill states. Bamboo constitutes an important element in the rural landscape of the North-East

40–50 years. Their flowering, almost in a single phase, leads to their destruction and multiplication of rodent population. The latter causes tremendous destruction of crops, leading to famine. This unprecedented calamity, witnessed every 50 years, is known as *Mautam* in Mizoram.

9.2.1.6 Nagaland

Separated from Brahmaputra plain by a fault scarp, Nagaland is a highland with the exception of a small area in Dhansiri valley covering Dimapur district. With an annual rainfall of over 1,600 mm in most parts, the state has 13,719 km^2 or 82.75 % of its area under forests. This appears to be an overestimate, as the recorded forests show an area of 9,222 km^2 under forests. It is not plausible to reject the record data altogether. A divergence of 27 % has to be reconciled with actual field survey. Of the districts, Dimapur district is least forested with 53.56 % of forest cover, while Wokha, one of the western districts of the state, facing Brahmaputra plain, has a forest cover of 89 %, the largest in the state.

In terms of quality of forests, the eastern districts of Tuensang and Phek are more important, as besides having over 80 % of the land under forest cover, these districts have some very dense forests in the eastern part of Tuensang district on Myanmar border. The higher mountain reaches in Phek district, some of it on Manipur border, and the southern part of Kohima district, coinciding with the area surrounding Zaphu peak, has some splendid forests. The low-level forests in Dimapur–Chumukedima area bordering Karbi-Anglong are well stocked with good quality timber with a moist deciduous character. On the higher ranges, in the eastern part of the state are

found *wet temperate forests* and even *pine forests*. The *tropical evergreen* patches are confined to the valleys bordering Assam.

Like Manipur and Mizoram, the forests of Nagaland are also degraded largely because of shifting cultivation. The recorded forests in the state, including reserved, protected and unclassed, add up to 55.62 % of the area of the state of which 94 % is unclassed. This shows not only a poor state of preservation but also a complete lack of organised effort towards preservation of forests. Both unrecorded and unclassed forests bear the brunt of *jhuming* and are completely degraded. The Joint Forest Management Committee of the State Government and the people manage just about 20,000 ha (200 km^2) of forests. This is only 1 % of the area of the state. The rest are yet to be brought under proper management.

The state has one national park and three wildlife sanctuaries occupying a total area of 22,236 ha, forming 1.34 % of the area of the state.

9.2.1.7 Tripura

Tripura has 8,155 km^2 or 77.7 % its area under forests. The state shows considerable divergence between the area recorded as forests and the actual forest cover, as revealed by satellite data. While the recorded forest area of Tripura (6,294 km^2) is 60 % of the geographical area of the state, the actual forest cover, based on satellite data of November–December 2004, is 8,155 km^2, which is 77.7 % of the geographical area of the state. Of this, very dense forests account for only 61 km^2 (0.75 %), moderately dense forests cover 4,969 km^2 (61 %) and open forests occupy 3,125 km^2 (38.22 %) of land.

The state has two distinct physical divisions, mountainous terrain on the east and plains on the west. The former occupies 70 % of the land and the latter around 30 %, largely confined to the western part of the state, on Bangladesh border. The western part receives heavy monsoon rainfall, often over 2,000 mm (Agartala 2,178 mm), as well as some winter rain. The state has very favourable conditions for forest growth, and the princely state of Hill Tippera (earlier name of Tripura) was traditionally recognised as a state with rich forests and a large elephant population. Human interference and increasing pressure of population, especially the conversion of forestland into agricultural fields, have brought about the depletion of forests in the area.

Much of the moderately dense forests are confined to Dhalai district, in the mid-eastern part of the state, and South Tripura. Western Tripura, a largely agricultural district, is characterised by a landscape that can be resolved into two components, the *tillas* or higher mounds and the *lungas* or the lowlands. The *tillas*, the low hillock-like prominences in the landscape, are covered with forests and plantations, and the *lungas* are the flat agricultural lowlands. But this agricultural land is largely confined to the western third of the state.

The forests of Tripura are typified as *tropical moist deciduous* and *subtropical broadleaved hill forests*. There are huge areas of bamboo brakes. Bamboo areas are also the favourite sites for *jhuming* or shifting cultivation. This is also partly because of the fact that the land, once left fallow after two successive years of

shifting cultivation, is rapidly colonised by bamboos, which the *jhumias* (shifting cultivators) slash and burn in the next cycle. Tripura, unlike other hilly states of the North-East, has over 4,000 km^2 of reserved forests which are under the strict supervision of the State Government.

9.2.2 Classification and Comparison of Forests

Forests in India were classified ever since the forest conservation as a practice was introduced in India during the colonial period, on the basis of ownership and control of forests. The usual classification grouped the forests into three categories: reserved, protected and unclassified. This also reflected the state of preservation and the need for protection and plantation in specific areas. This was different from the concept of typology, introduced by foresters subsequently on the basis of the climatic zone under which these forests occurred and their floristic character, the evergreen composition or deciduous character, the height and density of trees in an association as well as the character of leaves and phenology. To add specificity to this typology, terrain conditions like 'montane', 'riverine' and 'alpine' were added.

Thus, the classification was based on the composition and character of forests. There was, however, no statistical basis for typology. Often two or more typologies overlapped, and the presentation of the areal spread of each type was at best approximate. In contrast, the administrative classification was based on actual record of ownership, and the forest departments knew exactly the forest areas under their control and the tracts they had marked as 'reserved' or 'protected' or what they had left as unclassified.

A comparison of the total forest area, as obtained from the two sources, does not agree (see Tables 9.2 and 9.3). In the present text, the figures obtained from the Forest Survey, based on satellite imageries, are used. The State Governments rely on their traditional records for planning and management and use the figures published by Forest Survey only to ensure that the total area of forests as recorded in successive years by the survey does not decline.

9.3 Typology of Forests

That there is a large variety of forests in India was well recognised by foresters and silviculturists in India. The country of a continental proportion harboured not only contrasting relief conditions, from the low coastal and alluvial plains to the Himalayan heights, but was also known for a rich variety in vegetation that ranged from tropical evergreen to high range pastures, stunted trees and mosses. Because of the latitudinal extent and altitudinal range, the growth of tropical, subtropical, warm and cold temperate climate plants is witnessed in the subcontinent. The North-East of India, with heights ranging from 50 m ASL in Brahmaputra valley to 7,000 m ASL in Arunachal

Himalayas, is a floral microcosm of India. It has enormous floristic variety and richness that attracted plant explorers like Francis Kingdon Ward, who spent months, and even years, exploring India's North-East, botanically.

One of the early silviculturists, who attempted a geographical–floral regionalisation of the country in 1930, was R. S. Troupe of Indian Forest Service and subsequently a professor of forestry at Oxford and a fellow of St. John's College.

Troupe divided India and Burma into 12 regions. These were as follows: (1) Western Himalayan, (2) Eastern Himalayan, (3) Trans-Indus, (4) Northwest Dry region, (5) Gangetic plain, (6) West coast, (7) Central Indus, (8) Deccan and Carnatic, (9) Assam, (10) Chittagong and Arakan, (11) Burma and (12) Andaman. The North-Eastern part of the country was covered by two of his regions, i.e. Eastern Himalayan and Assam.

His Eastern Himalayan region and Assam together add up to the present North-East region of India. A few years later, Champion (1936) published *A Preliminary Survey of the Forest Types of India and Burma*. His classification comprised seven broad classes, subdivided into 12 groups and further subdivided into a number of subgroups. Champion based his classification primarily on broad climatic zones following latitudinal definition like 'tropical', 'subtropical' and 'temperate', specifying the regions like southern and northern and adding relief features like 'montane' and 'alpine'. Champion's scheme was criticised among others by Davy (1939) and Puri (1960). Their main objection was that Champion neglected local conditions and even ignored edaphic control. Puri modified and rearranged Champion's classification. In view of the criticism, the original typology of forests as presented by Champion in 1936 was revised in 1968, by Champion and Seth, in what is known as *A Revised Survey of Forest Types in India*.

According to the revised typology, the forests of North-Eastern India were divided into 16 broad types with 50 subtypes. Many of these subtypes were specified by qualifying them with the region of their occurrence like 'upper Assam valley tropical evergreen forests' or 'Cachar tropical evergreen forests' or 'Khasi subtropical hill forests'. Some of the subtypes were also qualified by the dominant species in a specific association. In this context, one may add the contribution of Rajkhowa (1961b), a silviculturist of Assam, who contributed substantially to the revised classification with the knowledge, gained from field observations and working plans that were available to him. Champion and Seth (1968) while revising the earlier *Survey* took into considerations Rajkhowa's publication and even adopted it wherever necessary.

The following typology is largely based in Champion and Seth with some additions of Troupe and Rajkhowa.

9.3.1 Forest Types in the North-East Region

The broad types of forests in North-Eastern India are as follows:

1. Tropical wet evergreen forests
2. Tropical semi-evergreen forests

3. Moist forests
4. Swamp forests
5. Khair-Sissoo forests (Acacia catechu and Dalbergia sissoo)
6. Subtropical hill forests and savanna
7. Pine forests
8. East Himalayan wet temperate forests
9. East Himalayan moist temperate forests
10. East Himalayan dry temperate coniferous forests
11. East Himalayan sub-alpine birch–fir forests
12. Birch–rhododendron scrub
13. Dry alpine scrub

Some of the important types of vegetation is described here.

9.3.1.1 Tropical Evergreen Forests

Tropical evergreen forests in the North-Eastern region are confined to Assam valley including upper Assam and Cachar with cane and bamboo brakes.

In Assam valley and the alluvial plains, these forests occur in areas with 2,500–3,500 mm of rains and are found on high alluvial deposits near the foothills of Darrang, Lakhimpur and eastern part of Dibrugarh and Tinsukia districts as well as on the southern bank of Brahmaputra and the undulating older alluvium of Dihang river. These extend further into North-East covering the lower region of Tirap, Lohit and Dibang valley districts and the lower Siwalik region of the Himalayas. Besides, the evergreen forests occur also on the lower hills and hill slopes of Cachar Hills district and the southern part of Khasi and Jaintia hills. In Tripura, these forests occur on isolated hills called *tillas* but more extensively in East and Southeast Tripura especially Dhalai district in Tonglarai valley and Kanchanpur area of Tripura. The lower region of Naga and Patkai hills also carry tropical evergreen forests. Most of the evergreen forests have only three dry months, from November to January. The mean monthly temperature does not exceed 32 °C and mean minimum for January is close to 10 °C. Though locally these areas are subtropical, they have always a favourable moisture regime. Rajkhowa (1961a, b) has divided the evergreen forests into (1) sub-montane evergreen and (2) tropical evergreen. In the former category, he includes Khasi and Jaintia hills and North Cachar Hills, and in the latter category, he includes different types of evergreen forests based on floristics.

Floristics of Evergreen Forests

Besides some of the common trees that occur in most parts, individual formations characterise specific regions.

Table 9.6 Floristic composition of upper Dihing and Jeypore reserved forests

	Upper Dihing reserve		Jeypore reserve
Floristic species	No. of trees per 100 acres	Percentage of trees	Percentage of trees
Dipterocarpus macrocarpus	1,291	42.00	34.50
Mesua ferrea	634	20.00	31.50
Shorea assamica	169	5.60	17.00
Magnoliaceae	163	5.40	4.70

Source: Rajkhowa (1961b)

Assam Valley Tropical Evergreen Forests

In the valleys, in upper parts where the land is not used for cultivation or plantation, the evergreen forests have a '*Dipterocarpus-Mesua* formation' also known in Assamese as '*Hollong–Nahar* forests'. More trees are added in this formation in order of strength. The forests contain the following species:

1. *Dipterocarpus macrocarpus* – (*Hollong* – Assamese)
2. *Mesua ferrea* – (*Nahar* – Assamese)
3. *Shorea assamica*
4. *Antigimia excelsa*
5. *Dysoxylum procerum*
6. *Artocarpus chaplasha*

In the valley, there may be other formations like *Vatica lanceaefolia – Eugenia* spp. – *Garcinia cowa*. Also, there are occasional bamboo brakes consisting of *Dendrocalamus hamiltonii*.

Upper Assam Valley

The forests in the upper part of Assam valley, though evergreen, have a different formation owing largely to altitude, lower temperature and less moisture loss and a better seasonal distribution of rainfall regime. The formation in upper Assam is commonly known as '*Kayea assamica*' formation. Here *Dipterocarp* is absent (Rajkhowa 1961a, b) as seen in Dulong Reserve. The composition in Dulong Reserve is as follows:

Kayea assamica – 68 %
Pterospermum lanceaofolium – 6.25 %
Canarium spp. – 4.3 %
Echino carpus – 3.7 %
Mesua – 3 %
Terminalia chebula – 3 %

In the higher areas of Eastern Assam and parts of Arunachal Pradesh, the formation is slightly different and can be termed *Shorea assamica – Mesua ferrea* formation or sometimes *Dipterocarpus plosus – Mesua ferrea* formation commonly known as *Hollong–Nahar* type. The latter of these two evergreen formations is represented by upper Dihing Reserve and Jeypore Reserve (Table 9.6).

The evergreen forests in Tinsukia (Assam) and Tirap (S. Arunachal Pradesh) are four-storeyed closed forests, averaging a height of 30 m with *Mesua* dominating the top storey. The second storey is at 17 m. There is frequent occurrence of *ficus* at lower heights and climbers are rare. In the foothill region of Arunachal Pradesh, the evergreen forests have a slightly different composition that is formed by *Mesua ferrea*, *Ailanthus grandis*, *Echino carpus*, *Michelia doltsopa* and *Quercus lamellosa*.

In Cachar Hills region, the evergreen forests have a composition that is exemplified by the forests Inner Line Reserve. Here the main constituent is *Palaquium* (20 %) followed by *Diospyros tapioca* (9 %) and *Mesua* (7.5 %). The cane brakes in Cachar Hills are formed of the various species of *calamus*, but particularly *Calamus tenuis*.

9.3.1.2 Tropical Semi-evergreen Forests

The semi-evergreen forests are largely evergreen, with varying proportions of deciduous trees. Usually such forests have a broken top storey and are less uniform in composition and far less imposing than the luxuriant evergreen forests. But in an overall assessment, they have very many large trees and their middle storey is dense. Trees are often characterised by buttressed trunks. Unlike evergreen forests, because of the light filtering through the opening in the top storey, there is an undergrowth of trees, and sometimes there are cane clumps. There are creepers and strangulating lianas. Such forests occur in Assam valley proper, in the sub-Himalayan light alluvial plains including Sadiya region, Diyung valley of Nagaland, Dhansiri valley of Sibsagar district and western part of Goalpara district.

Brahmaputra Valley

The floristic composition of the semi-evergreen forests is formed by *Cinnamomum* spp., *Amoora wallichii*, *Phoebe* spp., *Dysoxylum* spp. and *Syzygium* spp. On the southern bank of Brahmaputra, there is virtually no dominant species and trees such as *Castanopsis indica*, *Dysoxylum procerum*, *Stereospermum personatum* (7.8 %), *Mesua*, *Magnolia and Canarium*. All these occur in almost equal proportion.

The Sub-Himalayan Region and Western Nagaland in Diyung Valley and Dhansiri Valley

The composition of forest in these areas is represented by *Terminalia–Phoebe* association with *Terminalia myriocarpa* and *Phoebe cooperiana* as the principal trees. *Mesua ferrea*, *Dillenia indica* and *Meliosma gynocardia* are occasional trees. Several species of calamus occur.

Western Assam

In western Assam, particularly Goalpara western division, semi-evergreen forests are represented by *Syzygium–Tetrameles–Machilus* subtype. The dominant trees are as follows:

Syzygium (Eugenia)	25 %
Tetrameles	17 %
Machilus bomycina	15 %
Stereospermum personatum	4 %

High Savanna–Syzygium Parkland

This type of evergreen forests consists of low-branched trees about 3–4 m high, growing in a savanna grassland where the grasses are about 2 m high. It occurs in heavy soils in areas waterlogged during rains and burnt annually in hot weather. Such forests occur in the vicinity of *sal* forests in Brahmaputra valley. The short trees are often *Syzygium cumini*, *Emblica officinalis*, *Gmelina arborea* and *Semecarpus anacardium* besides *Glochidion assamicum*. The grass in such savanna consists of *Imperata*, the dominant grass, with *Saccharum spontaneum*, *Ophiuros* and *Vetiveria*.

Cachar and Eastern Hilly Semi-evergreen Forests

By typology, the semi-evergreen forests of this category are known as 'Cachar tropical semi-evergreen forests', but since they extend to the hilly area of Manipur and Mizoram, additional area like Eastern Hilly areas is included. Many of these forests could also be included in the category of deciduous forests as there is no sharp demarcation line between the two and they often overlap and are named subjectively by the investigator or a silviculturist.

Such forests occur in the lower slopes of Cachar Hills, in parts of Barak valley, Manipur, Mizoram Hills and the Hills of Tripura. In Cachar Hills, these semi-evergreen forests have a floristic composition marked by the following: (1) *Artocarpus chaplasha*, (2) *Dipterocarpus turbinatus*, (3) *Palaquium polyanthum*, *Eugenia* spp., *Vitex peduncularis*, *Pterospermum acerifolium*, *Melocanna bambusoides* and evergreen shrubs. In eastern Manipur, the forest is dominated by *Dipterocarpus tuberculatus*, and *Artocarpus chaplasha* is virtually absent.

The floristic composition of Manipur and Mizoram semi-evergreen forests is as follows:

Dipterocarpus turbinatus
Dipterocarpus tuberculatus
Melanorrhoea usitata
Duabanga grandiflora
Dillenia pentagyna

Lagerstroemia parviflora
Terminalia tomentosa
Gmelina arborea

Since the semi-evergreen and deciduous forests have been subjected to repeated *jhuming*, many areas have degenerated into bamboo brakes with scattered trees. The following species of bamboo thrive in these areas:

Melocanna bambusoides
Teinostachylum dulloa
Bambusa balcooa

9.3.1.3 Tropical Moist Deciduous Forests

Also known as *very moist Sal-bearing forests*, moist areas having *sal* (*Shorea robusta*) are different from the sal areas with moderate rainfall as in Madhya Pradesh. In the North-East region, areas with 2,000–5,000 mm carry these forests. Such forests are distributed on the lower slopes of the Himalayas, i.e. sub-Himalayan region of Bhabar and Tarai plains, in Garo, Khasi and Jaintia hills of Meghalaya and in Karbi-Anglong district. In Khasi Hills, these occur at altitudes ranging from 150 to 650 m, i.e. upper parts of the Khasi foothills. Sal in this area occurs in pure stands, or as a dominant element, among the mixed deciduous species, mainly on ridges.

Typical associates of sal are:

Shorea robusta **(principal tree)**

1. *Schima wallichii* (*Mukna Sal* – Assamese)
2. *Adina cordifolia* (*Haldu* – Hindi, *Bonglong*, *Raghu* – Assamese)
3. *Premna* spp.
4. *Dendrocalamus hamiltonii*

The foothill forests of Khasi Hills extend lower in Kamrup and Goalpara districts, where the floristic composition is the same as above, with some more species like *Gmelina arborea*, *Dillenia pentagyna*, *Vitex peduncularis* and *Terminalia bellerica*. In the depressions, *Dendrocalamus hamiltonii* occurs in profusion. Moist sal also occurs in western part of Assam in Goalpara division and elsewhere. Such forests also occur in lower Bhabar and Duar region.

Sometimes, the sal trees are more scattered and appear to occur in a savanna context, besides the *Imperata cylindrica* grass, other trees that occur are *Careya arborea*, *Emblica officinalis*, *Wrightia tomentosa* and *Randia*.

Eastern Hillock Forests

These are high-level riverine forests of Assam with a rainfall of about 1,500 m, where the trees experience some moisture stress during summer. These grow on light soils. The principal elements in these forests are *Terminalia myriocarpa* and *Lagerstroemia speciosa* with accounting for 40–45 % of the trees.

9.3.1.4 Sub-montane Hill: Valley Swamp Forests

Creeper Swamp Forests

Low-lying site in Brahmaputra valley at 150–200 m ASL with heavy soil in very moist and low-lying area is dominated by creeper swamp forests. These are thick impenetrable forests with trees less than 10 m high supporting a mass of creepers and are overgrown by them. These contain pockets of *Phragmites* and patches of *Cephalanthus*. The forests have the following composition:

Magnolia griffithii
Litsea spp.
Quercus listeri
Altiginia

At places these *Machilus gamblei* and *Syzygium cumini* are also found.

Tropical Seasonal Swamp Forests

Besides the creeper forests, there are seasonal swamp forests. These are usually named by silviculturists as *Altiginia–Machilus–Syzygium* forests. A typical forest of this type is *Sonebheel* forests in Cachar which carry *Barringtonia acutangula*.

Eastern Dillenia Swamp Forests

These are dense forests of medium height and are known as inundation forests, which get inundated during high floods. These occupy heavy *Khurkani* soils on flat surfaces flooded during wet season. The principal association of the species are *Dillenia–Bischofia* and *Dillenia–Mesua*.

9.3.1.5 Eastern Wet alluvial Grassland

This kind of forest is formed by treeless grassland, in areas of cut-off meanders, river islands and low alluvial sites. These occur usually in the eastern part of Assam valley. These are well flooded during monsoon with about 3-m deep water. In summer, the stiff heavy soil (*Khurkani* soil) dries out completely. With a very severe condition for tree growth, the grasses grow rather well. Such forests are also subjected to annual fire that stops the progression that could take place.

Kaziranga Sanctuary is an example of this type. The grasses usually consist of:

1. *Phragmites*
2. *Saccharum procerum*

These attain a height of 5 m or more, are very dense and provide a protection and a hiding ground to wildlife, particularly the unique one-horned rhinos and elephants.

9.3.1.6 Subtropical Broadleaved Hill Forests

These are divided into two groups:

1. East Himalayan subtropical wet hill forests
2. Khasi Hills subtropical wet hill forests

In the latter category, the hills of Manipur, Nagaland, Mizoram and Tripura are also included.

East Himalayan Subtropical Wet Hill Forests

In Arunachal Pradesh, this type could also be called *montane subtropical forests*. These occur on the lower slopes of Eastern Himalayas at a height of 1,000–2,000 m. These are evergreen forests with occasional deciduous species. The trees attain a height of 20–30 m, but seem to reach a height of 50 m. The canopy is less dense than the tropical evergreen forests. A shrubby undergrowth is always present. Grass is absent and bamboo is not seen, but climbers are numerous.

Floristics

These forests are characterised by oak and chestnut. These two species are always present with other temperate trees; they are *Alnus* (alder), *Prunus* (prune) and *Betula* (birch). *Schima terstroemiaceae* is very characteristic throughout its range, and extends downward to the tropical forests. Occasional *Dipterocarp* or *Shorea* may be seen but are rare. *Pinus* are either absent or confined to drier areas or well-drained ridges.

In Manipur these broadleaved forests occur between 800 and 1,100 m altitude. The floristics here are defined by *Quercus–Laurus–Schima–hylium* combination. D. B. Deb has found the following composition in the Langool Reserve. The floristic composition is as follows:

Lithocarpus spicatus, *Quercus vercus* (*fenestrata*), *Quercus serrata*, *Castanopsis*, *Schima*, *Cinnamomum*, *Saurauya* (spp.), *Litsea* spp., *Machilus*, *Syzygium and Cedrela toona*.

Khasi Subtropical Wet Hill Forests

Subtropical wet hill forests include hilly parts of Manipur, Shillong plateau evergreen forests and Tripura montane subtropical forests. These are dense evergreen forests of no great height, rarely exceeding 30 m in height with smooth cylindrical boles and branches making the crown. A second storey is hardly discernible in these forests, and there is a variable growth of shrubs. Here, forests have a heavy growth of epiphytes, mosses, ferns and phanerogams. The distribution of these broadleaved forests is confined to upper slopes of Khasi and Jaintia hills and the higher reaches of Garo Hills, usually above 1,300 m.

Floristic Composition

Oak and its varieties (*Quercus* spp.) are accompanied by *Manglietia insignis*, *Beilschmiedia*, *Cinnamomum* spp., *Machilus* spp., *Schima khasiana* and *Bucklandia*. The richness of the flora is remarkable, and the main reason is that it represents a mixture of both tropical and temperate floras. There are no tree ferns.

Sacred Groves and Richness of Flora in Meghalaya

The richness of flora of these subtropical wet hill forests is well preserved in the sacred groves of which as many as 79 are recorded (Tripathi 2005). These sacred groves known as 'Law Kyantang', 'Law Niam' and 'Law Lyngdoh' in Khasi Hills; 'Khloo blai' in Jaintia Hills; and 'Asheng Khosi' in Garo Hills are under the control of clan councils or local village *Durbars* or Syiemships or Dolloiships or Nokmaships. More than 12.5 % of these sacred groves are undisturbed with 100 % canopy cover, 25 % are dense with more than 40 % canopy cover and 20 % are sparse (10–40 % canopy cover), while 42.5 % of the groves are highly degraded.

The richness of the original flora on Meghalaya plateau, as it was before being subjected to anthropogenic impact, is evident from the fact that the flora in the sacred groves has 514 species representing 340 genera and 131 families (Tripathi 2005). The most representative forests of Meghalaya plateau can be seen in these sacred groves and the Nokrek Biosphere Reserve in Garo Hills area.

On Meghalaya plateau, shifting cultivation has greatly changed the original forest cover, presumed to have been broadleaved with or without pine. Similarly, considerable areas of open grassland, with scattered trees and adjoining pine or broadleaved forests in Nagaland Hills, are completely transformed into treeless grassy hilltops. Clearly, these are degraded and denuded forests, following centuries of shifting cultivation.

9.3.1.7 Subtropical Pine Forests

These forests are very similar to Himalayan pine forests. These are very frequently subjected to fire caused by local communities who are ever on look out for some land for shifting cultivation. These occur in Khasi Hills, Naga Hills and Manipur. These often grow on well-drained sandy soil. Near Shillong such forests occur in red soils. The observation of the present author is that the well-drained red soil, as seen near Shillong, has resulted from the weathering of Shillong group of rocks largely composed of quartzite. Such forests, though largely cleared, can still be seen on the campus of the North-Eastern Hill University (Photo 9.5).

The variety of pine that occurs in Khasi Hills, Naga Hills and Manipur is *Pinus insularis* widely known as *Pinus khasya*. These occur as pure stands, as seen on

Photo 9.5 Pine forest (*Pinus khasya*) Shillong

granite hills or in association with other trees. Though known typically as pine forests, other floral associates also occur. The floristics include:

I. *Pinus insularis*

II. 1. *Quercus griffithii*
2. *Quercus fenestrata*
3. *Acer oblonga*
4. *Magnolia campbellii*
5. *Prunus acuminates*
6. *Schima wallichii*

III. 1. *Rubus lasiocarpa*
2. *Rubus rubra*
3. *Rubus paniculatus*

Similar floristic composition is also found in Manipur, where *Pinus insularis* exists as pure stand, but other associations occur with the following species:

I. *Pinus insularis*

II. 1. *Quercus griffithii*
2. *Quercus serrata*
3. *Quercus* spp.
4. *Castanopsis* spp.
5. *Betula alnoides*
6. *Acer oblongum*

7. *Schima wallichii*
8. *Rhus spp.*
9. *Salix tetrasperma*
10. *Rhododendron arboreum*

III. 1. *Eurya pittosporum*
2. *Photinia*
3. *Myrsine*
4. *Indigofera*

Collectively these forests are floristically known as *Pinus–Quercus* formation, greatly impacted by anthropogenic causes.

9.3.1.8 Montane Temperate Forests

This zone incorporates the Eastern Himalayas, largely Arunachal Pradesh and parts of Manipur and Nagaland. In the description given below, Eastern Himalayas refers to the area above.

East Himalayan Wet Temperate Forests

In Arunachal Pradesh, such forests occur between 1,750 and 2,750 m altitude ASL and upper levels in Manipur, Nagaland and Mizoram. There is an altitudinal zonation, and three typical species occupy three altitudinal zones. The altitudinal zone and the predominant species are as follows:

Altitudinal zone (m)	Predominant species
1,800–2,100	*Lauraceae*, Laurel (*Machilus michelia*)
2,100–2,400	*Quercus lamellose*
2,500–2,750	*Quercus pachyphylla*

These often overlap with variations in altitude and topography.

In Aka Hills, in Arunachal, the most common association is *Quercus–Michelia–Acer–hylium* (Bor 1938). Similar association of trees also exists in Manipur at an altitude of 1,800–2,400 m ASL, with 3,500 mm of rain. Quercus at higher altitudes is often associated with *Rhododendron arboreum*. In Nagaland, on higher hills, along the Nagaland–Myanmar border from 1,800 m ASL upward, wet temperate forests are found. Though on more rounded rolling plateau lands, the forests are broken by grassland, especially in areas with less than 2,000 mm of rains.

The floral composition in higher areas of Nagaland is as follows:

I. 1. *Magnolia – Manglietia*
2. Quercus
3. *Acer prunus*
4. Pyrus

5. Bucklandia
6. *Betula alnoides*

II. Bamboos in the east
III. Evergreen shrubs

9.3.1.9 Eastern Himalayan Moist Temperate Forests

These according to altitude and character are subdivided into:

(a) East Himalayan mixed coniferous forests
(b) *Abies delavayi* forests

East Himalayan Mixed Coniferous Forests

They occur at altitudes ranging from 2,300 to 3,000 m, with rainfall of 1,500–2,000 mm. It is also given the name *Oak Rhododendron–Tsuga–Abies–hylium* forests. This type is formed by dense evergreen forests with oak and rhododendron, with clusters of hemlock varying in extent on drier ridges. Hemlock (Tsuga) gives way to silver fir at higher levels. In these forests, mixed deciduous trees, such as magnolia, acer and betula, are also found with oak. There is occasionally a dense undergrowth of bamboos and abundance of epiphytes. In Mishmi Hills, ferns are abundant sometimes attaining a height of 6 m.

Oak in a mixed coniferous type of forest occupies a portion midway between the wet and moist temperate forests.

Abies delavayi Forests

A species of fir, *Abies delavayi* believed to be a Chinese species, common in Szechuan province, occurs in pure stands confined to the northern slopes of the mountains, limited to a zone between 2,750 and 3,350 m altitude. Abies shows a height of 20 m possessing a girth of about 2 m.

Variations Because of Edaphic Control and Seral Types

In the general category of moist temperate forests of Arunachal, there are variations caused by soil conditions or variations representing a stage in succession, called seral type.

Cypress Forests

These occur in the middle ranges (1,800–2,800 m ASL), highly localised usually in limestone areas.

Photo 9.6 Alder trees (*Alnus hylis*) near Khonoma; they have nitrogen-fixing properties in their roots

Alder Forests

Commonly found at 1,800–2,000 m ASL, they have been reported by Bor. The association of trees given with alder is:

Populus
Alnus hylis
Fraxinus floribunda
Prunus nepalensis
Michelius edulis
With occasional *Pinus wallichiana*

There are also blue pine forests on the foothills of Bhabar region (Photo 9.6).

9.3.1.10 East Himalayan Dry Temperate Forests

The dry temperate forests of Arunachal Himalayas occur in areas with less than 1,500 mm of rainfall, usually at a height of 2,700–3,400 m ASL. These are mixed coniferous forests consisting largely of hemlock and spruce and varying amounts of blue pine, silver fir and juniper with species of rhododendron. The floristics of the dry temperate forests is as follows:

Pinus spinulosa – dominant species
Pinus wallichiana
Tsuga dumosa
Juniperus wallichiana
Rhododendron spp.

Larch Forests

Larch forests occur associated with conifers above 3,000 m ASL, usually near moraine area, in relatively open patches: Floristically the following species are common:

Larix griffithiana – larch dominant species
Pinus wallichiana
Abies
Piceae
Tsuga and *Rhododendron*

Eastern Himalayan Dry Juniper/Birch Forests

Juniper and birch occur at still higher levels ranging in height from 2,800 to 4,500 m. The species most common in this zone in Arunachal Pradesh are:

Juniperus wallichiana
Juniperus macropoda

Junipers here don't exceed 15–18 m in height. In some areas, above 3,000 m, *Hippophae myricaria* scrub, usually 3–6 m high, occur on gravel deposits and even colonise earth slides.

East Himalayan Sub-alpine Birch–Fir Forests

Above 3,000 m in the sub-alpine region, only these species survive. These are fir, birch and rhododendron, with occasional stunted *Quercus semecarpifolia*.

9.3.1.11 Sub-alpine Pastures

There are grasses making pastures in the sub-alpine region with very few trees of silver fir and spruce. The grasses in high altitude pastures in Arunachal Pradesh close to the Indo-Tibetan border consist of the following species:

1. *Agropyron longearistatum*
2. *Agropyron semicostatum*
3. *Brachypodium sylvaticum*
4. *Bromus asper*
5. *Bromus japonica*
6. *Dactylis* spp.
7. *Danthoria* spp.
8. *Festuca* spp.
9. M*ilium effusum*
10. *Oryzopsis*
11. *Phleum*

These are the grazing grounds of the pastoral people in high Himalayas.

9.3.1.12 Moist Alpine Scrub (3,000 m ASL and Above)

Birch–Rhododendron Scrub Forests

These are low evergreen forests almost entirely of rhododendron sp. with some birch and a few other deciduous trees. The stems of these trees are bent because of snow pressure during winter. These stunted trees are not more than 60 cm in girth. Moss or ferns cover the ground with shrubs and flowering herbs. In areas with heavy snowfall, a thick layer of black humus is usually present. The species that represent scrubland are *Betula utilis* (Himalayan birch) *Rhododendron campanulatum* and *Sorbus foliolosa*.

Dwarf Rhododendron Scrub

Further up, above 3,500 m ASL, the rhododendron thickets become a dwarf, attaining a height of 1.5–3 m in clusters of dense thickets in small patches. Rhododendron is mixed with various proportions of *Sorbus foliolosa* below. These rhododendron scrubs, though dominant between 4,600 and 5,000 m, ascend up to 5,500 m. The highest belt is occupied by *Rhododendron lepidotum* and *Rhododendron hypenanthum*. *Rhododendron nivale* occurs on rocks and glaciers.

Dry Alpine Scrub

These usually occur in the trans-Himalayan region with rainfall below 400 mm, as in Tibet. The characteristic plants in this region are *Eurotia ceratoides* which provide winterfat for grazing animals and fuel wood and thus are endangered. *Juniperus wallichiana* and *Juniperus communis* occur on the Tibetan side. Dwarf juniper patches are seen on the Indian side occasionally. Juniper is not eaten by grazing animals and is thus surviving.

Dwarf Juniper Scrub

The three subspecies occupy different levels.

Juniperus recurva	3,000–4,600 m ASL
Juniperus squamata	4,300–4,900 m ASL
Juniperus wallichiana on screes	up to 5,000 m ASL

9.3.2 Orchids: A Unique Floristic Element in the Forests of North-East India

One of the most important aspects of the forests of the North-East region is the profusion of orchids, the plants most commonly known for their beautiful appearance. Orchids, belonging to the family *Orchidaceae*, the most evolved family, with

Table 9.7 Number of genera and species of orchids in North-Eastern states

States	No. of orchid genera	No. of orchid species
Arunachal Pradesh	126	550
Assam	81	193
Manipur	69	251
Mizoram	75	244
Nagaland	63	241
Sikkim	137	525
Tripura	33	48

Source: Forests Departments of Northeast States (quoted from Medhi and Chakrabarti 2009)

roughly '1,000 genera and 25,000–35,000 species, exhibit an incredible range of diversity in size, shape and colour of their flowers' (Medhi and Chakrabarti 2009). A large majority of orchids are epiphytes and grow on trees, though there are some of terrestrial origin growing on rocks and mosses. Of the large global range of orchids, about 1,600 species, concentrated largely in the Himalayan region, are found in India. The North-East region of India, a biological hotspot, has 876 orchid species, which constitute 70 % of the total orchid flora of India (Jain 1985). Of the seven states of the region, Arunachal is the largest storehouse of orchids. The state of Sikkim, not included in the North-East region in this text, is equally rich in orchids. The state-wise distribution of orchids in the North-East region of India is as follows (Table 9.7).

The high humidity and thick growth of forests have helped the growth of orchids. The preservation of orchids in the region has been possible because of the traditional knowledge of the tribal communities of the region who value this plant, firstly because of its beauty and importance in rituals but no less because of the tradition of sacred groves, which are the nurseries for the preservation and dissemination of all varieties of plants.

Orchids in the North-East region are used for food, medicine, ornamentation, and other ritualistic purposes. *Rhynchostylis retusa* (Bihu orchid) is closely linked with the people of Assam and is known as *kopou phool* in Assamese. The flowering spike (inflorescence) is used by girls to adorn their hair during the spring festival – *Rongali Bihu*. Among the youth, this orchid is regarded as symbol of love. This also acts as a symbol of fertility and merriment. The inflorescence is also used in the marriage ceremony of the local people. Considering the importance of this orchid, it is usually seen under cultivation by most Assamese families (Medhi and Chakrabarti 2009).

The state of Arunachal, lying in the eastern Himalayan tract, has the highest number of species known among the states of India, and *Rhynchostylis retusa*, the most commonly found orchid in the state, is the state flower of Arunachal. The state has set up an Orchid Research and Development Centre at Tipi. In Tipi Orchid Research Centre, over 500 species are found to occur. Sessa, the 'orchid paradise' of India, is 15 miles (25 km) from Tipi, and it has an orchid sanctuary, which abounds in a large variety of species (Tandon and Kumaria 2010).

Excessive use of orchids for ornamentation has attracted the attention of foresters and farmers, all over North-East India. The commercial interest generated in orchids may help preserve the large variety of species of the plant. This would be a boost to the traditional efforts of the tribal communities who have preserved the plant for its myriad uses.

Another flowering plant that has, of late, entered the international market is *Anthurium*, largely cultivated in Mizoram. A member of *Araceae* family, anthurium is native of the tropics of Central and South America (Lalmunmawia and Khawlhring 2011). It is an important plant in the floriculture of Mizoram and has the potential to earn considerable revenue for the state.

9.4 Biodiversity and Nature Conservation in North-East India

North-East India is richly endowed with a great a variety of plant and animal life, including many endemic species of plants. The eastern Himalayan province of Arunachal Pradesh, Nagaland and Manipur is considered as one of the two hotspots of biodiversity in India, the second being the Western Ghats. Half of the total number of floral species of India occurs in this region (Murti and Joseph 1984). The region forms the richest reservoir of genetic variability; and the presence of a large number of primitive plants makes North-East India the 'cradle of flowering plants'. On account of its unique geographical, topographical, altitudinal and ecological variation, the region has been the theatre of evolutionary development of several angiosperms, like Magnolias, Michelia, Rhododendron, Camellia and orchids. The region, as a whole, forms the active speciation zone due to natural mutation, hybridisation and floral evolution (Murti and Joseph 1984). The forests of the North-East are the storehouse of the wild species of many important cultivated plants like paddy, banana, citrus, jute, sugarcane, ginger and tea, with genetic variety met even in these plants. The region is considered the natural home of several citrus species, and it has been unequivocally established that *Citrus indica*, *Citrus assamensis*, *Citrus macroptera*, *Citrus ichangensis* and several other species of citrus are indigenous to North-Eastern Himalayan region (Singh 1984). F. Kingdon Ward, the renowned plant explorer who explored the North-Eastern region of India botanically, observed that 'the botanical collection from Assam Himalayas (Balipara Frontier tract) amounts to nearly a thousand species including an unknown number' (Kingdon Ward 1940).

The rich biodiversity of the North-East region owes itself, firstly, to its location on the margin of the tropics, though low Brahmaputra valley with high monsoon summer rainfall creates ecological conditions that are comparable to those of tropics. Secondly, the altitudinal zonation, from Brahmaputra valley to the lofty Himalayas, creates conditions that are akin to latitudinal zonation from the equatorial region to temperate latitudes. Thus, in North-East India, there is a wide range of vegetation varying from the tropical plants in the Brahmaputra lowland to the

temperate and cold temperate species in the Himalayan region, beyond 3,000–4,000 m ASL. In fact, even 'the Himalayan range', as Troupe (1986) once observed, 'exhibits climatic regions beginning from tropical, through sub-tropical, warm and cool temperate to alpine and arctic, and changes in the forest flora are marked by well defined zones of altitude'. Yet, another reason for the rich biodiversity of the region is its location on the crossroad of different botanical provinces, Chinese, Southeast Asian and Indian. One may even add that before the arrival of the British in the early nineteenth century, the flora of the region was virtually untouched and the much reviled shifting cultivation, *jhuming*, practised by a small tribal population, did not inflict very severe damage. But as the population increased, economy expanded and an industrial era arrived, ever increasing damage was done to the richness and variety of flora as well fauna of the region.

9.4.1 Faunal Richness and Variety in the Region

The faunal richness of the region is explained by its location, being 'the gateway through which Indo-Chinese element of oriental fauna, and that of palaearctic fauna spread to the Indian subcontinent. As a result, a complex assemblage of Indo-Chinese, Indo-Malayan, Ethiopian, and Palaearctic montane elements could now be observed in the region' (Ghosh and Tiwari 1984:105).

More than 50 % of the total mammalian genera of India are found in North-East India, and a large number of them, e.g. *Tupaia* (treeshrew), *Nycticebus* (slow loris), *Hylobates* (*gibbon*), *Atherurus* (brush-tailed porcupine), *Rhizomys* (bamboo rat) and *Cannomys* (lesser bamboo rat), are not found anywhere in India. A total of more than 500 different species of mammals are known in India, of which North-East India alone has around 160 species. The mammalian fauna, which form the largest part of wildlife resources of the region, include primates (apes, monkeys, langurs), cats (tiger, cat, leopard, civets), *Proboscidea* (elephants), *Ungulates* (rhinoceros, dear, pigs) and small mammals, insectivores (moles and shrews), *Lagomorpha* (hares, rabbits) and rodents (rats, mice, squirrels).

The North-East of India has 31 species of carnivores, which include the dog, the bear, the weasel, the civets and the cat families. The most well known are the members of the cat family which include the royal Bengal tiger, leopard, clouded leopard, the golden cat and other lesser cats. It is hard to find many such areas as the North-East which possesses such a variety of carnivores. The most spectacular faunal wealth of North-Eastern India is characterised by some unique species. The great Indian one-horned rhinoceros and Indian elephant are the most spectacular animals of the region. Besides, the North-East is known for its avifauna and reptiles. The sanctuaries of Kaziranga and Manas form the habitat of a great variety of birds.

A number of animal species are now included in the list of protected animals. These include golden cat, clouded leopard, leopard, slow loris, black buck and tiger. Some others are endangered and are fighting for their survival. These include Indian bison, capped langur, flying squirrel, wild dog, chital, Himalayan black bear and

Table 9.8 Biodiversity in North-East India

Plant group	No. of species	Animal group	No. of species
Flowering Plants	7,500	Butterflies	183
Orchids	700	Molluscs	50
Bamboos	58	Fishes	236
Citrus	64	Amphibians	64
Conifers	28	Reptiles	137
Mosses	500	Birds	541
Ferns	700	Mammalians	160
Lichens	728		

Sources:
1. Gupta (2008)
2. Ghosh and Tiwari (1984:105–109)

several others. It must be mentioned that serious efforts are being made to protect many of these animals especially rhinos, tiger, pygmy hog and several others. Of the invertebrates, butterflies of North-East India have attracted greatest attention. As many as 185 species, 20 % of the total butterfly species known in India have been recorded in this region.

Biodiversity in the North-East region is approximately illustrated by Table 9.8.

9.4.2 Need for the Preservation of the Biodiversity of the Region

The biosphere of North-Eastern India, rich in plant and animal life, needs conservation as well as protection. It is all the more so because of a high level of endemism. About 32 % of plants known from the region are endemic (Tandon and Kumaria 2010). There is a clear awakening on the part of the public and the governments, under some kind of institutional pressure from international organisations like International Union for the Conservation of Nature (IUCN) and the World Wildlife Fund. Both these organisations are actively involved in the conservation of nature and protection of wildlife. The Government of India and the State Governments of the North-Eastern region have embarked on protection measures, by passing statuary laws and enforcing actively the Forest and WildLife Protection Acts, of the Central Government.

Like the rest of India, a number of biospheres, national parks and wildlife sanctuaries (2004) were established to protect the biodiversity of the region and particularly to protect some of the faunal species, which appeared to be threatened (Fig. 9.3). Of the biospheres, four are in the North-East region and form part of the world network of Biosphere Reserves, under the UNESCO (Table 9.9).

The biodiversity in some states of the North-East region, like Meghalaya, Manipur and Karbi-Anglong plateau of Assam, has been traditionally preserved by

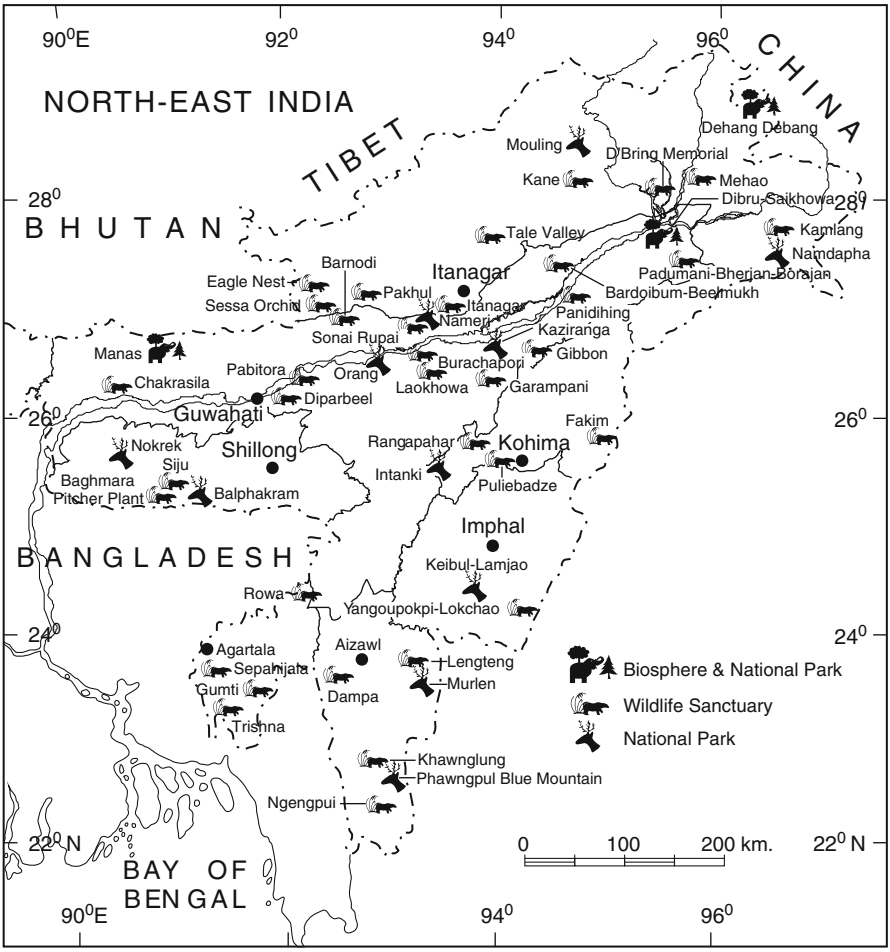

Fig. 9.3 Locations of biospheres, wildlife sanctuaries and national parks in the states of North-East India (Details of the parks are given in the appendices at the end of the chapter)

what is known as *sacred groves*. These forest groves were considered sacred by the local tribal communities and remained intact for centuries. That was the traditional way of preserving biodiversity. A team of botanists, led by Prof. Tripathi (2005),[1] documented as many as 79 sacred groves in Meghalaya. The fact that 57.5 % of the sacred groves are still in good condition, and some of them are quite intact despite various kinds of anthropogenic disturbances, such as shifting cultivation, shows that the religious beliefs and taboos have certainly contributed to the protection of the sacred groves.

[1] Tripathi (2005).

Table 9.9 Number and area of biospheres, national parks and wildlife sanctuaries in the North-East

States	Biospheres		National parks		Wildlife sanctuaries		Total number of protected area	
	Number	Area (km^2)	Number	Area (km^2)	Number	Area (km^2)	Number	Area (km^2)
Sikkim	1	2,620	1	1784.0	5	265.1	7	4669.1
Assam	2	3,602	5	1589.8	12	527.3	19	5719.1
Arunachal	1	5,112	2	2468.23	10	7114.45	13	14694.68
Manipur	–	–	1	40.0	1	184.8	2	22.8
Mizoram	–	–	2	250.0	4	771.0	6	1021.0
Meghalaya	1	820	2	267.48	3	34.2	6	1121.68
Nagaland	–	–	1	202.2	3	20.35	4	222.55
Tripura	–	–	–	–	4	603.62	4	603.62
Total for North-East	5	12,154	14	6601.71	42	9520.82	61	28,276

Source: Forest Survey of India, Government of India (2005)

Despite the best efforts of the government agencies and international organisations, preservation of biodiversity in this region is proving a difficult task. There are several reasons for this. An increase in the number of population of the area exerts greater pressure on the plant and faunal resources of the region. Development of projects, like the road network, building of hydroelectric projects on the rivers in densely forested areas, expansion of agricultural land by cutting and burning forests besides the traditional *jhuming* practice, are the challenges to the preservation of the rich biodiversity of the region. The flooding of the rivers during the monsoon often results in the animals being trapped. And poaching of animals by national and international poaching groups is perhaps the most serious challenge to the biodiversity of the region. A heightened awareness of the people, who are proud of the bio-resources of the region, may help in their participation in the effort to save the plant and animal species from extinction.

9.4.3 Forest Economy

Unlike many other parts of India, forests of North-East India have greatly contributed to the economy of the country and the region. Till the mid-twentieth century, the value of the forests was considered almost exclusively in economic terms. The establishment of forest department and the management of Indian forests, including their survey, classification, conservation and exploitation, managed through a well established forest department of Government of India, were all aimed at preserving and exploiting their economic utility. Timber was the most important product, either for the British fleets, railway slippers, or for public buildings. The reserved and protected forests were the prime focus of the forest departments.

Table 9.10 State of forestry and logging in the net domestic product of the states

States	Net state domestic product (in lakhs Rs.)	Income from forestry and logging (in lakhs Rs.)	Percentage contribution of forests
Arunachal Pradesh	388,825	6,506	1.67
Assam	7,927,666	80,475	1.05
Manipur	418,130	7,018	1.67
Meghalaya	750,630	10,327	1.37
Mizoram	318,422	2,499	0.37
Nagaland	469,875	11,652	2.47
Tripura	954,628	9,634	1.09

Source: Annual Economic Survey of different states for 2006–2007, for Nagaland it is 2003–2004

The forest products of economic value include timber, bamboos and minor products. While the timber includes teak, sal, deodar, rosewood, sandal, babool and iron wood, minor products include grass, lac, dyes, cardamoms, myrobalans and other tanning materials. Along with these, bamboo is the most valued product. The revenue from forests, in the North-East region, comes from the exploitation of timber or industrial wood, fuel wood, bamboo, grasses, cane, stone, thatching material and sand.

The paper and pulp and the plywood industry of the North-East is supplied the necessary raw material from the forests. But despite all the uses mentioned earlier, the total revenue from the forests is not significant, and, in most states, forms only 1 % of the Net State Domestic Product. The figures in Table 9.10 are revealing.

As can be seen, in almost all states, with the exception of Nagaland, the contribution of forests to the economy of the states is around 1 %. In case of Nagaland, it is a little higher, reaching 2 %. In absolute terms, forests of Assam contribute over eight billion Indian rupees or 160 million US dollars annually to the state's net domestic production. The parameters for assessment of the value and importance of forests and other natural vegetation have undergone a change. Revenue from forests is no longer the primary consideration in their preservation. They are valued as the storehouse of a large mass of plant resources and their genetic diversity. Another contribution of forests, widely recognised, is as a sink for the atmospheric CO_2, the dominant gas responsible for global warming. They have an important role in preventing excessive accumulation of carbon dioxide in the atmosphere by absorbing some carbon dioxide during the process of photosynthesis. Providing suitable habitat for varieties of animals, particularly large terrestrial ones, is another aspect of their role in preserving other bio-forms. Prevention of soil erosion and landslides and absorption of considerable amount of rainwater to prevent floods are other important roles assigned to forests.

While the importance of forests as the primary source of food, fuel and fodder remains still significant, their importance has increased manyfold with their emerging role as absorbers of CO_2 and as an element in landscape for maintaining some stability and bringing about an equilibrium.

Appendices

Appendix 9.1: National Parks in the North-East Region

No.	Name of the park	Location	Area (km^2)	Date of establishment
1.	Kanchendzonga	NW Sikkim	1,784	1977
2.	Murien N. P.	Champhai (Mizoram)	200	1991
3.	Phawngpui Blue Mountain N. P.	Chhimtuipui (Mizoram)	50	1997
4.	Balphakram N. P.	South Garo Hills (Meghalaya)	220	1986
5.	Nokrek N. P.	Garo Hills (Meghalaya)	47.48	1986
6.	Dibru Saikhowa N. P.	Dibrugarh (Assam)	340	1999 an extended area is also biosphere R.
7.	Kaziranga N. P.	Golaghat and Nagaon (Assam)	471.71	1974
8.	Manas N. P.	Barpeta and Bongaigaon (Assam)	500	1990 It is also a biosphere R.
9.	Nameri N. P.	Sonitpur district (Assam)	200	1998
10.	Orang N. P.	Sonitpur and Darrang (Assam)	78.8	1999
11.	Ntangki N. P.	Dimapur (Nagaland)	202.2	1993
12.	Mouling N. P.	Upper Siang (Arunachal Pradesh)	483	1986
13.	Namdapha N. P.	Changlang (Arunachal Pradesh)	1985.23	1983
Total	13 National Parks		6562.4	

Wildlife Sanctuaries

Though most of the national parks have wildlife, they are not the sanctuaries like the wildlife sanctuaries whose primary function is to provide sanctuary to wildlife and to protect the endangered species. While national parks are important as preserves of plant, wildlife sanctuaries are the preserves for wildlife.

Appendix 9.2: Wildlife Sanctuaries in North-East India

No.	Name of wildlife sanctuary	Location	Area (km^2)	Date of establishment
Mizoram				
1.	Dampa WLS	Mamit district	500.0	1985
2.	Khawnglung WLS	Serchhip dist.	41.0	1991
3.	Lengteng WLS	Champhai dist.	120.0	1999
4.	Ngengpui WLS	Chhimtuipui (W)	110.0	1997

(continued)

(continued)

No.	Name of wildlife sanctuary	Location	Area (km^2)	Date of establishment
Tripura				
1.	Gumti WLS	South Tripura	389.54	1988
2.	Rowa WLS	North Tripura	0.85	1988
3.	Sepahijala WLS	West Tripura	18.53	1987
4.	Trishna WLS	South Tripura	194.70	1987
Meghalaya				
1.	Baghmara Pitcher Plant WLS	South Garo Hills	0.02	1984
2.	Nongkhyllem WLS	Ri Bhoi	29.00	1981
3.	Siju	South Garo Hills	5.18	1979
Assam				
1.	Bornadi WLS	Darrang dist.	26.22	1980
2.	Burachapori WLS	Sonitpur dist.	44.06	1995
3.	Chakrashila WLS	Dhubri dist.	45.56	1994
4.	Dipor Bil WLS	Kamrup dist.	4.14	1989
5.	Garampani WLS	Karbi-Anglong	6.05	1952
6.	Gibbon WLS	Jorhat dist.	20.98	1997
7.	Laokhowa WLS	Nagaon dist.	70.13	1974
8.	Panidihing WLS	Sibsagar dist.	33.93	1999
9.	Pobitora WLS	Nagaon dist.	38.81	1999
10.	Padumani–Bherjan–Borajan WLS	Dibrugarh dist.	7.29	1999
11.	Sonai Rupai WLS	Darrang dist.	26.22	1998
Arunachal Pradesh				
1.	D'Ering Memorial (Lali) WLS	East Siang	190.0	1978
2.	Dibang WLS	Dibang valley	4149.0	1991
3.	Eagle Nest WLS	West Kameng	217.0	1989
4.	Itanagar WLS	Papum Pare	140.3	1978
5.	Kamlang WLS	Lohit	783.0	1989
6.	Kane WLS	West Siang	55.0	1991
7.	Mehao WLS	Dibang valley	281.5	1980
8.	Pakhui WLS	East Kameng	861.95	1977
9.	Sessa Orchid WLS	West Kameng	100.0	1989
10.	Tale valley WLS	Lower Subansiri	337.0	1995
Nagaland				
1.	1.	Kohima dist.	9.23	1980
2.	2.	Dimapur dist.	4.70	1986

References

Bhagabati AK, Bhattacharya P (2009) Deforestation and human animal conflict in north bank landscape (Bhalukpong area of the Brahmaputra valley). In: Bhagabati AK (ed) Areas of concern: geographical status of selected problem areas of Assam. Geography Department, Gauhati University, Guwahati, pp 50–66

Bor NL (1935) Conifers of Balipara Frontier Tract. Indian For 61(5):313–319

Bor NL (1938) A sketch of the vegetation of Aka Hills, Assam: a syn-ecological study. Indian For Rec 1:103–107
Bor NL (1942) Relict vegetation of Shillong Plateau, Assam. Indian For Rec, Botany 3:153–195
Bora AK (2009) Forests of Barak valley: the case of Upper Jiri reserved forests. In: Bhagabati AK (ed) Areas of concern: geographical status of selected problem areas of Assam. Geography Department, Gauhati University, Guwahati, pp 23–35
Brandis D (1906) (1990, reprint) Indian trees: an account of trees, shrubs, woody climbers, bamboos and palms in British Empire. Constable and Co, London
Chakrabarti S (2009) Conservation of orchids by the people of North Eastern India. NeBIO, NECEER, Imphal, pp 48–52
Champion HG (1936) A preliminary survey of the forest types of India and Burma. Indian Forest Records (New series), vol I:1–179. Manager of Publications, Delhi, p 173
Champion HG, Seth SK (1968) A revised survey of forest types of India. Natraj Publishers, Dehra Dun, 404 p.
Davy BJ (1939) Review on the classification of tropical woody vegetation types. Indian For Rec 13:81–83
Deb DB (1960) Forest types studies in Manipur. Indian For 86(29):94–111
Forest Survey of India, Government of India (2005) State of the Forest Report. Forest Survey of India, Ministry of Environment and Forest, Dehradun
Gamble JS (1881) Manuel of Indian timber: a summary of 906 species of timber, their rate of growth and other matters, 2nd edn. Flora of British India, Dehradun (reprint 2002)
Gazetteer of India (1999) Assam state, vol I. Government of Assam, Guwahati
Ghosh AK, Tiwari KK (1984) Faunal resources of North-East India. In: Tripathi RS (ed) Resource potential of North-East India, vol II, Living resources. Meghalaya Science Society, Shillong
Gupta AK (2008) Biodiversity and wildlife research in Northeast India. New Initiatives by the Wildlife Institute of India, Dehradun, Chap. 18.2
Hazarika R, Saikia A (2009) Land use and fragmentation in Karbi–Anglong, Assam. In: Bhagabati AK (ed) Areas of concern: geographical status of selected problem areas of Assam. Geography Department, Gauhati University, Guwahati, pp 73–79
Hegde SN (1984) Orchids of Arunachal Pradesh. Arunachal Pradesh Forest Department, Itanagar, quoted from Chakrabarti, Syamali op.cit
Jain SK (1985) Conservation of orchids in India. In: Chadha KL, Singh H (eds) Progress in orchid research. IIHR/UNDP, Bangalore
Kingdon Ward F (1940) Botanical and geographical exploration in the Assam Himalayas. Geogr J 96(1):1–13
Kingdon Ward F (1941) Assam adventure. Jonathan Cape, London
Kumar Y, Syiemlieh HJ, Singh S (2008) Vegetation cover and plant species of degraded landscape in the extremely wet Cherrapunji area. Trans Inst Indian Geogr 30(2):111–124
Lalmunmawia F, Khawlhring N (2011) Cultivation of anthurium in Mizoram, India, present scenario and future prospect. Sci Vis 11(4):203–207
Luna RK (2005) Plantation trees. International Book Publishers, Dehradun
Medhi RP, Chakrabarti S (2009) Traditional knowledge of NE people on conservation of wild orchids. Indian J Tradit Knowl 8(1):11–16
Murti SK, Joseph J (1984) Plant resources in Northeast India, vol II. Meghalaya Science Society, Shillong, pp 28–39
National Parks and Wildlife Sanctuaries (2004) http://www.wii.gov.in/envis/envis_pa_network/page_states_ut_htm
Puri GS (1960) Indian forest ecology. Oxford Book & Stationary Co., New Delhi
Rajkhowa S (1961a) Regeneration of Upper Assam Dipterocarpus-Mesua Forests. Indian For 87(1):406–425
Rajkhowa S (1961b) Forest types of Assam with special reference to the evergreen and semi-evergreen forests. Indian For 87(9):520–541

Rowntree JB (1954) An introduction to the vegetation of Assam valley. Indian For Rec NS 9(1):1–87
Seth SK, Yadav JSP (1960) Soils of the tropical moist evergreen forests of India. Indian For 86(7):401–413
Singh B (1984) Conservation of genetic resources of eastern Himalayan region with special reference to citrus. In: Tripathi RS (ed) Resource potential of North-East India, vol II, Living resources. Meghalaya Science Soc, Shillong, pp 17–21
Directorate of Economics & Statistics (2006) Statistical handbook of Assam. Government of Assam, Guwahati
Stebbing EP (1962) In: Champion SH, Osmaton FC (eds) Forests of India, vol IV, Being the history from 1925 to 1947 of the forests now in Burma, India & Pakistan. OUP, London
Strachey PD (1956) Development of forestry in Assam in the last fifty years. Indian For 82(2):619–623
Tandon P, Kumaria S (2010) Forest resources of North East India and their sustainable utilization. In: Hasnain SE et al (eds) Biotechnology for sustainable development: achievements and challenges. McGraw Hill Education, New Delhi, pp 183–191
Tripathi RS (2005) Sacred groves of Northeast India and their floristic richness and significance in biodiversity conservation. EnviroNews-Newslett ISEB India 11(3):1–2
Troupe RS (1986, reprint) The silviculture of Indian trees, 3 vols. Originally published by International Book Publishers, Dehradun

Part III
The People

Chapter 10
Early Colonisation of North-East India

Abstract The earliest signs of human occupance in the North-East region are generally believed to have occurred during the Neolithic or at the earliest, mid-Palaeolithic times. The widespread occurrence of Megaliths in the region suggests a continuation of human culture for millennia. Whether these very early settlers evolved into successive generations of proto- and early historic human societies is a difficult question. The present distribution of different racial and linguistic groups leads one to believe that the earliest colonisers of this region were the Mongoloid people. On the basis of language, three distinct groups occupying three distinct regions can be identified. The Mongoloid people, speaking Tibeto-Burman language, were perhaps the first group to arrive from Tibet or adjacent areas, followed by people of eastern peripheral mountains, including the Nagas who spilled over from the Burmese highland. The Austric or Austro-Asiatic group, represented by the Khasis-Syntengs, is like an island in Bodo speaking sea of humanity. By all accounts, Bodos and Bodo-speaking people were one of the first to colonise Assam, away from the flood plain of Brahmaputra. The Bodos, as they dispersed, adopted different identities, like Garos, or Mech, or Kacharis or any other. They are the oldest and the most widely diffused group in the North-East region. The next important group that arrived in North-East India, though remained confined to Brahmaputra valley, were the Indo-Aryans who brought with them an Indo-Aryan language and a culture that reflected the tradition and style of a different ethnic group. In fact, the Indo-Aryans gradually absorbed in their fold a large section of Bodo and allied groups through conversion to their faith. The arrival of Ahoms in Assam in the thirteenth century brought another group in the reckoning. Most of these groups finally adopted an Indo-Aryan language – in the present case, the Assamese, and Hinduism as their faith, till Islam made its appearance with the invaders from Bengal in the fourteenth century. The early settlers were certainly the Mongoloid people, the Bodos, who assumed different names in different regions. The coming of Indo-Aryans in the region, however, changed the complexion of the society.

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Unlike the rest of India, the North-Eastern part of the country was colonised much later. This could be largely attributed to its relative isolation, not so much because of its peripheral location, as to the formidable barriers that surrounded it from all sides. On the north, the region is bound by the lofty ranges of Himalayas, and on the east it is almost an uninterrupted chain of mountains running north–south, starting from Patkai Hills in the north, merging into Naga Hills which finally end in Mizo Hills further south. A few passes in these mountains provide the openings through which immigrants came to Assam following the Brahmaputra valley: They may have also come from the Trans-Himalayan zone, descending down the hills following transverse river valleys that join the Brahmaputra. The Meghalaya plateau and the hills of North Cachar overlook the Bengal plain, particularly the latter's eastern part, now known as Bangladesh, and presented themselves as barriers to any northward movement from Bengal plain to none-too-attractive hilly areas with poor resources. The Meghalaya plateau has an escarpment about 1,500 m high, overlooking the fertile Sylhet plain on its southern edge, and a migration from plain to the unproductive plateau in the north was not an appealing proposition. The British later used this short route to reach Brahmaputra valley and finally occupied the whole of the North-Eastern region. The forest-clad highlands on Burmese border were not as inhospitable as the malarious Brahmaputra plain, to have repelled earlier settlers. And once settled, the highlands of eastern region with hostile tribes, like Nagas, Kukis and Mizos, prevented other groups from entering their domain. The Brahmaputra, on the west, also formed a barrier. Though not surmountable in later times, for earlier settlers it must have been quite an awe-inspiring and an effective barrier in moving eastward.

10.1 Traces of Human Occupance

When man first set his foot on the soil of the North-East is not an easy question to be answered with certainty, but the information available thus far points to a period dating back probably to Palaeolithic, but most certainly to Neolithic period, when man was wandering around in North Cachar Hills, Meghalaya plateau, the Naga Hills and even the Brahmaputra plain. In fact, by mid-Neolithic, the North-East region was dotted with sites that have left traces of man's occupation.

Though, there were no systematic archaeological excavations in the North-East in the nineteenth century, British administrators who occupied positions in different parts of the region continued collecting tools and implements which they suspected belonged to early man. Sir John Lubbock (1867) was the first person to refer to the find of Neolithic implements in upper Assam (Dani 1960). Others who are noted for their collection of Neolithic tools include E. H. Steel, J. H. Hutton, J. P. Mills, G. D. Walker, J. H. Grace and C. R. Pawsey. Many of them, but more specially J. P. Mills and J. H. Hutton, are well known for their interest and writings on Nagaland. Many of these tools, collected by Hutton, Mills and Pawsey, are housed in the Pitt Rivers Museum, Oxford. The large collection of Neolithic tools has been gathered from the areas marked by numerous megaliths as in western

Nagaland and Jaintia Hill areas, but their relationship is not clear, nor can they be ascribed to the same period. A summary of the collection of these tools exists in Dani's (1960) Ph.D. dissertation, subsequently published under the title *Prehistory and Protohistory of Eastern India*. Much of the work done before 1960, a bit outdated, is summarised and commented upon in this book. In his opinion 'the analysis of tools suggests that the Neolithic cultures of Assam, as represented by these stone tools, are of late origin' (1960:77).

10.1.1 Recent Investigations

A considerable volume of archaeological work, based on excavations, is accomplished during the last four decades, primarily by the archaeologists stationed in the North-Eastern states. This could be largely ascribed to the establishment of anthropology departments in the universities like Gauhati, Dibrugarh and subsequently at Shillong in NEHU. After struggling in the initial years with the analysis of collected tools (Goswami and Bhagabati 1959), serious investigation was started with the excavations in Assam, Meghalaya and Tripura. Some of the archaeologists, following T. C. Sharma, believe that man was in the North-East even during the Palaeolithic period. Sharma (1972) has discovered an Acheulian complex represented by cemented gravel of Waran river containing hand axes, cleavers and choppers made of dolerite. Similarly, in the Daphabum area of Lohit district, Bopardikar (1972) has found in the terraces of Kamlong and Telly rivers choppers, proto-hand axes, etc., suggesting a Palaeolithic origin.

This suggests that man was in the North-East even during Palaeolithic times, both on the eastern extremity of the Brahmaputra valley and on the Garo Hills. The sites mentioned above are, however, not dated precisely, and their antiquity established only with the help of typology of tools. Sharma considers the Garo Hills Acheulian tools to be the extension of the Indian Acheulian complex. But eastern India is very poor in Palaeolithic cultures. The surface finds of Acheulian tools in Lohit area were just part of a report and don't appear very convincing. While the Palaeolithic of Lohit valley has to be treated with caution, that of Garo Hills appear only probable. Besides, the Acheulian has a range, which may extend from several hundred thousand years to tens of thousands years, as sometimes the lower Palaeolithic grade into middle Palaeolithic and the artifacts of the two periods may occur concurrently a different sites.

Besides the controversial Palaeolithic sites – the views of T. C. Sharma are not widely shared – there are many well-recognised Neolithic sites. Added to this is the fact that the surface collection of ground and polished stone tools has been reported from almost all districts of Assam (Ghosh 1989).

In Meghalaya, the sites where chipped and ground tools are exposed include (1) Chitra Abri, (2) Rengchengiri, (3) Ringigiri and (4) Selbalgiri. These tools made of dolerite are patinated and are represented by chipped and ground stone axes. In Nagaland, Rokimi, Karami, Siromi, Lazimi, Itumi and Lokhimi are the sites where axes made of greenstone, a variety of diorite, have been found. Similarly, stray finds

of ground and polished stone tools made of sandstone, schist and gneiss are reported from Lohit, Siang and Kameng districts. In Tripura, few axes of fossil wood are reported and stone tools are largely reported even from Manipur and Mizoram.

But more significant are the excavations that have yielded hordes of tools and pottery at three or four different sites in North-East India. These excavated sites are:

1. Deojali Hading – North Cachar Hills district – excavated by T. C. Sharma of Guwahati
2. Sarutaru – Kamrup district – excavated by S. N. Rao of Dibrugarh University
3. Selbalgiri – in Garo Hills

Of these, Hading site excavated during 1961–1964 has a 75 cm deep culture, where large number of axes, adges, grinding stones, querus, mullers and pestles have been found, besides coarse pottery. The excavation at Sarutaru yielded stone celts, charcoal and potshards. Rao thinks that Sarutaru presents a cultural continuum from Neolithic to the present. The Selbalgiri excavation of Garo Hills yielded from the hillock on the left bank of Rongram river tools and pottery from the highest terrace (T_1) 40 m above the streambed. The Neolithic finds either from Garo Hills or from North Cachar Hills are not exactly dated, but based on typology, these are comparable to Hoabinhian culture of Southeast Asia, dated approximately 10,000 B.C. (Gorman 1971). The only dated Neolithic finds are the ones collected by two geologists Poddar and Ramesh (1983), who observed ground and polished celts. A large number of these tools are made of fossil wood, which is dated 3,400 ± 150 BP. Thus, there is a firm absolute dating of mid-second millennium BC, at the upper end of the chronological scale of the Neolithic tradition of this region, which may provisionally be equally applicable to the entire North-East region, with the caveat that a solitary date is not enough to assign the Neolithic culture of the entire region to this time bracket. It may be noted that tribal people of this region used Neolithic implements as late as the nineteenth century of our era (Bhuyan 1993; Godwin-Austen 1875).

There are few significant facts that give us an idea of the approximate dates of early man. The first is the relative absence of Palaeolithic tools, suggesting that the cultures developed here by man are not too old. Secondly, the dated Neolithic tools of fossil wood found in Tripura don't extend beyond 1500 B.C. Thirdly, there appears a cultural continuum at some sites like Sarutaru as suggested by Rao. And lastly, stone tools were used as late as mid-nineteenth century in the midst of wild in the North-East as suggested by Godwin Austen. There appears to be a convergence of these findings towards a relatively late arrival of man in this part of the country. One could perhaps say not earlier than 2000 B.C.

A definite clue, however, lies in the C^{14} dating of the higher terrace of Rongram river. This was studied by Mehdi (1980) for his Ph.D., but no precise dating was attempted. A large segment of opinion among the archaeologists believes that there are no Palaeolithic sites[1] in North-East India, and the earliest, one can think of, would be the middle Palaeolithic.

[1] Oral communication from V. N. Misra, Ex-Director Deccan College, Pune.

Photo 10.1 Naga menhirs at Khonoma, an Angami Naga village, 25 km south of Kohima

10.1.2 Megaliths

Another prehistoric as well as proto-historic find in India is the megaliths. Megaliths are the proto-historic monuments of humanity. These are usually of three types: (1) menhirs which are memorial stones ranging from 60 cm to 4 m in height, (2) cromlechs and (3) dolmenoid cists. The last two are the ossuaries meant for depositing bones of the dead. In most cases, the megaliths of North-East India are menhirs. In Nagaland, bones are kept in ossuaries for a specific period, but these are not made of stones. The stone megaliths in Nagaland are the memorial stones to mark the achievement of some distinguished individual (Photo 10.1). These megaliths, unlike the Palaeolithic and Neolithic tools, are found all over North-Eastern India, though more frequently in the Khasi and Jaintia Hills where the tallest megalith is sited at Nartiang about 50 km southeast of Shillong. It is an 8 m tall monument. An equally important site in Khasi Hills district is Laitlyngkot. Like the prehistoric tools and sites, megaliths are also an indication of early human habitation.

Who were the people who developed these sites and left the imprint of their occupance is a difficult question. Did these people gradually evolve into the contemporary society by absorbing innovations from immigrant groups, who arrived subsequently, while retaining much of their own cultures? To establish connection between the makers of prehistoric tools and the occupants of the prehistoric sites could be possible only if ancient skeletons were discovered and their DNA could be matched with those occupying those sites.

10.2 Succession and Sequence of the Arrival of Different Human Groups

North-East has more than 200 tribal groups. These groups arriving at different times assumed different names. The present society of the North-East region of India is constituted by broadly two major ethnic groups, viz. Mongoloids and Indo-Aryans, with a smaller Austric group represented by the Khasis and Jaintias. There are also suggestions that there is also a Negroid element in the population of the North-East, though it is not very visible. There is little doubt that the Mongoloid group appeared in the mountains, plateaus and valleys of North-East India much before the Indo-Aryans arrived in the Gangetic plain. This is clear not only from the geographical spread of the Mongoloid group occupying even the remotest parts of the region, but also from the contiguity of the Tibeto-Burman region in the states of the North-East. S. K. Chatterjee (1950) believes that 'Mongoloids formed a most noteworthy (though culturally far less effective) element in the population of the North-Eastern and Eastern India…. It would appear that their presence in India was noted by the 10th century BC when the Veda books were compiled. The composite Hindu (i.e. Austric, Dravidian – Aryan or Indo-Gangetic) civilisation reached the Mongoloid peoples of the North-East mountains and plains from about that date' (Chatterjee 1950:154). In his argument, Chatterjee may have been guided by the reference to Bhagadatta, the chief of the Kiratas in the Mahabharata war, which is believed to have been fought around 900 B.C. While there is almost a total absence of Indo-Aryan ethnic elements in Mizoram, Nagaland, Meghalaya, Arunachal Pradesh, Manipur and even the North Cachar Hills and Karbi-Anglong of Assam, the situation is not similar in the Assam valley which shows a prominent Indo-Aryan ethnic element, but the Mongoloid element is equally present if not dominant. The Assam valley is a model of ethnic hybridisation of various groups descending in the valley at different periods of history. Religious affiliations don't present a clear picture of either ethnicity or sequent occupance. Many of the early Mongoloid groups, initially perhaps without an established religion, were converted to Hinduism, particularly after the fifteenth century, and many others embraced Christianity during the last 150 years. Some other groups adopted Buddhism in close proximity to Tibet.

The large number of tribes in North-East India represents groups and subgroups depending on the chronology of their arrival, their adaptation to local environment conditions and division because of distance and adoption of a variety of names to give them a clear identity. The major ethnic groups and areas of their occupation can be defined on the basis of linguistic roots. Since the genomic analysis of the population for North-East India is not available, language appears to be the one criterion to establish major groups (Fig. 10.1).

10.2.1 Linguistic Divisions and Their Spread

Following Grierson's (1905) *Linguistic Survey of India*, Chatterjee (1950) elaborating on Grierson's scheme grouped the languages of the North-East into two main branches:

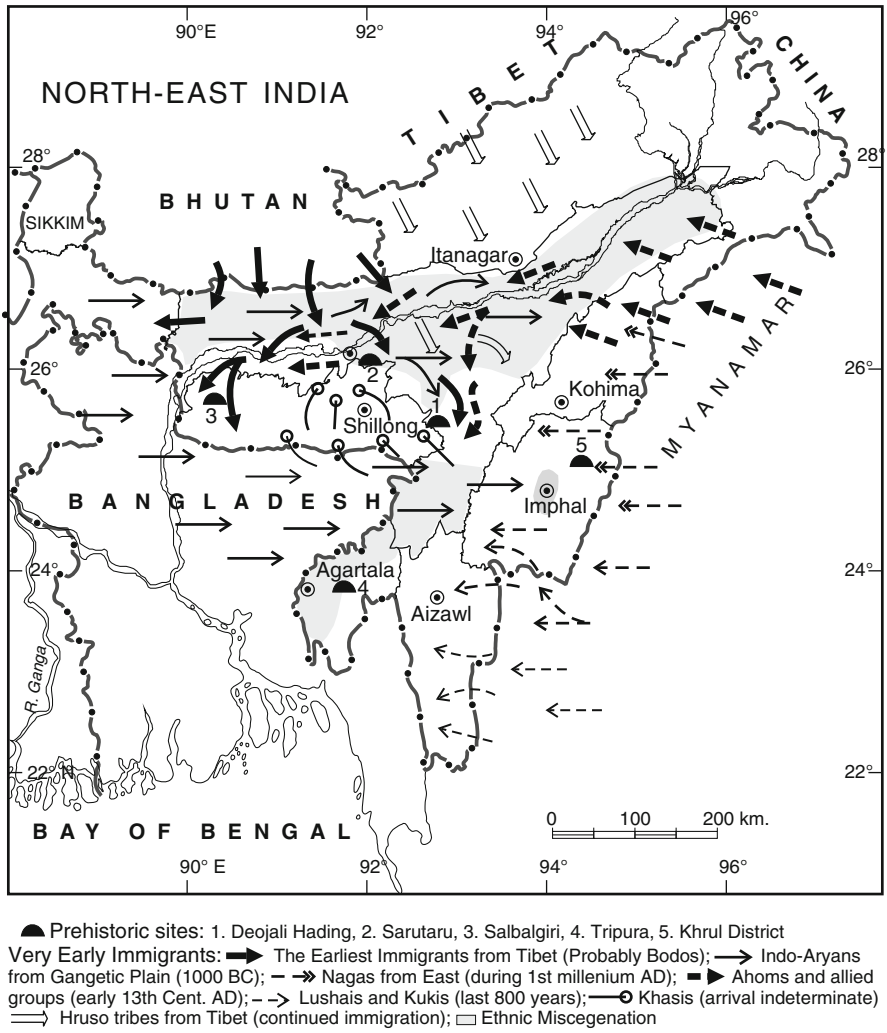

Fig. 10.1 Traces of early humans and paths of early migration in North-East India

1. Tibeto-Burman
2. Siamese Chinese

1. The Tibeto-Burman group was further divided into four subgroups:

   (a) Tibetan and its various dialects spoken in Tibet
   (b) Himalayan group of dialect, usually spoken on the Indian side of the Himalayas
   (c) The pronominalised Himalayan dialects, spoken in the western Himalayan region

(d) North Assam group of Tibeto-Burman speech, like Aka, Hrusso, Miri, Abor, Dafla and Mishmi spoken in Arunachal Pradesh
(e) Tibeto-Burman speech of North Bengal and Assam (Assamese–Burmese group). These include:

(i) Bodo speech

(a) Bodo
(b) Mech
(c) Rabha
(d) Garo
(e) Kachari
(f) Tipra
(g) Modified form of any one of these

(ii) Naga dialects

(a) Ao
(b) Angami
(c) Sema Tungkul
(d) Sangtam

(iii) Kuki–Chin speeches

(a) Manipuri
(b) Tripura
(c) Mizoram
(d) Meitei–Manipuri

2. Siamese–Chinese speech

(a) Tai or Dei or Siamese
(b) Chinese

In India, Tai is spoken by only a few groups of people like the Khamtis and Ahoms. Tai as a language brought by the Ahoms is virtually dead and is preserved by only a few academically inclined people.

The subgroups of languages which are spoken in North-East India are:

1. North Assam group of Tibeto-Burman languages spoken in Arunachal as mentioned (d) above
2. Tibeto-Burman speech of Assam and North Bengal

(a) Bodo group
(b) Chin–Naga–Kuki Lushai group

3. Austric group, Austro-Asiatic spoken by the Khasis and Syntengs

On the basis of these groups and subgroups of languages, North-East India is divided into different regions, and the strength of each group, their movement and areal spread are examined.

10.3 The Areal Distribution of These Linguistic Groups

One can visualise three main regional groups:

1. Peripheral mountainous group
   (a) Arunachal
   (b) Nagaland, Manipur, Mizoram group
2. Central Assam and Tripura group
3. Distinct Khasi group

10.3.1 Peripheral Mountain Group

The *Arunachal group* of Tibeto-Burman languages including the Aka, Hrusso, Miri, Abor, Dafla and Mishmi language and their speakers appear to have arrived late on the scene and are confined to the territory north of Brahmaputra. Of these, the most important group, and perhaps the earliest to arrive, is that of Miris that reached as far as the Brahmaputra and even beyond to the south. All other groups were numerically small. The Census of Bombay, India 1891, counted a small number of these tribes, though it must be admitted that most of the speakers of these languages lived outside the British territory in the closing years of the nineteenth century. The Arunachal dialects can roughly be described as Tibeto-Burman form of speech, intermediate between Tibetan and the dialects spoken in Assam and further India. Highly scattered and isolated, the speakers of these languages don't even add up to a million over an area of over 80,000 km^2. They have not spread out much beyond the area of their early occupation and are a late addition to the total population of North-East India with a minimal impact on the life and culture of the people of the Brahmaputra valley or beyond. They still practise a primitive mode of cultivation and it is only very recently that the state initiative has enabled them to come out of their isolation, adopting better practices of horticulture and utilisation of the land.

10.3.1.1 The Eastern Mountain Region

The second peripheral region is the eastern mountain region. India's eastern frontier bordering Burma is a mountainous zone with a series of parallel and sub-parallel chains of mountains, sometimes 3,800 m in height. The Nagas, the Kukis and the Manipuris in the centre and the Mizos in the south come into this category. The region, clearly demarcated from Brahmaputra valley by escarpments, and badly dissected, isolates them further. Nagaland, Manipur and Mizoram apparently speak different languages, but they are allied. Even culturally, leaving the Meitei population of Manipur, much of the eastern board of India is dominated by Naga–Kuki–Mizo tribes, which have been for long, confined to this hilly region. Some of these groups

with their predatory habits have made forays in the plains of Cachar, North Cachar Hills and Dhansiri valley, but have not moved away permanently from their hilly domain. Occasionally, these hill tribes have taken people from the plain and enslaved them, adding to their manpower supply. A case in point is the population of Reangs, about 40,000 of which were whisked away by the Mizos in successive raids to be returned only after Mizoram became part of the Indian Union. Now there are 34,000 refugees in Tripura. Similarly, sometime in the past, under attack from the Burmese side, Manipur people fled their home and settled in Cachar. Thus, these people speak Manipuri in an otherwise Assamese- and Bodo-speaking Cachar. The plundering forays of the Nagas in history are well known. All these, however, were transient or episodic migrations, but a large-scale planned migration of the tribal groups from the hilly region did not take place. If at all, some north–south migration along the intermontane valleys may have taken place, resulting in intertribal warfare, as it happens even today, between the Kukis and Nagas in Manipur.

Though the people of the eastern mountainous region like Nagaland, Manipur and Mizoram speak a dialect of Tibeto-Burman group, these have evolved differently and the speakers of these languages have settled in their present habitat at different times.

The Naga group, wedged between the Kuki–Chin dialect in the south and Tirap and Assam north of the Brahmaputra, comprises a long series of dialects which differ from each other, but these are more closely related to Tibetan (Grierson, Vol II, pt. I:11). In the south, the Naga group is connected with Kuki–Chin group. The word 'Kuki' is more specially used to denote the tribes, which have been successively driven from Lushai and Chin hills into the surrounding country to the northwest. The tribes, which emigrated from Lushai Hills into Cachar like the 'Rangkhols' and 'Betes', are generally called Old Kukis, while it has become customary to use the term New Kuki to denote the Thados, Jongshens and their offshoots. These latter tribes had the so-called Old Kukis out of Lushai land, but were themselves afterwards driven out subsequently by the Lushais.

The word 'Chin' is of Burmese origin used to describe the hill tribes living in the mountainous country between Burma and the provinces of Assam and Bengal.

10.3.1.2 The Sequence of Arrival of the Eastern Tribes

The entire mountain region of the eastern part of North-East India is inhabited by people speaking the Tibeto-Burman language, but the sequence of their arrival in their region is not very clear.

It is speculated that the most settled groups must have arrived, settling after a series of shifts and finding a suitable area for their permanent settlement, in terms of safety and economic security. Such people have developed their own culture, art and even literature. It is generally believed that the Meitheis were settled in the Manipur valley (Imphal valley) more than thousand years ago. In fact, the community claims to have a history of at least 2,000 years. Manipur chronicles, though not authenticated, nor widely accepted among historians, claim a royal genealogy of about 2,000 years.

The pretended antiquity may not be substantiated, yet the fact remains that of all the North-East states, Manipur is the only state to have a script and literature of its own besides the Assamese, the main Indo-Aryan language in the North-East of India. The valley of Manipur – not the entire state of Manipur – may have been settled at the same time as the Brahmaputra valley, or even earlier, having greater contact with Burma than with India. The historical annals of the state of Manipur – no longer a princely state – commence with the 30th year of the Christian era (Dalton 1872:49), suggesting the antiquity of the settlement and the people.

The remaining Kuki–Chin tribes including the Nagas lived in a nomadic state for centuries before settling in semi-permanent and finally permanent villages. This is clear from marauding tendencies these groups demonstrated before the advent of the British rule in late nineteenth century. Notwithstanding the distorted reference to Nagaland in the writings of Ptolemy, their occupation of the Nagaland may not be very early. They were certainly not too well organised when the Ahoms descended into the Brahmaputra valley in the early thirteenth century.

As for the Mizos, they appear to have settled in Lushai Hills not earlier than 400 years ago, and only after settling in Lushai Hills, they developed the characteristics of their language.

In the eastern hilly region, the speakers of different dialects of the Tibeto-Burman language appear to have crossed over to none-too-fertile hills of the eastern hilly region from Shan plateau under pressure from other Burmese tribes. These groups did not diffuse widely and remained confined to the hilly region with hunting and practising a primitive kind of agriculture. Much of the development, cultural and technological, that is seen in this region is not older than a century and half. The Nagas, in the northern part, settled around 1000 A.D., with Kukis and Mizos and many associated groups appearing 300 or 400 years ago.

10.3.2 The Bodo Linguistic Group

The Bodo, the most important and most widely spread Tibeto-Burman linguistic group, has primacy over other linguistic groups of Tibeto-Burman languages. The speakers of this group are spread from the Himalayan foothills in the north to the plains of Cachar in the south and from the easternmost part of Assam to Koch Bihar in northern Bengal.

Leaving aside the Nagas, the Manipuris, the Kukis and the Lushais or Mizos on the east and the people of the sub-Himalayan region north of Brahmaputra, much of the North-East is occupied by the speakers of ‘Bodo’ and other ‘allied’ dialects. Besides the Bodo-speaking people, there is yet another group which merits inclusion in the discussion of early colonisation in the North-East. And this is the group of Khasi-speaking ‘Khasis’ and ‘Syntengs’ occupying roughly 60 % of the plateau of Meghalaya, positioning themselves in the eastern part of the plateau, juxtaposed to the Garos speaking a language akin to Bodo and settled in the western part of the plateau.

10.3.2.1 The Bodos

The Bodos or Bodo-speaking people are the oldest, the most widely spread and the most numerous in the population of the North-East. Having adopted Hinduism, they are unrecognisably changed over the centuries and are known by different names in different areas speaking varying dialects rooted in the original Bodo. Most Bodos, however, are bilingual. Having lived with the Indo-Aryan group that arrived from the Gangetic plain and dominated the area for over a thousand years, they speak Assamese, the official language of the region besides a regional dialect of the Bodo language.

The ethnic groups discussed earlier, either of Arunachal, the sub-Himalayan region, north of Brahmaputra or of the eastern mountainous region like the Nagas, Kukis and Mizos, arrived on the scene later than the Indo-Aryans and could not penetrate the already colonised areas of Brahmaputra valley or Cachar region and remained isolated in the mountain habitat, with a very low population growth caused by scarce resources, internecine conflicts and diseases. By the time these groups arrived, the 'Bodos' under different names were widely diffused and well established.

10.3.2.2 The Origin of Bodos

The origin of the Bodo-speaking people, though uncertain, can be guessed by their present distribution and spread, though one would agree with Chatterjee's remark that (1950:154) the history of the arrival into India of the various Mongoloids groups speaking dialects of some Sino-Tibetan speech family is not known, nor have the various languages and dialects in the family been satisfactory classified. Chatterjee dates the arrival of the Mongoloid people in the North-East to tenth century B.C. The history of the Indian subcontinent from 1200 B.C., the outer limit of Indus valley civilisation, till the appearance of the Vedic people, is uncertain and falls in the domain of pre- and proto-history, in which it is difficult to connect civilisation, people and their literature.

In the context of the origin of the Bodos, a few facts that strike an observer are as follows (Table 10.1):

1. The Bodo-speaking people are the most widespread, occupying much of the Brahmaputra valley, Cachar, Tripura and even North Bengal.
2. Their concentration is more towards the western part of the North-East region, especially the western part of the Brahmaputra valley. This shows their origin somewhere in the western part of Tibet.
3. Early in the twentieth century, Grierson noticed that headquarters of Bara language are the three districts of Assam valley – Darrang, Nowgong and Kamrup – and it extends westward through Goalpara, Jalpaiguri and Koch Bihar under the name 'Mech' (Grierson 1905, vol. III, pt. II:5).
4. The Bodo group has the largest percentage in the Tibeto-Burman family of languages in the North-East.

As can be seen, the Bodo group is the largest though its numerical strength appears less than Kuki–Chin group, which takes the Meitei-speaking group and the entire Kuki–Lushai clan and their extension into Burma.

Table 10.1 Linguistic groups in North-East India in 1901

	As estimated in the *Linguistic Survey* by Grierson		As per 1901 Census of India	
Group of languages	Total no.	Percentage	Total no.	Percentage
Tibetan	45,024	2.56	234,229	11.36
Himalayan	194,234	11.08	190,585	9.24
N. Assam	36,910	2.13	41,731	2.02
Bodo	617,989	35.25	596,411	28.94
Naga	292,799	16.70	247,780	12.02
Kachin	1,920	0.11	125,755	6.10
Kuki–Chin	564,091	32.17	624,149	30.28
Total	1,752,967		2,060,640	

Source: Grierson (1903, *Linguistic Survey of India*, vol. III, pt. I:1)
Notes:
1. Burmese language is dropped from the table
2. Kuki–Chin languages also include Meitei spread in Burma, and their number includes a large segment of Burmese population

10.3.2.3 The Numerical and Spatial Spread of 'Bodos'

The extension of Bodo linguistic group, called also the 'Bara group' of dialects, which comprises the 'Bara-f-sa' (i.e. Mech and Kacharis) and cognate languages spoken by other tribes, is indicated by the areas of different tribes (Table 10.2). In early part of the last century (1905), the speakers of Bodo and its cognate languages as revealed in the *Linguistic Survey* were 617,989, which closely agrees with the census figure of 596,411 (Census of India 1901).

The total population of Assam in 1901 including Lushai Hills (present Mizoram), Naga Hills (western part of Nagaland) and Manipur, Khasi, Jaintia and Garo Hills and North Cachar Hills was 6,126,343. To seek the dominance of the Bodo group, one can, with enough reason, exclude the population of Nagaland, Manipur, Lushai Hills and Khasi and Jaintia Hills, which represent the hilly and inhospitable eastern border and the single tribe territory of the Khasis. Also from the realm of Assam can be excluded the Bengali-speaking district of Sylhet which, in reality, represented the extension of Bengal and was transferred to Pakistan (now Bangladesh in 1947, as a result of partition of India). The population of these districts in 1901 was as follows:

Sylhet	2,241,848
Lushai hills	82,434
Naga hills	102,402
Khasi and Jaintia hills	202,250
Manipur	284,465
	2,913,399

Source: Census of Assam (1901, Vol. IV, Pt. II, Table I)

Table 10.2 Speakers of Bodo and cognate languages and the area of their occurrence in 1901 as estimated in the Linguistic Survey by Grierson

Tribal linguistic group	Number in Assam	Areas of their occurrence	Number in Bengal	Total	In percent
True Bora and Kacharis	247,520	Darrang, Nowgong, Kamrup, Goalpara, Jalpaiguri, E. Assam, Koch Bihar and other parts	25,011	272,531	44.10
Rabha	31,370	In districts of Assam west of Kamrup, some also in Darrang	–	31,370	5.07
Lalung	40,160	Largely concentrated in Nowgong and some in Kamrup	–	40,160	6.50
Dimasa (hill Kacharis)	18,681	Karbi-Anglong, N. Cachar Hills	–	18,681	3.02
Garo	120,780	Garo Hills	28,313	149,093	24.12
Tripura	300	Tripura	105,550	105,850	17.12
Chutia	204	NE Assam	–	204	0.05
Total	459,115		158,874	617,989	
In percent	74.29		25.70		99.98

The population of Assam, leaving aside the population of the above districts is (6,126,343–2,913,399) 3,212,944 persons. This also includes Garo Hills, which though presently not in Assam has a large population of Bodo origin. It appears that put together about one-fifth of the total population of Assam was of known Bodo ancestry.

There is no ethnic group numerically as strong as the Bodos. The entire population of eastern margin of the region excluding Nagas, Lushais and Manipuris will be just equal in number to the number of Bodos in the population of Assam, spread widely like a fan-like delta from the foothills of Bhutan, which, the present writer believes, may have been the diffusion point from where they gradually spread in all directions.

During the last quarter of the nineteenth century, at the time of the first census of the country in 1881, Bodos as an ethnic group were the largest community and formed about 35 % of the total population. The population of this group existed under different religious denominations. These comprised those uninfluenced by Hinduism numbering 396,442, a small number in the process of conversion 82,889 and a large group fully converted to Hinduism with 386,233 persons. The total population of Bodos as provided by the 1881 Census of Assam is as given in Table 10.3. Added to this is the population of Garo Hills (88,731) and 19,752 persons, which the Census of 1881 classed as ‘some sorts of Baro’. Thus the total Bodo population in Assam in 1881 was 983,716 persons.

In this total, if the Garos of the Garo Hills and those who are some sorts of Bodos are included, the number swells to almost a million. The total population of Assam as mentioned earlier was 4,881,426 in 1881 including the population of Sylhet, Khasi and Naga Hills. If the population of the last three peripheral areas is

Table 10.3 The population of Bodos in 1881

Category I: Uninfluenced by Hinduism		Category II: Bodos in the process of conversion		Category III: Wholly converted	
Name of tribes	Population	Name of tribes	Population	Name of tribes	Population
Kacharis	265,418	Rabha	56,285	Chutias	50,163
Mech	57,885	Madhai	13,149	Koch and Rajbanshis	336,739
Lalung	46,077	Mahalia	6,198		
Hajong	3,689	Sarania	4,718		
Garo (plains)	23,373	Totila	2,539		
Total	396,442	Total	82,889	Total	875,233

Total of Bodos in 1881	875,233 persons
Garos of the hills	88,731 persons
Some sorts of Boros	19,752 persons
Total no. of recognised Bodo population in 1881	983,716 persons

deducted, for reasons of their being single ethnic non-Bodo community area, the population of Assam in 1881 is reduced to 2,649,177, of which the Bodo component was 37.13 %.

The areas of the largest concentration of Bodos in Assam have been the middle and western parts of Brahmaputra valley, consisting of the districts of Darrang, Nowgong, Kamrup, Goalpara extending into Jalpaiguri and Koch Bihar districts of Bengal. The Chutias exist under different names as they migrated from their cultural hearth in the Duar region, the foothills of Bhutan, to the trans-Brahmaputra region of Eastern Assam. The Bodos are known as Dimasas or hill Kacharis in North Cachar Hills, Rabha in the areas west of Kamrup, Lalung in Nagaon, Garos in Garo Hills, Tripuri in Tripura and Chutias in Sadiya area of North-East Assam. The Bodos who are not converted to Hinduism are largely concentrated in the submontane tract, suggesting that for the original Bodos the preferred sites for habitation were in the submontane region, but as they learnt better art of farming, they spread to other areas. Today, the submontane belt extending from Kokrajhar to Darrang district is the core area of Bodo habitat.

Before we discuss the actual sequence of occupance of the region, Khasis, an important group in the population of the North-East, need to be considered.

10.3.3 The Khasis

Looking at the Khasi-Syntengs linguistically, they form an island of Mon–Khmer (Austric or Austro-Asiatic) speakers within the original Bodo area. They are by race Indo-Mongoloid, but their language is different (Chatterjee 1950:173).

Grierson (1905), in a more instructive analysis of the Mon–Khmer family of languages, believed that 'incursions from the north, of the tribes speaking Tibeto-Burman languages and in later time from China of the members of the Tai race have driven most of the Mon-Khmer speakers to the seacoast, so that, with a few exceptions, all the languages of this family are now found in Pegu, Cambodia or Anam. The exceptions are some tribes who still hold the hill country of the lower and middle Mekong and the middle Chindwin, and the KHASIS, all of whom are islands of Mon-Khmer origin' (Grierson, vol. II:1). Grierson divided the Mon–Khmer family of languages in five groups, the last one with which we are concerned are the various dialects of the Khasi language.

A few facts which are obvious are:

1. The Khasi language and its dialects and their speakers are confined, like an island, in eastern Meghalaya, inhabited by the Khasis and Jaintias (the Syntengs), around Shillong, Cherrapunji, Jowai and Jayantipur, the last one in Bangladesh.
2. The Khasi group speaks an Austric language which is similar in vocabulary to the Munda language of Central India and the Nancowry language of Nicobars and even of the dialects of the early inhabitants of Malacca; only the structure of the language varies. But, besides the difference in the structure of the languages, there is at the bottom a common substratum.
3. Thus, widely divergent groups, speaking a language similar in vocabulary, suggest a common origin.

10.3.3.1 The Origin and Arrival and Settlement of Khasis

The Khasis neither multiplied in substantial number nor spread areally. In fact, they appear to have remained confined to the Meghalaya plateau and the northern and North-East margin of Bengal plain, where they left a trail of their migration to the plateau. What is noteworthy in the form of Khasi settlements is that the Khasis have not spread towards Brahmaputra valley confining themselves to the hills and avoiding confrontation with the ruling dynasties or even farming communities in the plains. This stands in sharp contrast to the Nagas and Mizos of the eastern mountain fringe, who frequently raided the plains of Cachar.

It is difficult to surmise even approximate date of the arrival of this group on Meghalaya plateau. What is certain is that they came in successive stages leaving a trail of Khasi-speaking people in Sylhet plain down the southern limit of Meghalaya plateau. Since the Mundas of Central India and some of the Nicobaris belong to the same linguistic group, it is strongly possible that they all came from the Malacca islands, the early inhabitants of which spoke a similar language. That the Khasi group moved along the Burmese coast or came in boats is not certain, but what is certain is that they passed over eastern Bengal, the present Bangladesh from where they were uprooted and had to gradually move north, till they encountered the formidable scarp of Meghalaya, climbed over it and experienced a measure of security.

Used to rainy climate, the rains of Meghalaya did not trouble them, and they continued pig rearing, hunting and practising primitive agriculture. If the Brahmaputra valley or the plains of Cachar were not populated, they would have certainly moved along the Surma-Barak river to the Cachar plains or even descended down the northern slope of Meghalaya to the plains, but once on the plateau, they remained frozen, glued to their traditional occupation of survival.

10.3.3.2 The Siamese–Chinese Family: The Tai Group

One group of the Siamese–Chinese family is represented by the Tai group, a group which has several divisions like the Shans, the Ahoms, the Khamptis and the Pakhials. People of these groups, particularly the Ahoms and the Khamptis, arrived in Assam only in the thirteenth century. The Ahoms captured virtually the entire Brahmaputra valley and became the ruling dynasty, but in no measure, they could be called early colonisers. They ruled Assam, the state known after them, for six centuries, adopted Hinduism and got integrated in the local population, yet represented the super-crust of the Assamese society. They exerted considerable influence and promoted development work for centuries, to colonise the inhospitable terrain of the Brahmaputra valley and the adjacent regions.

10.3.4 The Claims of the Bodos Versus Indo-Aryans as the Earliest Settlers

There are contrasting views on the question of who colonised Assam first. Edward Tuite Dalton while writing the 'Tribal History of Eastern India', an assignment given to him by the Asiatic Society of Bengal, while discussing the 'the great antiquity of Hindu race in Assam' wrote: 'It is by no means improbable that they occupied the fairest portion of it – the lovely Daphian region from Dhubri to Bishnath before it was discovered by Mongolians or Turanian tribes'. Dalton appears to have accepted the early incursion of the Indo-Aryan fold confined to a small strip of flat land from Dhubri in the west to Visnath (Viswanath, near Tezpur), before the Mongolians, particularly the Bodos, descended.

This appears to the present author a highly improbable proposition. An analogy can be drawn with the ancient kingdoms of the Ganga plain like the Ayodhya and Magadha kingdoms, which lay just south of the Himalayas. But these ruling dynasties did not allow any large-scale migration of the Mongoloid population to descend from across the Himalayas or even from the foothills to penetrate their kingdom and swamp the entire area by their numerical superiority. If the Indo-Aryan preceded the Bodos, the latter's arrival and their rapid spread could have been restricted.

Though 'Bodos' are not a caste group associated with Hindu religion, they are identified with the help of the language they speak, as seen earlier. Their number is

Table 10.4 Comparison of the population of Bodos with other Hindu castes

Caste group	Number in 1881
Bodos	983,716 (includes 'Bodos' of all categories and includes Koch and Rajbanshis)
Kalitas	241,589
Shan tribes	182,441 (includes Ahom, Khampti and Shan)
Brahmins	119,075 (includes 45,434 Brahmins of Sylhet)
Kayasthas	185,561 (includes 157,130 Kayasthas of Sylhet)
Kewat	104,275
Chandal (Changa)	173,532 (mostly in Sylhet district)
Das	102,426 (mostly in Sylhet district)
Katani	59,847

Source: Census of Assam, table III, Government Printing Press Calcutta, 1903

Table 10.5 Population of four dominant groups in Sylhet and the rest of Assam

Groups	Population in Sylhet	Population in the rest of Assam	Maximum concentration districts
Bodos	Nil	646,977	Goalpara,[a] Kamrup, Darrang, Nowgong
Kalitas	12,210	231,650	Kamrup with a population of 140,923
Brahmans	45,434	73,641	Sylhet with the highest number and Kamrup with the second highest number
Kayasthas	157,130	28,431	Excessively concentrated in Sylhet
Kewat	Insignificant	104,275	Concentrated in Brahmaputra valley

Source: Census of Assam, table III, Government Printing Press Calcutta, 1903
[a]Goalpara district of Assam in 1881 included the entire western part of Assam, west of Kamrup and Darrang

compared with the more permanent castes of Assam only to show their dominance. They are more numerous than any other caste (Table 10.4).

The caste composition of Assam falls into two categories:

1. Assam category
2. Sylhet category

In Assam category all such castes as were converted from tribal population or those who came as migrants have the numerical superiority, whereas in Sylhet the caste composition represents a millennium old Hindu order well entrenched in the plains of Bengal of which Sylhet is a typical case. The large population of Brahmans and Kayasthas in Sylhet and their relatively small number in the rest of Assam speaks of their being part of the ancient Hindu fold (Table 10.5).

In Brahmaputra valley, on the other hand, the number of Brahmins and Kayasthas is relatively small.

This shows that though apparently the caste Hindus appear to dominate Assam, it is essentially because of Sylhet district, which was an extension of Bengal plain and occupied by Indo-Aryan fold. The numerical superiority of Bodos vis-à-vis

Kalitas or for that matter any caste in Assam valley suggests that Bodos were the first to arrive on the scene and remained confined north of Meghalaya. In fact, The Meghalaya plateau was the great divide for centuries between the tribal realm of Assam dominated by Bodos and fully developed caste society inhabiting the Bengal plains, before they were occupied by Muslim rulers, moving from Punjab and Delhi.

This indicates that the Aryanisation of Assam started with the eastern extension of Bengal in what is known as Sylhet.

10.3.5 The Antiquity of Indo-Aryan Arrival in Assam

The early history of Assam is shrouded in traditions, legends and Puranic tales, the epics of Mahabharata and Ramayana getting some clarity only from sixteenth to seventeenth century. There is no better account of the sources of the early history of Assam than 'The History of Civilisation of the People of Assam to the Twelfth Century AD' by P. C. Choudhury, a London Ph.D. dissertation, which has undergone several editions, the last being in 1986, and many reprints. The book devotes an entire chapter on the 'sources' of the history of Assam. Other works like Barua K. L. (1933) *Early History of Kamarupa from the Earliest Times to the End of the 16th Century*, B. K. Barua's (1951) *A Cultural History of Assam*, S. K. Chatterjee's (1950) 'Kirata Janakriti' and finally the first volume of H. K. Barpujari's *Comprehensive History of Assam* together adequately inform a reader about the early history of Assam.

Choudhury has, by implication, tried to show that Kamarupa was known to the Gangetic valley Aryans during the Brahmana period, alluding its reference in Gopath and Aitaraya Brahman (Choudhury 1959:9), but the first clear reference to Kamarupa or Pragjyotishpur is seen in the two epics, i.e. 'Mahabharata' and 'Ramayana'. There is a disagreement about the date/period when these epics were compiled. The nearest approximation for Mahabharata is expressed by Winternitz (1981) when he says 'Mahabharata can have received its present form not earlier than the 4th century B.C. and not later than in the 4th century A.D.'. As for Ramayana, it is believed to have been composed by Valmiki in the fourth and third century B.C. What is important in this connection is that the 1st and 7th cantos of Ramayana are believed to be of much later edition: One might conclude that Kamarupa and Pragjyotishpur were known at least as early as fourth century A.D. There are far more references to Kamarupa and Pragjyotishpur (Pargiter 1897). The mention of Bhagadatta and Pragjyotish in Mahabharata, the text compiled between 400 B.C. and 400 A.D. (Winternitz 1981), and many other kings and kingdoms in other parts of the country including the kingdoms in the extreme southern region of India only suggests that Kiratas, Cinas and Pragjyotish were known to the composer/composers of Mahabharata; that they were contemporary to the Mahabharata war that took place around 1000 B.C. is highly questionable. Similar reference relating to Narka's city of Pragjyotish occurring in Ramayana (fourth to third century B.C.), in Adikand and in Kiskendhakand is suggestive of the fact that by fourth century BC, Pragjyotish as a kingdom and Pragjyotishpur

Table 10.6 Early inscriptions and copper plates of historic significance in Assam

Name of the inscription/ plate/grant	Location	Age	The grantor kings
Umachal rock inscription	Kamakhya Hill Guwahati	Sixth century A.D.	Surendravarman
Badganga inscription	Nagaon district, near Devaka	Sixth century A.D.	Bhutivarman performer of Asvamedha sacrifice
Dubi (Doobi) copper plate grant	Village Doobi near Pathsala railway station in Barpeta district	Early seventh century A.D.	Kumar Bhaskarvarman
Nidhanpur grant	Village Nidhanpur, Sylhet district of Bangladesh	Seventh century A.D.	Bhaskarvarman who reissued the grant made by his predecessor Bhutivarman
Three Naland clay seals	Nalanda in Bihar	–	Provide the genealogy of Bhauma-Barman dynasty
Tezpur rock inscription of Harjaravarman	Dhenukana Parbat west of Tezpur	829–30 A.D. The date is given in Gupta era 510	The first dated inscription of Assam
Hayunthal copper plate of inscription of Harjaravarman	Hayunthal in Nowgong district	Mid-ninth century	It makes reference of Mleccha dynasty with Salastambha as its first king

were known to enlightened people of Madhyadesa, coinciding with the Ganga plain. Subsequent references, range from Brihat Sanghita of Varahamihira (fifth century A.D.) that refer to Pragjyotish and Lauhitya to those of Kalidas's Raghuvamsa describing Pragjyotish and Kamarupa laying to the east of Brahmaputra. By the seventh century the kingdom of Kamarupa was well established as seen in Harsh Charit of Banabhatta dated to early seventh century.

10.3.5.1 The Inscriptional Evidences of Early Colonisation

The historians of Assam are on a more unassailable ground once they enter the period of inscriptions and copper plates carrying grant deeds found in different parts of western Assam. Some of the early rock inscriptions and copper plates that merit attention are mentioned to indicate the antiquity of the Aryan arrival in Assam (Table 10.6).

Besides the above-mentioned inscriptions, there are several others ranging in age from fifth to twelfth century that are found scattered largely in western Assam. There are many other epigraphs, pieces of architecture, sculpture and images that throw light on early colonisation of Assam. The earliest specimen of the remnant of a temple is found in Dah Parbatiya (Tezpur), ascribed to the fifth century A.D. (Choudhury 1959:23).

The purpose of mentioning some of these early inscriptions is to show the antiquity of Indo-Aryan arrival in Assam. The earliest historic reference to Kamarupa is undoubtedly the Allahabad Pillar Prasasti of Samudragupta which mentions the frontier kings of 'Kamarupa' and 'Devaka'.

10.3.5.2 The Establishment of Indo-Aryan Rule in Assam

Nothing suggests the advent of Indo-Aryan in Assam before fourth century A.D. The mention of Kamarupa and Pragjyotishpur in Mahabharata suggests their existence at the time these texts or their parts were composed. In view of the sketchy references, one is on surer ground in taking Allahabad Prasasti of Samudragupta of fourth century as the earliest benchmark when the region experienced the rule of some Indo-Aryan. Barua (1951), however, believes that king Naraka established himself in power in Pragjyotish sometime between 200 and 500 A.D., and Bhagadatta who was the son of Naraka was killed in Mahabharata. This is perhaps based on a Tantric Sanskrit text called '*Hara-Gauri-Sambada*' of 1800 A.D., which gives a genealogy of Assam kings. As remarked by Choudhury (1959/1987), the kingdom was not ruled by the aboriginal or Mongolian chiefs. The first foundation of the political rule can reasonably be attributed to the Alpines. The crux of the problem is not whether the first rulers of Kamarupa were Indo-Aryans or Mongoloid people; what is relevant is to understand who the first to colonise the territory were. The Indo-Aryan migrants from the Gangetic plain did not occupy a wasteland and developed it; they occupied a land that was already humming with human activity. The kingdoms of these early monarchs of 'Barman' dynasty were relatively small and inhabited by Mongoloids, the 'Kiratas' of Mahabharata and who also formed part of the army of these early rulers.

It is clear that before the Indo-Aryans arrived from the mainland, there was a migratory as well as a settled population of Mongoloid people, most probably ancestors of present 'Bodos' of the lower Brahmaputra valley. The archaeological evidences so far do not suggest great antiquity for the Neolithic people, and there could be contemporaneity between the slash and burn cultivators of Garo Hills and advanced cultures of Indo-Aryan people after their arrival.

The dominance of Bodos in the population of Assam suggests that they have been there even before the arrival of the Indo-Aryans whose number swelled in due course as the Bodos adopted the faith and lifestyle of the invaders from the Gangetic valley

10.4 The Origin and Sequence of Events

The present author thinks that the Bodos arrived in Assam valley from Tibet. 'The Tibetans themselves call their country "Bod-yul" and their language "Bod-skad", pronounced "Boka" in Central Tibet. A Tibetan is Bod-pa and this word has been changed

to Bhotia etc. by the Hindus' (Grierson 1903, vol. II, pt. I:14). There is nothing that restrains from hypothesising that there must have been several streams of Tibetans who migrated to Sikkim and Bhutan besides the 'Bhotia'. The similarity of the word 'Bodo' and Bod-pa suggests that 'Bodos' represent very early migration to the foothills of Bhutan, which remained a significant area of their concentration in the mid- or late nineteenth century. Even today, there is a concentration of Bodos in the northern part of the districts of Assam west of Guwahati. Writing about Bodos in 1872, Dalton remarked 'they are the most numerous and widely spread of tribes… they are seldom found on higher elevations, preferring to live amongst low hills on the skirts of higher ranges or on alluvial flats. Many of them are completely fused with the mass forming the Hindu-Assamese population, living like Hindus under the shade of ancestral fruit trees and pursuing the same system of permanent cultivation; the majority cling to their nomadic habits, dwelling always amidst new clearings and supporting themselves chiefly by hoe and hand cultivation of virgin soil'.

The Bodos, living in upper Assam in the nineteenth century, known as 'Soronia', i.e. purified Kacharis, were converts to Hinduism who migrated upstream along Brahmaputra. While the Bodos were changing to Hinduism in Assam, those under Tibetans were adopting Lamaism and, on conversion, call themselves Shargiah Bhotias.

10.4.1 Interaction Between Bodos and Kalitas

With the arrival of the people from the mainland, the Bodos interacted with the Kalitas who were the earliest agricultural communities from Indo-Aryan fold that arrived in Assam. In fact, Kalitas appear to be the only remnant of the early Aryan colonists. There people brought with them advanced agricultural technology, use of plough and better methods of cultivation. The Bodos, fast on the uptake, not only adopted modern means of agriculture, but also converted in large number to establish social parity with the Indo-Aryan groups and finally surpassed them, usurping the latter's royal position and establishing independent kingdoms.

The early colonisation of Assam was, undoubtedly, effected by the Bodos, who adopted modern methods of cultivation after coming into contact with the Kalitas, and spread over the entire length and breadth of Assam under different denominations, from Garos to Kacharis and Koch. The change in name indicated the shift in the area of occupation as well as the level of their conversion.

Before the Indo-Aryans arrived in Assam, around fourth century A.D., the Bodos were already established in the lower Brahmaputra valley. According to Chatterjee (1950), 'It would appear that their presence in India was noted by the 10th century BC, when Veda books were compiled'. This view of Chatterjee is unsupported by any archaeological including epigraphic or historical evidence. The large extension of the areas occupied by Bodos speaks for their antiquity. They existed in history in different moulds at different levels of civilisation and development. Some attained

royalty, as seen by Kachari kings of Dimapur, before the arrival of Ahoms, or of Koch Bihar later on, others remained in a primitive mode of existence as the Dimasas of Karbi-Anglong and the Garos of Garo Hills.

10.4.2 Changes Brought by the Arrival of the Indo-Aryans

The situation changed greatly after the arrival of the Indo-Aryans who brought with them advanced techniques of farming, a social organisation with a hierarchy caste system, better system of transport and the introduction of an established authority to which allowed allegiance. The colonisation of Assam was complete when the Ahoms, a Tai race, arrived in Brahmaputra valley in the thirteenth century. While the Indo-Aryan rule led to the development of western part of Assam with its economy, civilisation and culture, religious institutions, temples and architecture, the development of the region around Sibsagar can be attributed to the Ahoms, who arrived later.

10.4.2.1 The Khasis

About the Khasis, there are different views. Barua (1951:5) while talking of the sequence of arrival of different tribes suggests that 'the earliest inhabitants of Assam were speakers of Indo-Chinese language of Mon-Khmer family, the Khasis', which has been characterised by Schmidt as a member of the Austric family.

To the present author, the Khasis came after the Bodos, but before the Indo-Aryan group, and were spatially frozen on the Meghalaya plateau, hemmed in, as they were, by Bodos in the north and east and by a more advanced group of newly arrived Indo-Aryans on the west. The caste structure of Sylhet region in the nineteenth century with a predominance of Brahmans and Kayasthas suggests that the Indo-Aryans first arrived in the Surma valley, then later in the Brahmaputra valley in the north. The Khasis with their Mon–Khmer language arrived much after the Bodos but before the sway of the Indo-Aryans.

The Nagas, Kukis and Mizos of the eastern front are a late arrival and suffered from extreme isolation and lack of contact with advanced groups in western Assam. Grierson thought, on linguistic evidence, that with the exception of Meitheis who have been settled in Manipur valley for more than a thousand years: …*all the Kuki-Chin tribes appear to have lived in a nomadic state for some centuries. It seems that they settled on the Lushai and Chin hills during the last two* (now three) *centuries*; *and it is here that the chief characteristics of their language developed.*

The Nagas, on the other hand, may have arrived in their present territory before the Ahoms set their foot on Assam soil, as the latter are known to have perpetrated enormous and sometimes heinous crimes on the Nagas. The Nagas, known for inter-tribal or intervillage conflicts and head hunting, could have come at least a couple of centuries before the Ahoms to have organised themselves to put up a fight against the advancing Ahoms.

10.5 Summary

The first to enter Assam territory were the Bodos who descended from Tibet through Bhutan and settled in the foothills of Bhutan on exit points now known as 'Duars'. They practised shifting cultivation and led a nomadic life with hunting and fishing as main economic activities to support them. The Bodos spread rapidly seeking areas of lower hills and slopes and avoiding flood plains and low lands.

The Khasis and Jaintias arrived from south and remained confined to the central and eastern part of Meghalaya plateau, the physically lower and agriculturally more fertile western part was already occupied by the Garos.

The arrival of the Indo-Aryans caused a total transformation of the Assamese economy and society with improvement in agricultural techniques, better navigation methods and the emergence of a variety of professional classes. In course of times, conversion of the Bodo population led to a rapid growth of what was later recognised as the Hindu community. The Naga-Chins and Kukis arrived lately. The Nagas, it is speculated, should have been in the eastern hills much earlier, may be eighth or ninth century A.D., to be organised well enough to offer resistance to the advancing Ahoms who arrived in early thirteenth century. How the society developed is the subject of another chapter.

References

Barua KL (Rai Bahadur) (1933) Early history of Kamarupa from the earliest times to the end of the 16th century. Shillong (published by the author), 2nd edition in 1966 published by Lawyers Book Depot, Guwahati

Barua KL (1935) Kamrupa in the 9th century. J Assam Res Soc 3:2–5

Barua KL (1939) Prehistoric culture in Assam. J Assam Res Soc 7:35–41

Barua BK (1951) A cultural history of Assam. K.K. Barooah, Nowgong

Bhuyan GN (1993) Archaeology of Northeast India. In: Mehdi DK (ed) Man and environment in Northeast India. Onsons, Guwahati: 25–47

Bopardikar BP (1972) Prehistoric investigation – Daphabum (NEFA). In: Deo SB (ed) Archaeology congress and seminar paper 1–8, p 115, Nagpur

Brown JG (1914) Grooved stone hammers from Assam and the distribution of similar forms in eastern India. J R Asiat Soc Bengal X:107–109

Census of Assam (1881) Report. Government Printing Press, Calcutta

Census of Assam for 1891 (1891) Parts I & II. Superintendent of Government Printing Press, Calcutta

Census of India (1901) Assam, vol IV, pt. II, table 1

Chatterjee SK (1950) Kirata Jana Kriti, the Indo-Mongoloids: their contribution to the history and culture of India. J R Asiat Soc Bengal 16(2):22, Calcutta

Choudhury PC (1941) Neolithic culture of Kamarupa. J Assam Res Soc 9(1–2):1–47

Choudhury PC (1959/1987) History of civilization of people of Assam to 12th century AD. Spectrum Publication, Guwahati

Dalton ET (1872) Descriptive ethnology of Bengal. Reprinted 1978, Cosmo, Delhi

Dani AH (1960) Prehistory and protohistory of Eastern India. Firma L Mukhopadhyay, Calcutta

Ghosh A (ed) (1989) An encyclopaedia of Indian archaeology, vol 2. Munshiram Manoharlal, New Delhi

Godwin-Austen HH (1875) A celt found at the Khasi Hills. In: Proceedings of the Asiatic Society of Bengal. Shillong, pp 158–159
Gorman C (1971) The Hoabinhian and after. Subsistence pattern in Southeast Asia during the late Pleistocene and early recent period. World Archaeol 2:300–320
Goswami MC, Bhagabati AC (1959) A typological study of shouldered celt from Rengchangiri (Garo Hills). J Univ Gouhatl 10(2):105–122
Goswami MC, Sharma TC (1962a) On the Neolithic from the Garo Hills, Assam. J Univ Gouhatl 13(2):67–73
Goswami MC, Sharma TC (1962b) A brief report on the investigation into prehistoric archaeology of North Cachar Hills, Assam. J Univ Gouhatl 13:6–66
Grierson GA (1903&05) Linguistic survey of India. Mon Khmer family vol II, 1 and Tibeto-Burman Family, Bodo, Naga and Kachari Groups. vol III, pts. 1, 2 and 3 (1967) Motilal Banarsi Das, Delhi, reprinted
Hutton JH (1924) Two Celts from Naga Hills. Man XXIV(15):20–22, London
Hutton JH (1926) A Naga Hills Celt. J Asiat Soc Bengal 22:133
Hutton JH (1928) Prehistory of Assam. Man India 8(4):228–232
Lubbock J (1867) The stone age in upper Assam. Athenaeum, No. 2069:822, London
Medhi DK (1977) Some aspects of the quaternary studies in the Garo Hills, Meghalaya. Bull Deccan Coll Postgrad Res Inst, 37/1-4/1977-78: 71–78, Pune
Medhi DK (1980) Quaternary history of the Garo Hills, Meghalaya. Unpubl. Ph.D. dissertation, Pune University, Pune
Mills JP, Hutton JH (1929) Ancient monolith of North Cachar. J Asiat Soc Bengal 25:295–296
Pargiter FE (1897) Ancient kingdoms in Eastern India. J Asiat Soc Bengal 66:110
Poddar B, Ramesh NR (1983) Spotlight on prehistory of Tripura. GSI (NER) News Lett 2(1):1–4
Rao SN (1977) Excavations at Sarutaru – a Neolithic Site in Assam. Man Environ I:39–43
Sharma TC (1966) Researches on prehistoric archaeology of Assam. J Asiat Sci Soc IX:4–7, Gauhati
Sharma TC (1972) Stone hill of Garo Hills, unpublished thesis, quoted from Ghosh A (ed) (1989) An encyclopaedia of Indian archaeology, vol 2. Munshiram Manorharlal, New Delhi, p 25
Steel EH (1870) Celts found among the Namsang Nagas. In: Proceedings of the Asiatic Society of Bengal. Calcutta, pp 267–268
von Fürer-Haimendorf C (1948) Notes on the stone age of India. Man India 28:197–208
Winternitz M (1981) A history of Indian literature, vol I. Motilal Banarsidass, Delhi

Chapter 11
People of North-East India

Abstract The population of North-East India is formed of several racial stocks, principally, the Mongoloids, the Indo-Aryans, the Australoids or Austric and the Dravidians, the last being a very minor group represented by some immigrant population. While the original settlers were the Mongoloids, the Indo-Aryan and other groups arrived later. There is undoubtedly a dominance of Mongoloid element in the population of North-East India. Besides the racial differences, there is a tribal–nontribal duality recognised by the Constitution of India to secure certain benefits to the tribal community, to enable them to catch up with the rest of the society, in educational attainment and the level of living. Most of the tribes or tribal communities are concentrated in the hilly states of Arunachal Pradesh; Nagaland; Manipur; Mizoram, on Myanmar border; and Meghalaya, sandwiched between Assam and Bangladesh. While the tribes of Arunachal migrated to this region at a very early date, the arrival of the Nagas, Kukis and Mizos in their present habitat is relatively recent. Most of the indigenous people of North-East India have embraced Christianity, transforming the social ethos and cultural practices of the Nagas, the Mizos, the Khasi and the Garos. The Bodos, the largest tribal group of the region and largely confined to Assam, have adopted Hinduism and are known by different names like Bodos, Kacharis and Mechs. Some who came under the influence of the Royal Koch dynasty call themselves 'Rajbanshis', meaning people having royal lineage. The Kukis of Manipur and Tripurs of Tripura are other important tribal groups.

The nontribal component of the population, which constitutes over 70 % of the population of North-East India, is confined to Assam, Manipur and Tripura. In all these states nontribal population is more than percent; and in Assam, the most densely peopled state of North-East India, 88 % of the population falls in nontribal category. The Assamese society consists of people following different faiths, though a large majority follows Hinduisms. They speak Assamese, an Indo-Aryan language, which has its own script and a rich literature. The Assamese culture has syncretised a culture that has derived multiple elements from neighbouring societies or pre-existing cultures. The caste system is not universal as in other Hindu societies and, to that extent, Assamese are far more progressive.

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Nowhere in India is there such a bewildering mosaic of humanity with varying racial ancestry, ethnic background, religious persuasions and speaking different languages and dialects, as in North-East India. This is the culmination of a history of immigration, in successive waves, of people who arrived from the north, north-east and the southeast on the one hand and the Gangetic plain to the west on the other. There is a well-founded belief that the earliest settlers were largely of mongoloid stock, recognised in the identity of *Cinas* and *Kiratas*, the people who formed the army of the legendary king Bhagdatta during the Mahabharata war. As mentioned in the *Udyog Parvan* of *Mahabharata*, the Cinas and Kiratas inhabited the hilly regions in the north and the regions near the sea in the south (Choudhury 1987).[1] Commenting on the use of the word *Kirata* and *Cina*, K. L. Barua (1933:2) suggested that the word *Kirata* was, perhaps, a generic name of the Mongoloid people, and the name '*Cina*' was applied particularly to Tibetans and Bhutanese. That the Kiratas were Mongoloids and Assam a reservoir of Kiratas or Mongoloid people is suggested by many literary scholars like B. K. Barua and S. K. Chatterjee. The former asserts that 'the earliest inhabitants of Assam were the Kiratas, Cinas and other primitive tribes designated as Mlecchas and Asuras' (Barua 1951). Cinas, according to Barua, were the Chinese who entered Assam from the North-East very early. Chatterjee also equates Kiratas of the Mahabharat and the Puranas with the Mongoloids. In his assessment, 'Assam and Nepal were the areas where large bodies of Sino-Tibetan speaking peoples – loosely called Mongoloids by the Europeans and known to Sanskrit – using ancient Indians as Kiratas – merged into an ever expanding Hindu body – politic or Indian nation' (Chatterjee 1955).

The sequence of arrival of different groups of people, either of the same racial stock or of different races, is difficult to reconstruct. At best, it could be a logical evaluation of the available facts or their interpretation into acceptable reconstruction. Two of the earliest arrivals of the Mongoloid people in what is North-East India, often referred to by historians and linguists, relate to Bodo–Kacharis and Khasi-Syntengs. Barua (1951) thinks that the linguistic evidences, popular customs and some of the place names of the province indicate that the earliest inhabitants of Assam were speakers of Indo-Chinese language of Mon–Khmer family, which has been characterised by linguists as the Austric family of languages. This is a questionable proposition, and though the various dialects of Khasi language belong to the Mon–Khmer family, it does not explain the attenuated diffusion of this race. Why did the Mon–Khmer-speaking people remain confined to Meghalaya plateau if they were the first to arrive on the North-Eastern scene?

The second group of people, who arrived very early in Assam and are presently widely distributed in the entire North-East, but principally Assam, and known by different names such as Bodos, Kacharis, Mechs, Rabhs, Lalungs, Dimasas, Garos, Chutias and Koches, have a better claim of being the earliest settlers of the region, by virtue of their wide spatial diffusion and their large number, the largest among

[1] A full discussion of the very early period of Assam and its people can be seen in Choudhury's book, a Ph.D. thesis of the School of Oriental and African Studies, London (1987).

the tribal groups of the region. This Mongoloid group had half a million people in the beginning of the nineteenth century.

The history of the arrival into India of various Mongoloid groups, speaking dialects of Sino-Tibetan speech family, is not well known nor have the varied languages and dialects in the family been satisfactorily classified (Chatterjee ibid:154). When did the Indo-Aryans arrive in Brahmaputra valley is not known with certainty. The participation of Bhagdatta in *Mahabharata* does not suggest much about his racial root. He may have participated in the Mahabharata war with his army of Cinas and Kiratas, like the kings of the South India, who participated in the war, without their being a part of the Aryan group. But what is certain is that the Indo-Aryans should have been in the Brahmaputra valley any time before seventh century A.D. The earliest irrefutable evidence of the presence of the Indo-Aryans in Assam is the Nidhanpur copper plate inscription of Bhaskarvarman of seventh century A.D. (610 A.D.). Written in Sanskrit it suggests an Aryan origin of Bhaskarvarman. And, if the genealogy suggested in that inscription is accepted, then even Bhagdatta could be assigned an Aryan ancestry. It is quite possible that the Aryans had established a foothold in Assam during the Mahabharat war period. To that extent, the remarks of S. K. Chatterjee (1950) that the Indo-Aryans arrived in Assam very early carry some weight. According to him, the presence of Indo-Aryans 'was noted by the 10th century BC, when the Veda books were completed. The composite Hindu (i.e. Austric-Dravidian-Aryan or Indo-Gangetic) civilisation reached the Mongoloid peoples of north and north-east mountains and plains from about that date'. Much of the inscriptional evidence, however, does not confirm the arrival of the Aryans before seventh century A.D.

The Mongoloid stream, however, was not greatly affected by the arrival of the Aryans, and the peripheral mountainous areas of the region witnessed the successive arrival of different Naga clans and later the Lushais and Kukis occupying the present Nagaland, Manipur and Mizoram. Similarly, the Himalayan and sub-Himalayan regions were also colonised by widely dispersed Mongoloid tribes.

11.1 The Arrival of the Ahoms: The Rulers of Brahmaputra Valley

After the Tibeto-Burman-speaking Mongoloid people, the earliest settlers of the area, had interacted with the Indo-Aryans, and a syncretic culture absorbing dominant elements of both the groups had evolved, there appeared on the scene another group of Mongoloid people, more aggressive and warlike, ready to dominate the area by their prowess. These were the Ahoms who invaded the Brahmaputra valley from the North-East, subjugating the small ruling tribes in the area, like the Morans and Borahis, and established their rule in the North-Eastern part of Assam, with their capital at Garhgaon, near Sibsagar. The Ahoms arrived in Assam in 1228. 'They were an offshoot of the great Tai or Shan race, which spreads eastwards, from the whole of Further India and far into the interior of China' (Gait 1906). Initially

rulers of a small territory, they expanded their kingdom and became ruler of virtually the entire Brahmaputra valley which they ruled for 600 years, with small interregnums when they retreated from west Assam under the impact of the Moghuls, but regained control of the area soon after.

The Ahoms left a lasting impact on the people and society of Assam. They adopted Hinduism, established marital relations with the local people, made Assamese the official language and, but for their royalty, were fully assimilated in Assamese society. The first Ahom king Sukapha had started from his native land with '9,000 men, women and children', and it may be surmised that the great majority of his followers were adult males. This limited the scope for the Ahoms to propagate themselves without intermingling and marrying with the local Assamese. A racial fusion started with the assimilation of the Chutias, Morans and Borahi families in the Ahom fold and 'by lapse of time and intermarriage, these neighbouring tribes came to be recognised as genuine Ahoms' (Gait ibid:2). The question of racial fusion and intermarriage of Ahoms with the people of Brahmaputra valley is aptly described by Dalton. Talking about the Ahoms, he states that 'from the very splendid type of Indo-Chinese features which they exhibit, it is probable that the blending of the races was not confined to an adoption of religion, language and custom. Indeed, it is stated that the Shans brought no women with them unto the country, and found the daughters of the land so fair, that they deemed it quite unnecessary to send for girls they had left behind them. This sufficiently accounts for their looks and deterioration in other aspects. I have seen very handsome faces amongst the Ahom nobility. The ladies of the ex-royal family were noted for their beauty, with oval faces, features not very prominent but sufficiently raised and regular, large eyes, and long, silky hair' (Dalton 1872). Thus, it is evident that the Ahoms were assimilated in the Assamese society, adopting Assamese as their language and Hinduism as their religion and identifying themselves with the local populace by intermarriage.

The Nagas of Nagaland and Manipur and the Lushais of Mizoram or the Kukis, all belonging to the Mongoloid fold, entered North-Eastern India at different dates. The Nagas were there in the North-East before the Ahoms arrived and resisted the advance of the latter though they were overpowered. The Lushais, Kukis, Khamptis, Shingphos and other groups may have arrived in stages, during the last 400 years, as suggested by Grierson (1905). Like the eastern periphery, the mountainous and sub-mountainous region north of Brahmaputra, now called the state of Arunachal Pradesh, has a number of Mongoloid tribes like Monpas, Akas, Daflas (now called Tagin), Apatanis, Abors, Miris and various clans of Mishmis. Though numerically not very large, these Mongoloid tribes have an adjunct of temporary immigrants from other parts of India, their strength is only one-third of the entire population of the state.

Additional racial infusion in the population of the North-East was through a series of invasions particularly from Bengal. Starting with Muhammad Bakhtiyar Khilji whose campaign of Kamrup during the closing years of the twelfth century ended in disaster, the invasion by Mir Jumla in 1662, overrunning Brahmaputra valley, there were several Muslim incursions in Assam, each leaving behind a

substantial number of Muslims, adding to a mild infusion of Indo-Aryan race, as the Muslim soldiers though practising a different faith were, in all probability, Indo-Aryan in their racial make-up.

A prolonged immigration of people from outside North-East region, initially from Bengal and subsequently from other states of India, added new elements to the racial complexity of the region. The immigration, initially of Bengalis to assist the officials of the East India Company and later of the tea plantation workers from Orissa, Bengal Bihar and Uttar Pradesh, brought in a substantial number of tribal as well as nontribal populations. Though the recruitment of tea plantation workers ceased in 1941, the immigration from East Pakistan and later Bangladesh continued bringing about changes in the religious, and partly racial, composition of the population of the region.

11.2 Racial Elements in North-East India

Though not a significant aspect in discussing modern societies, racial element, as expressed in anthropometric characters, tends to distinguish societies and groups on the basis of race. It is important to mention that the entire population of over 40 million people of the North-East is represented by more than one racial stock having undergone a prolonged period of miscegenation, or in some cases juxtaposed to each other, in different geographic milieus.

The people of the North-East are represented by the following racial elements, given in order of their importance:

1. Mongoloid
2. Indo-Aryan
3. Australoid or Austric
4. Dravidian

11.2.1 The Mongoloids

The Mongoloids are by far the oldest human stock in the region. Their antiquity is established with the mention in Mahabharat of *Kiratas* and *Cinas*, the Mongoloid people forming the army of Bhagdatta, the king of Pragjyotish. Mongoloid people entered the North-Eastern region in successive waves and spread widely to be known by different names depending upon the sequence of their arrival and their present habitat (Choudhury 1987).[2]

[2] For a full discussion of the ancientness of the Mongoloid tribes, see P. C. Choudhury (1987) op.cit.

Leaving aside the Indo-Aryan elements in the population of Assam and Tripura, and the Khasis of Meghalaya, a large section of the population of North-East India is Mongoloid in their racial traits. The states of Mizoram, Manipur, Nagaland and Arunachal Pradesh are largely inhabited by Mongoloid people with some sprinkling of other elements represented by later migrations. In Assam, it is difficult to distinguish the Mongoloids from the non-Mongoloids, as there has been a continued mingling of different populations. This is especially so with the Bodo group, the earliest Mongoloid people, as many of them have adopted Hinduism, or the Ahoms, whose descendents, though Mongoloid, cannot be easily distinguished from the Indo-Aryans of the plain. The tribal population of Karbi-Anglong, North Cachar Hills or the Tripurs of Tripura is clearly Mongoloid.

One may say that with the exception of Khasis, all other tribal groups and the Bodos of Assam divided into different groups and some transformed into Hindu castes are grouped as Mongoloids.

11.2.2 Indo-Aryans

The presence of Aryan kings in Kamarupa is recognised very early in the history of Assam. Most caste Hindus and Muslims should logically belong to the Indo-Aryan stock. The dilution of racial elements after millennia of intermarriage is obvious. The people of Assam plains and Tripura, both having a large percentage of immigrant population essentially from Bengal but also from other parts of India and speaking Indo-Aryan languages like Assamese, Bengali, Hindi and Urdu, are believed to be the descendants of Indo-Aryan people. The nontribal population of the North-East is primarily of Indo-Aryan stock. For long these people dominated the cultural life of Assam, pioneered reform movements, were the elites in the society and represented a stable society with a hierarchy of interests. Even at the height of Ahoms' rule, a Mongoloid group, the Indo-Aryans, formed important elements in the administration of the state.

11.2.3 Australoid or Austric

It was the celebrated linguist Grierson (1905) who grouped the various dialects of Khasi language under the Mon–Khmer family of languages and concluded that the Khasis are akin to Mon–Khmer people. Grierson while comparing the Khasis with the people of Lower and Middle Mekong and the Middle Chindwin valley qualified them as 'Islands of Mon-Khmer origin standing amidst seas of alien people' (Grierson 1905:1). A number of subsequent studies did not quite accept the premise that the speakers of a language, as their mother tongue, infallibly means that they racially belonged to the original stock that developed and spoke that language.

Some of the early anthropologists who tried to establish racial relations in Assam included Waddell (1900), Dixon (1922) and Olivier (1958). While the first two evaluated the anthropometric evidence of Khasi population, Olivier evaluated the anthropometric indices of Naga population. It is strange that both, Waddell and Dixon, concentrated on Khasi population. Easy accessibility to Shillong in the midst of Khasi territory may have been a consideration. The measurements collected by Dixon from the Khasi inmates of Shillong prison, being a meagre 25, are hardly adequate. He took even the measurements of Waddell, thus making a total of 103. He grouped these measurements by a combination of cephalic and nasal index into seven categories.[3] The fundamental stratum among the Khasis, according to Dixon, is the DP type characterising roughly half the total population. The Khasis, according to him, in spite of their linguistic isolation among the people of Assam, are closely related to the majority of the Tibeto-Burman tribes. With them, they represent a very old drift of Southeast Asian peoples, superimposed upon a previous aboriginal Negroid stratum and overlain by a later wave of Alpine people. Unlike their neighbours, however, they have succeeded in retaining their speech. Thus, what Dixon concluded in essence is a far older migration of the people from Southeast Asia, the Australoids, pushed subsequently by the Tibeto-Burman Mongoloid people and latter superimposed by the Indo-Aryans. The Indo-Aryans, after they arrived, revolutionised the conditions in Bengal and, in large part, replaced the earlier speech and culture by what brought with them from north-western India, but did not greatly modify the actual social structure. In Assam, their racial influence was the slightest and only the Syntengs show any considerable influence of such mixture (Dixon 1922:10).

Contrary to what Dixon wrote, Das (1987) does not believe that there was a Negrito substratum to the Australoid people. Arguing elaborately, Das asserted that 'the Australoids left behind some genetic endowments', but they came before the advent of the mongoloids, who absorbed partially or completely old Australoid strain (Das 1987:32).

11.2.4 Dravidian Racial Element

The Dravidian strain in North-East India is confined to a relatively small number of immigrants from Andhra Pradesh, especially Gonds who arrived in Assam as tea plantation workers and are settled here, but their presence is not very noticeable.

[3] These groups included (1) MM type (Mesocephalic–Mesorrhine), (2) DM (Dolichocephalic–Mesorrhine), (3) BM (Brachycephalic–Mesorrhine), (4) ML (Mesocephalic–Leptorrhine), (5) MP (Mesocephalic–Platyrrhine), (6) BL (Brachycephalic–Leptorrhine) and (7) BP (Brachycephalic–Platyrrhine).

Table 11.1 Comparison of Naga skulls with Chinese skulls in terms of different indices

Indices	Chinese	Nagas
Skull capacity	1,425	1,377
Breadth index	78.8	78.1
Height index	75.2	78.4
Gnathic index	99.0	98.6
Orbital index	89.9	88.5
Nasal index	49.8	53.3
Palatomaxillary index	123	125
Nasomolar index	143	144

Source: Thane (1882:218)

11.2.5 Anthropometric Characteristics and Racial Affiliation of Some of the Tribal Groups

Besides the Khasis, a number of studies on other tribal groups have been made by foreign as well as by Indian scholars. Singh's (1935) work on somatology of Angami and Semas, Suri's dissertation (Suri 1985), K. S. Singh's Ph.D. thesis (1978) on 'Bio-anthropological study of three populations in Manipur valley' and a series of studies by B. M. Das (1987)[4] on the tribes as well as the castes of Assam are a few works that can be mentioned. But besides these Indian authors, one can note of one of the earliest studies on 'Naga Skulls' by George Thane (1882) and another by Olivier (1958) again on the Nagas of Assam.

Thane's 1882 study of Naga skulls is based on four Naga skulls collected from a museum and a fifth brought by Col. Woodthrope who had visited Nagaland and had written on it. Thane found these Naga skulls mesocephalic, but in their cranial characters, these skulls have a close affinity to those of Mongolian type. The indices worked out by Thane (listed in Table 11.1) support his statement.

11.2.5.1 George Olivier's Study of Naga Skulls

Another study of Naga skulls was made by George Olivier (1958). This is a strange case of fieldwork and measurements by one researcher and analysis by someone else. The introductory part of the publication of Olivier in *Man in India* (1958) merits reproduction here to give the background of this publication.

> In 1956 a German ethnologist Dr. H. E. Kaufman carried out, under difficult conditions, anthropometric measurements of the Nagas in Assam. He did not publish them but gave them to Prof. Vallois of Paris who handed them over to me for study. The analysis of these documents came out in the 'Bulletin of Anthropological Society of Paris' in 1955 and could not perhaps reach the anthropologists in India who are still interested in the subject. (*Man in India* 1958:105)

[4] For a comprehensive list of Das's work, refer to the bibliography appended to his book *The People of Assam* (1987).

On the basis of 166 skulls of men that Olivier received, 94 were Konya Nagas, 38 Semas, 28 Aos and 8 Angamis. In fact, he had also received 28 female skulls, but the sample being too small, he ignored it. As it appears Olivier's findings are more relevant to the Northern Nagaland, the home of Konyak and Ao Nagas. His conclusions were as follows:

Anthropometric Characteristics of the Nagas

Nagas of Assam belong to yellow race
Sub-medium height
Mesocephalic head
Euryprosopic face
Mesorrhine nose
Brownish yellow skin
Neat Mongolian form of eyes
No Negrotoid characteristics

11.2.5.2 Olivier's Sequence of Immigration in the North-East

One is not certain how Olivier reconstructed the sequent occupance of North-East India only with the help of skulls. What appears probable is that he blended the research findings of other sources and worked out a chronology of migration in the North-East which is as follows:

1. The first inhabitants appear to be the Khasis and the Syntengs belonging to the Mon–Khmer linguistic group.
2. This was followed by the invasion of the Bodo group (Garo, Kachari, Tippera, Lalung, Rabha, Mech) 'hunters' of head like the Nagas, from the western mountain (Bod-Tibet), but they were not Nagas.
3. The Nagas came afterward. They were natives of North-East Tibet and seem to have reached Assam from south driven by Kuki–Lushai clan.
4. In the beginning of the Christian era, small groups of Bengalis spread into the plain of Assam.
5. Lastly in the beginning of the thirteenth century, a Thai tribe, the Ahom, invaded Assam and settled there.

What appears certain is that Olivier has picked up the idea of the Khasis and the Syntengs being the earliest settlers of the region from Dixon, referred to earlier. Secondly, he has completely ignored the migration of the Indo-Aryans from the Gangetic plain and thought of only Bengalis as the colonising agents.

In the contentious issue of the sequence of arrival of the Khasis and other Mongoloid people, Das (1987) appears to be ambivalent and suggested two possibilities. 'One is that they (*the Khasis*) were racially Mongoloid but have adopted the Austric language and the other possibility is that the Khasis were an Australoid people and their language was Austric', a possibility also hinted at by Chatterjee (1950). In course of time, their physical features have undergone remarkable change,

but their language has been retained. This idea of change of physical features gets support from the notion of microevolution that was well elaborated upon by Das (1981), as a theme, in his well-known work *Microevolution*.

11.3 Geographical Distribution and Sociocultural Characteristics of the People of North-East India

In any evaluation of the geographical distribution of the people, their sociocultural traits and the level of their economic existence, the entire population has to be grouped on the basis of their habitat, clan or tribe, religion, caste and such other criteria that clearly demonstrate the pattern of variation in the mode of life of people, their culture and their economy.

An important characteristic feature of the society in the North-East is the predominance of tribal population in many of the peripheral states with certain tribes often occupying exclusive space, as in Nagaland, Mizoram and Meghalaya. It appears convenient and even appropriate to consider the people of the region under two categories, i.e. tribal and nontribal population, followed by a discussion of people belonging to each tribe or subtribe on the one hand and of different religions and castes of nontribal population on the other.

11.3.1 The Tribal–Nontribal Duality

The tribal–nontribal duality is not a universally valid concept nor does it reflect any intellectual honesty, in so far as it remains a subjective view based on tradition, administrative history and our own idea of a formal and a non-formal religion. The contemporary social reality about the so-called tribals is far removed from what was perceived just a century ago. The Nagas, the Mizos, the Khasis and several other tribal communities of the North-East are radically transformed during the last 100 years. Most of them have adopted Christianity as their faith and have virtually shed their old totemistic rituals and beliefs. The literacy rate in Mizoram and Nagaland is 91.6 and 88.1 %, respectively, a notch higher than what it is in Assam, essentially a nontribal region. There are certain pockets in Arunachal, Nagaland or even Assam where the totemistic beliefs still persists, but there are no savages who lived naked and prided themselves on head hunting.

On the scale of culture and civilisation, if there were one, the majority of the so-called tribals of the North-East would not measure lower than nontribal people of Cachar or the Brahmaputra plain. The Indo-Aryan group of people largely inhabiting the plains of Brahmaputra, Barak and West Tripura have, no doubt, a millennia-old cultural tradition and a society that is bound as much by social ethics as by law. Yet, the distinction that existed between tribals and nontribals a century ago is completely

blurred, if not altogether eliminated. The dualism, however, persists, and an inventory of Scheduled Castes and Scheduled Tribes is maintained in the Indian Constitution, modified from time to time. Strangely, the people of these peripheral states, branded as tribes like to retain the distinctiveness, arguably to maintain their cultural identity, but more plausibly to remain the beneficiaries of certain concessional rights granted to them by the Constitution of India. Never has one heard of a movement from any tribal quarters asking for a deletion of their names from the category of Scheduled Tribes.

The assumed tribal–nontribal duality corresponds with the existing landscape duality of hills and plains. The dissected forest-covered hilly areas are largely inhabited by the tribals, whereas the fertile alluvial plains are colonised largely by nontribal people. It is not that the Brahmaputra or Barak plain has no tribal population; Assam, even today, has a sizable presence of tribal population, by far the largest number among the states. But one has to take note of the fact that a large mass of tribal population, essentially of Bodo group, was proselytised to Hinduism since the late fifteenth century under the influence of Vaishnavite saint Sankardeb. Thus, the phenomenon of conversion to Hinduism, over several centuries, was similar to what was witnessed in Meghalaya, Nagaland, Manipur and Mizoram during the last 150 years, when hundreds of thousands of Nagas, Mizos and Khasis adopted Christianity under the persuasive impact of Christian missionaries.

The phenomenon of treating all Christians and Hindus having tribal roots as tribals, as if others never transited that stage, defies logic. But, since there does not appear to be any resistance to the continuation of this tribal–nontribal dualism, for a descriptive account of people, the tribes as defined in the Constitution, as amended from time to time, are taken for evaluating their strength, distribution and socio-economic conditions.

11.3.2 The Tribal Realm of the North-East

No state in the North-East is devoid of tribal population. Their strength in each state is given in Table 11.2, and they are listed in the appendix at the end of this chapter, as they appear in the Constitution (Fig. 11.1).

Numerically, the tribal population of the seven North-Eastern states of India is over ten million, which is more than 27 % of the total population of the region. This is in sharp contrast to the strength of the tribal population in India standing at 8 % of the total population. More than 30 % of the total tribal population of the North-East region is settled in Assam, though the relative strength of tribals in the total population of the state is only 12 %. The four states, viz. Arunachal Pradesh, Meghalaya, Mizoram and Nagaland, are inhabited almost exclusively by tribal people with some nontribal population having taken assignments without any domicile status. On the other hand, in the states of Assam, Tripura and Manipur, less than half of their population falls under tribal category.

Table 11.2 The strength of tribal population in the North-East (2001)

State	Total population	Tribal population	Percentage of tribal population in the state	Percentage of state's tribal population of the total tribal population of all seven states
Arunachal P.	1,097,968	705,158	64.27	6.81
Assam	26,655,528	3,308,570	12.80	31.95
Manipur	2,166,788	741,141	34.20	7.15
Meghalaya	2,318,822	1,992,862	85.94	19.24
Mizoram	888,573	839,310	94.45	8.10
Nagaland	1,990,036	1,774,026	89.14	17.13
Tripura	3,199,203	993,426	31.05	9.59
Total (North-East India)	**38,316,918**	**10,354,493**	**27.02**	**99.97**
India	1,028,610,328	84,326,240	8.19	12.20

Source: Census of India 2001, General Population Totals (India States and Union Territories)

11.3.3 The Principal Tribes and Their Distribution

11.3.3.1 Nature of Distribution

It is an accepted fact that some tribes have a large number of subtribes, whereas others have a much smaller number, where each subtribe feels bound by an underlying sense of oneness. The list of Scheduled Tribes in India is modified from time to time. In any modification, some of the tribes are split into a number of tribes, each claiming an independent status. In some situations, more than one tribe are clubbed together, and in some other cases, new names are added. It is rare to find a tribe without a subtribe. To quote an instance, 'Adi', a tribe of Arunachal Pradesh, comprises a number of subtribes like Ashing, Bokar, Bori, Miniyong, Padam and Pasi, and each is counted separately. One of the important ethnic groups among the Adis is that of Adi-Gallong; Hajgong outnumber their parent groups as they want to maintain a distinct identity. Similarly, Bangni, another tribal group, was formerly considered a part of Dafla/Nishi tribal community, but today they like themselves to be identified as an independent community. In Assam, the Bodo tribe has a large fold, and many other tribal groups, like Garo, Rabha, Lalung and Mech, have the same ethnic roots, yet they are counted as different tribes and occupy different habitat. In Meghalaya, the Jaintias or Syntengs, Wars, Bhois and Pnar all have a common route but retain their distinct identity.

The most illustrative case is that of Nagas, who despite having a common origin are greatly differentiated. Depending on their arrival in a large trail of immigration, the habitat they occupy and the typical clan organisation, they consider themselves distinct even from their neighbours and have been often going to war with them. Each of these Naga group has a distinct dialect, though as a matter of political strategy they have adopted Assamese with a sprinkling of Naga words as their common language which they call *Nagamese*.

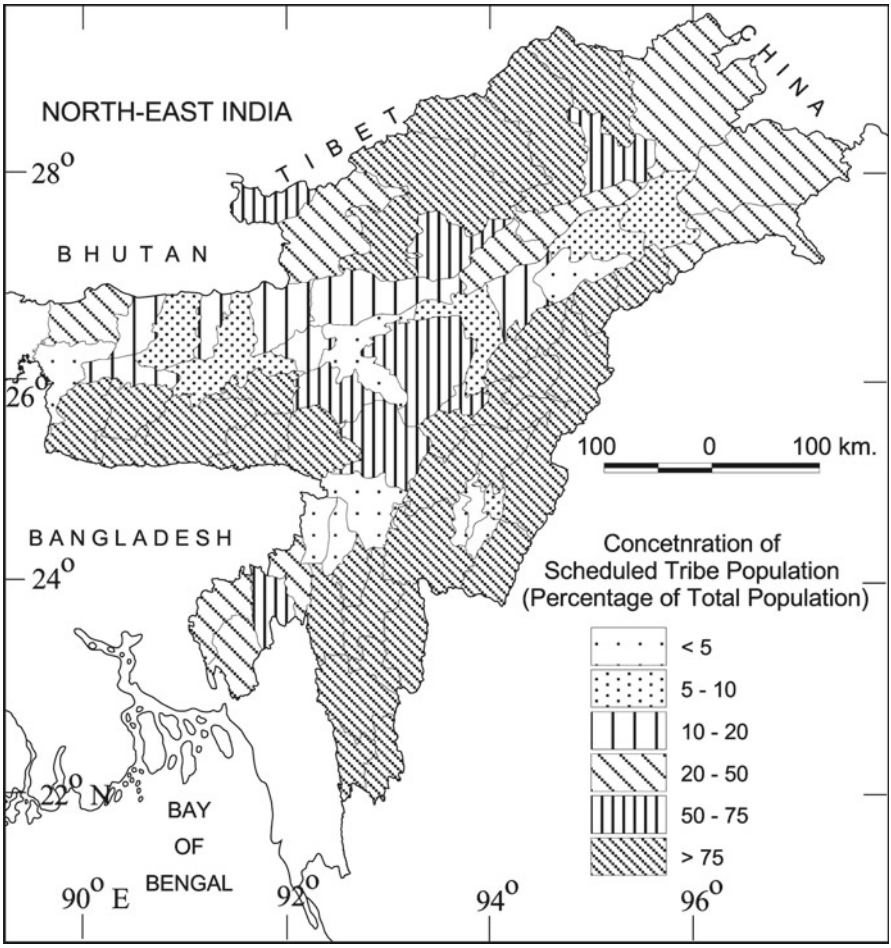

Fig. 11.1 Proportion of scheduled tribes (indigenous people) expressed in percentage in the population of each district, in North-East India

In Manipur, the two broad tribal groups, viz. Nagas and Kukis, are divided into a number of clans, and each maintains an independent identity. Originally, 'Naga' was added as a suffix to clans like 'Kabui' or 'Tangkhul', but the suffix 'Naga' was dropped in 1953, and Tangkhul and Kabui stand as independent tribes. The Kukis are divided into 37 clans and each establishes its own importance.

11.4 The People of Arunachal Pradesh

As shown in the Table 11.2, only two-thirds of the population of Arunachal Pradesh is classed as tribal. The remaining one-third comprises immigrants that have converged on the state, without any domicile status and the right of permanent residence, but to

participate in the process of development of the state. The original settlers of Arunachal are the Mongoloid people, speaking Tibeto-Burman dialects, intermediary between the Tibetan and the dialects spoken in Assam and further India (Grierson 1905, part III, p. 569). Sheltered by the Himalayan heights in the north and the movement to the south limited by Brahmaputra, the Arunachal tribals remained confined between these two limits. Constrained by dissected terrain and north–south flowing entrenched streams, the tribes of Arunachal did not expand east–west much, as such movements required crossing of deep valleys. Thus, each tribe remained confined in a specific north–south zone occupying the interfluves of two rivers, perched on gentle slopes, hilltops or higher river terraces. In any of these situations, they depended on shifting cultivation for their living. Year after year, they slashed the forests, let it dry and burnt it to provide the ash-field for growing a variety of crops like rice, millet, maize and cotton and vegetables like gourds and pumpkins. Besides, they hunted and reared pigs and exchanged articles to trade with the plainsmen. These people had periodic contact with Tibet to obtain, among other things, rock salt, coats, pipes of metal, vessels, swords, beads and woollen goods some of which they traded with the people of the plains, getting from the plains rice, and other piecemeal goods. Some of the tribals of Arunachal, like the Monpas, kept large herds of cattle grazing them at different altitudes as warranted by weather.

The numbers of tribal communities in Arunachal have varied with time, their number decreasing by clubbing together or increasing by splitting (Fig. 11.2). The Anthropological Survey of India produced a list of 97 tribes in Arunachal Pradesh (Mandal et al. 2002). This number, based on 1981 Census and again repeated in 2001, is too inflated. The major tribes which are easily identified number around two dozen. Bhagabati (2003) talks of 'twenty-six odd major Indo-Mongoloid tribes, to which the Arunachalees belong, have varied social structures and distinctive cultures'. There are, however, commonalities: 'All the tribes of Arunachal have patrilineal social structure. The institution of bride price is universal. There is no caste system, and most societies have an egalitarian outlook'. Yet the society is divided into chiefs, nobles, the middle class and slaves or servants, and intermarriages between them are not permissible. The people of all classes, however, eat together and take part in tribal councils.

The political life of the tribes is organised around the tribal councils like the 'Kebangs' of various Adi tribesman. The economic life of Arunachal tribes carries the imprint of the habitat, the area of colonisation.

11.4.1 The Main Tribes of Arunachal Pradesh and Their Distribution

Of the 97 tribes recorded in the Census of India (2001), more than half have less than 500 persons in their group. There are only 24 tribes, each having a population of over 5,000 each (Table 11.3).

Some of the tribes are clustered and appear to have split from a common route. The Nissi and the Daflas and even the Bagni share the same space, largely confined

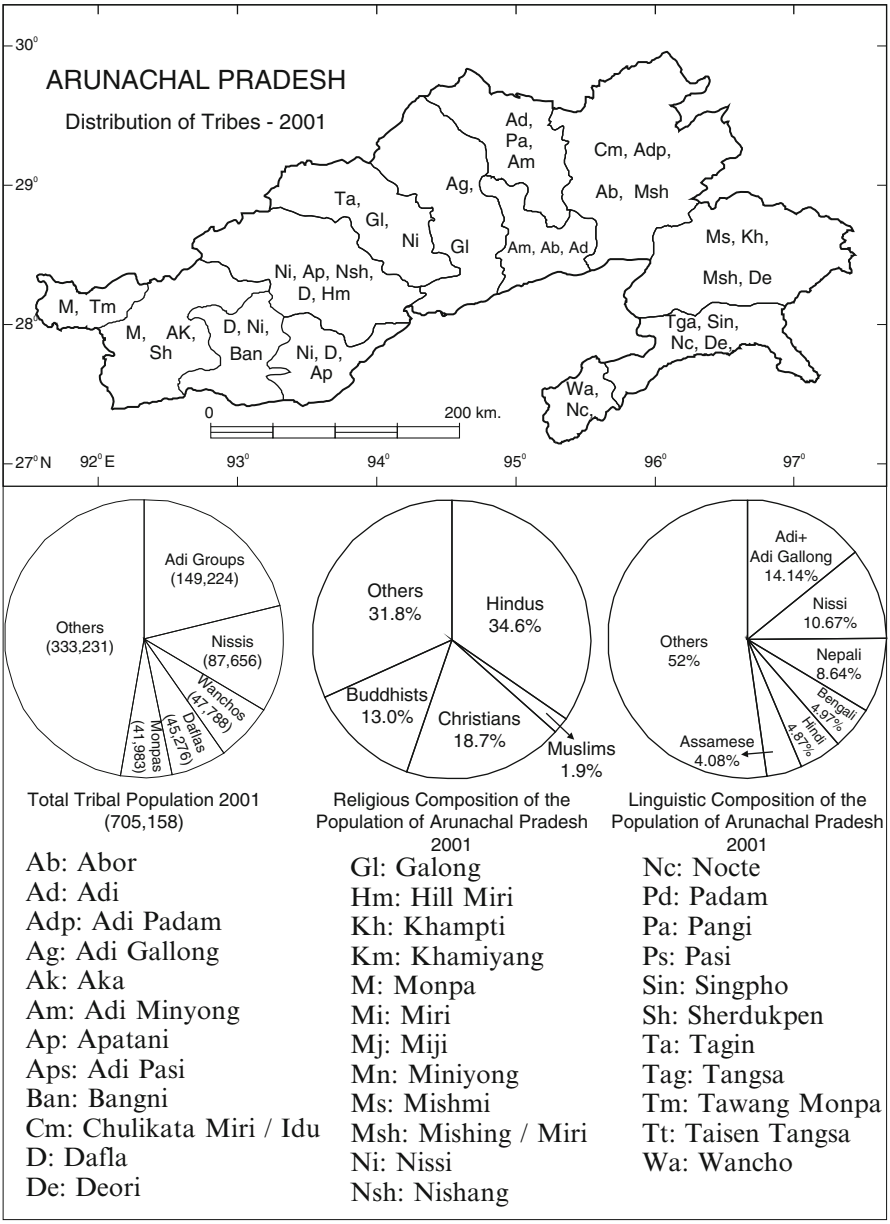

Fig. 11.2 District-wise distribution of different scheduled tribes of Arunachal Pradesh: their religious and linguistic composition (as per the Census of India-2001)

to East Kameng and Lower Subansiri. Similarly, Adi, Gallong, Adi-Gallong and Adi-Minyong occupy the West and East Siang districts. Similarly, Noctes and Wanchos are confined to Tirap district.

Table 11.3 Principal tribes of Arunachal Pradesh and their population (2001)

Number in order of population strength	Tribe	Population 2001	Number in order of population strength	Tribe	Population 2001
1	Nassi (Nishi)	87,658	11	Gallongs	27,239
2	Adi-Gallong	48,126	12	Mishmis	25,161
3	Wanchos	47,788	13	Nishangs	21,907
4	Daflas	45,276	14	Tangsas	20,962
5	Monpas	41,983	15	Abor	19,927
6	Tagins	39,091	16	Mishing	13,591
7	Adi-Minyong	33,984	17	Khamptis	12,810
8	Noctes	33,680	18	Adi-Padams	11,625
9	Adis	32,583	19	Idu-Chulikata	9,350
10	Apatanis	27,576	20	Bangni	7,870

Source: Census of India 2001, A-11, State Primary Census Abstract for Individual Scheduled Tribe

If one is to group the tribes of Arunachal Pradesh geographically, one may come to five longitudinal belts in which the tribes would be akin to each other. These divisions would be as follows:

Divisions	Tribes of the division
1. Western Division	Monpas, Tawang Monpas and Sherdupken
2. Mid–West Division	Nissis, Daflas, Apatanis and Bangnis
3. Mid–East Division	Tagins, Adi-Minyong, Adi-Gallong and Adis and Abors
4. Eastern Division	Mishmis, Khamptis, Miris, Singphos and Deori
5. Southeastern Division	Wanchos, Noctes and Tangsas

Difficult terrain and poor accessibility have restricted the movement of tribes, confining them to interfluvial space. This has led to a greater cohesion among tribal groups in each division. A brief account of some of the major tribes, including their economy and social conditions, is given blow.

11.4.1.1 The Tribes of Central and Eastern Arunachal Pradesh

Nishis/Daflas

Daflas/Nishis/Bangnis represent the largest tribal group of Arunachal. Their total population was 208,337 (2001), accounting for 19 % of the total population of the state. Largely concentrated in Central Arunachal Pradesh, Daflas were the most defiant tribe in history and were never conquered by the Ahoms (Photo 11.1). The term Dafla was used by the plainsmen of Assam for a tribal group occupying Subansiri basin, in the central part of Arunachal Pradesh. The Daflas identified

Photo 11.1 Nishi tribe family living in the Himalayan foothills (Siwaliks), 20 km north of Itanagar (Arunachal Pradesh)

themselves as Bangins or Bangnis. The related tribal groups speak a language called Nishi. The entire 'Dafla' universe consisting of Bangnis, Nishis and even Tagins occupies the Upper and Lower Subansiri districts. All these Nishi-speaking groups are the largest linguistic block and account for almost 20 % of the total population of Arunachal Pradesh. There is a well-defined preference for habitat by the sub-tribes among Daflas. The western part of Central Arunachal cutting into western Kameng is occupied by gentler Bangnis[5]; the eastern part is occupied by wild Daflas. For long, the Daflas were migrating frequently with shifting cultivation and livestock breeding, the mainstay of their economy. This has virtually stopped, and they have gradually turned to settled habitats. Living in houses of variable sizes, the Daflas are polygamous, and the father, his wives and children all live under the same roof. The houses are erected on stilts, with a width sometimes as large as 6 m. With their length extending to 40–50 m, these may sometimes accommodate as many as ten families. Dalton mentions that 'those who can afford are polygamists, but polyandry is far more common amongst Daflas than among eastern tribes' (Dalton 1872:36). Traditionally, the Daflas used to have slaves and servants, but the slavery has since been abolished. These people are not well united into the village communities and frequent quarrels between the families were once common. The Daflas are good at cane work, besides being able to weave and make potteries.

[5] Baruah (1960), Government of India Publications Division, New Delhi.

The Daflas have an elaborate system of religion. They believe in '*Wiyus*', the spirits and '*orums*', the ancestral ghosts. These have to be propitiated to evade sickness and death. Their benevolent god is '*Ane-Duini*', sun mother who grants prosperity and protects everyone. They employ the services of *Mugo* the tribal priest for rituals to appease the gods (Sinha 1977).

Adi Group

While the central part of Arunachal is occupied by Dafla group of tribes, the eastern part is largely inhabited by the Adi tribal group, consisting of Adis, Adi-Gallong, Adi-Minyong, Adi-Padam, Minyong, etc. About 200,000 (193,379) persons of Arunachal speak Adi as their mother tongue, and this makes 18 % of the total population of Arunachal Pradesh.

Adis and Abors are one and the same tribe. The Abors changed their name from Abors (unruly) to Adis, to do away with the stigma of being called 'barbarous'. The tribe is largely, if not exclusively, concentrated in the two districts of East and West Siang, straddling the river Brahmaputra from east to west. The Adi–Abors also extend westward into Upper Subansiri and eastward into Dibang valley district, though the latter district is also the home of some Mishmis. They can also be found in Lower Subansiri or even in Lohit district. Adi group of tribals occupying the eastern part of Arunachal is, numerically, the second important group after Dafla/Nissi group. They have been grouped differently according to the perception of the individual scholars. Shakespear writing in the early part of the last century (1914) divided them into four subgroups, viz. Minyong, Panghi, Padam and Shimong. A general division given in government publications splits the group into three subgroups, the Minyongs, the Padams and the Gallongs.

Each of these tribes has several subtribes. Minyongs and Padams are sometimes clubbed together under the name Padam-Minyong, with a number of small subtribes like Passis, Pangis, Boris, Ashings and Shimongs. While the Padams are settled between Dibang and Dihing (Brahmaputra) river, the Gallongs occupy the Syom valley.

The Adis are relatively democratic and govern the affairs of the tribe through an elected village council called *Kebang* that administers the village and settles disputes. Unlike many other tribes, the decisions are taken collectively and not by a single chief. The bachelors' dormitory among the Adis is known as *Mosup*. The Adis have adopted modern methods of agriculture including terrace cultivation. There is speculation that Mishings/Miris belong to the same stock as the Adis, and since the Miris appear to have immigrated earlier, they have been influenced by their association with the plains people and have developed a degree of sophistication akin to the people of Assam. This also explains their division into Plain Miris and Hill Miris, the former better educated and more progressive than the latter.

The Adis have their own gods and believe in *Doini-Pollo*, the Sun and Moon God, the symbol of two powerful forces in the firmament. They consider these gods as the upholder of the original truth and the witness to all that happens around us. *Doini-Pollo* has been regarded as one of the oldest gods. The two gods are looked

upon as the custodians of law and 'that is why, they are invoked invariably in the beginning of all meetings of the Kebang'. They speak Adi as their mother tongue but also appear familiar with Assamese and Hindi.

Adi/Abors account for more than one-fifth of the total tribal population of Arunachal and are comparable to the other important tribal group consisting of Nishi, Bangni and Tagin. Together, these three latter tribes were earlier known as Daflas among the Assamese. The Adi-Gallong of West Siang district, west of river Siang, and the Adi-Minyong of East Siang, together with a number of tribes like Membas, Khambas, Bokars, Polibos, Ramos and Boris, practise shifting cultivation. They have lately taken to terrace cultivation, though on a small scale, on the valley sides where minor irrigation is possible. Besides growing rice, maize and millet, horticulture involving oranges and bananas is introduced. Ginger, chilly and mustard are supplementary crops. Rearing of *mithun* (*Bos frontalis*) is gaining momentum. The community has some skill in knitting, weaving and cane and bamboo work, and the opening of crafts centre at Along has helped toning up the skill of the people in carpet making. There is some inflow of Adis particularly Adi-Padams in Dibang valley and even in Lohit district.

The Mishmis

Largely concentrated in Lohit district, with some of their kin established in Dibang valley, the Mishmis are the significant tribe in Arunachal Pradesh. The tribe was considered unruly, following the assassination of two French missionaries, Rev. Krick and Rev. Bourri, in 1854, while they were exploring the country and the route to Tibet. The situation changed after the British mounted a retaliatory attack and finally made them accept their authority. The Mishmis are divided into four subtribes, viz. Chulikata, Digaru, Miyu and Babjia, but they are also known as Idu, Taraon and Kaman, often distinguished by the way they knot their hair. The Mishmi society was never stratified, the only difference was between the king, the freemen and the slaves. They manage their affairs through a council, called *Abbda* (Baruah 1960)

Fair and short statured, they don't have well-organised villages and live in small scattered settlements. Mishmis have been traditionally polygamous and bride price is the only constraint in acquiring an increasing number of working hands as wives. Living in hilly terrain, they practise shifting cultivation like other tribes in Arunachal, keep flocks and herds and have also been good traders, trading with Assamese plainsmen. Having a large number of Mithuns (*Bos frontalis*) is considered prestigious, an indication of wealth. Along the tributaries of Lohit, the Mishmis grow potatoes and oilseeds, but rice and millet are the principal crops of shifting cultivation.

The Khamptis and the Singphos

South of the Mishmi land, occupying the lower part of Lohit district, are the Khamptis and Singphos, who, it appears, migrated to Eastern Arunachal Pradesh from the Shan Plateau in Burma during the late eighteenth century, presumably

following a prolonged predominantly interclan feud. Having settled originally in the vicinity of Sadiya, the Khamptis gradually spread occupying a larger area, in the lower part of what is now called Lohit district. Their total population was 12,890 in 2001, but this small group is highly skilled in many crafts especially wood and ivory carving. The Khampti women are good at embroidery with a keen sense of trading their handicrafts. Khamptis are Buddhists and celebrate the birth and death of Gautam with the help of their priests. A large number of them are literate and read their own script. Besides Khamptis, another community of Buddhists in eastern Arunachal Pradesh is represented by Singphos who are found largely in Tirap district. They are a small community of not more than 5,000 people. Living in large villages, perched on hill slopes, they have also large houses, each 50–60 ft long and about 20 ft wide with raised floors and open balcony on one side. In these large houses, there are more than one hearth around which the family sleeps, and over the fire place large bamboo racks, for smoking of meat, hang from the roof. Shifting cultivation is the mainstay of the Singphos. Their habitat straddles the boundary between Lohit and Tirap district, but their major concentration is in north Tirap (now Changlang). In fact, 'they occupy the foot hills of the northern part of Miao subdivision adjoining the southern boundary of Lohit district' (Elwin 1964). According to Shakespear (1914), the Singphos are identical to Kachin and their old home is in the Hukong valley in upper Chindwin basin. During the early nineteenth century, this tribe did not easily accept the British rule and often revolted. But, the community, a disciplined group, is now engaged in shifting cultivation and handicrafts. They are largely Buddhists and celebrate *Songken*, a Buddhist festival in the month of April.

Appearing first in 1793, during the reign of the Ahom king, Gauri Nath Singh, Singphos have since intermarried with the Assamese, multiplied and now settled in the hilly area of Tirap. Despite being Buddhists, they still believe in spirits and sacrifice fowls and pigs to please the spirits.

The Wanchos, the Noctes and the Tangsas

Three other tribes, largely confined to Changlang and Tirap, are the Wanchos, the Noctes and the Tangsas, in the order of their numerical strength. The southeastern part of Arunachal Pradesh, comprising the Changlang and Tirap districts, is largely inhabited by these tribes which account for about 51 % of the total population of these districts. While the Tangsas occupy the upper end of Tirap and Wamchik valleys, the Wanchos and the Noctes live further west in Tirap district. The Tangsas stand for a group of tribes and include Pangsa, a tribal group akin to Tangsa that arrived on the scene later. 'The Tangsa-Pangsa amalgam, broadly referred to as the Tangsa, is thus an assembly of some fifteen named tribal units, each of which is also a dialect group' (Bhagabati 2004:181). The tribe, like many others, has certainly moved from the traditional shifting cultivation to wet rice cultivation, besides taking interest in education, health, culture, politics and general welfare of the people through many promotional programmes of the government. But, despite all the progress, the traditional loyalties to the clan are very strong, a fact that militates

against a social cohesion on a large scale. Bhagabati (2004) concludes his essay on 'The tribe as a social formation: the case of Tangsa of Arunachal' by observing that 'what is taking place in this part of Arunachal Pradesh, is the revivification and consolidation of a traditional awareness of common immigrant origin and cultural homogeneity. As yet, the Tangsa youth do not appear to be particularly concerned with the regional social identity of Arunachal Pradesh as a whole'. It must be noted that Tirap and Changlang, the areas lying beyond the extreme eastern part of Assam but having common borders with the state, have a substantial nontribal population and are greatly influenced by them. Equally, there is a considerable overflow of Tangsa tribe in Assam.

The Wanchos and the Noctes live in the southern part of Tirap bordering Mon district of Nagaland, the former in Longding division and the latter in the extreme southwest of the district. A smaller tribe called *Yabin* inhabits the area southeast of Vijoynagar, not too far from Myanmar border. Agriculture is the mainstay of all tribes, wet rice cultivation in the valleys and shifting cultivation on undulating slopes. Besides rice, millet and maize, Job's tears (*Coix lacryma-jobi*) are also grown, supplemented by sweet potatoes, arum and '*Kachu*'. Among the vegetables, leafy vegetables, roots, tubers and fruits as well as pumpkins, brinjals, ginger, onions, mustard leaves, chillies, flowers of banana, mushrooms and bamboo shoots are included.

Landownership rests with the community, the entire village land belonging to the clan. Now, there are individual properties coexisting with village-owned land. Both the Wanchos and the Noctes are organised around their tribal chiefs. The chief of the Wanchos is *Wangham* who considers himself above the clan and does not dine with *Wangpan*, the commoners. Similarly, Noctes also have their chief called *Lowang*. The Nocte society is divided into two groups, the *Lowangiat* which includes the chief and his descendents and *Sanajat*, the commoners. Though such a hierarchy does not exist under the law of the land, it continues as a social tradition. All clans in Tirap region are exogamous. The clan distinction is very strong among the Wanchos.

While the Wanchos and Tangsas retain their tribal way of life, the Noctes have turned to Hinduism under the influence of Vaishnavite saint Sankardeb. About two-thirds of the total Nocte population has adopted Hinduism as their faith. They don't eat beef and follow some of the Hindu rituals. The Wanchos have different belief system and celebrate '*ojala*', the most popular festival for the community in the month of March and April. Both Wanchos and Noctes are good at wood carving and other handicrafts.

11.4.1.2 The Tribes of West Arunachal Pradesh

Western part of Arunachal is represented by three districts: East Kameng, West Kameng and Tawang. The tribal realm of East Kameng is a westward continuation of Lower Subansiri region, dominated by Nishis. East Kameng has an overwhelming presence of Daflas, Nishis and Bangnis with some elements of Sulungs, discussed earlier.

Photo 11.2 A Monpa Family visiting the monastery at Tawang, Arunachal Pradesh

Monpas and Sherdupkens

The western part of Arunachal Pradesh – West Kameng and Tawang districts – is inhabited by several communities, the chief among them being the Monpas and Sherdupkens. The *Monpas* occupy the northern part of the area ranging in altitude from 1,500 to 4,000 m ASL, the area between Bomdila and Tawang (Photo 11.2). They follow a kind of crude Mahayan Buddhism, oriented to the great monastery of Tawang built in the early seventeenth century. Forced by undulating hilly terrain, they practise terrace cultivation and, taking advantage of height and a low level of evaporation, grow a variety of crops like barley, wheat, maize and potatoes and many vegetables. In addition, they rear yak, horse and sheep. Good at making carpets, the Monpas are quiet and gentle and have special taste for flower decoration and woodcarving. They love music and dance. Their houses are made of stone or wood with wooden floor on raised platform. They have a chief for each village known as *Tsorgen* elected by all the adults of the village. The Monpas are also good traders and were formerly transiting between Tibet and Assam, but this practice is now discontinued following border restrictions and all weather transport network development linking Tawang and the Brahmaputra plain.

South of the zone inhabited by Monpas is another tribal community known as *Sherdupkens*. These are the people who migrate south to the plains during winter. They are very good carpenters. This is a small tribe, their population not exceeding 10,000 persons. In contrast, the Monpas are the largest tribal group in West Kameng–Tawang region with a population of over 40,000 people. Besides, there are other small tribal groups in the area, like Mijis, Dhammais and Khowas.

Photo 11.3 Ladies belonging to the Apatani tribe in their traditional wear (at Ziro, Lower Subanseri district, Arunachal Pradesh) (Photo S. R. Jog)

The Akas

A non-Buddhist tribe, Akas, occupies the area east and south of Bomdila, bordering with the East Kameng district, which is dominated by Bangni with some elements of Sulung tribe. Now confined to an area of about 300 km^2, Akas are settled both on the hilltops and in the valley. They call themselves Hrasso, the name was given to them by the plains' people (Sinha 1962). Expert in making suspension bridges, they are good at bamboo craft, particularly basketry. They practise shifting cultivation (*jhum*) and used to live in huts which are now upgraded. Akas villages are not large and most have 20–25 houses. Fond of a kind of liquor called '*Lao-pani*' distilled from maize and millet, they also indulge in smoking for which they use bamboo pipes. Their supreme deity is *Tcharo.* The British branded them as a 'thieving tribe' and used to pay *posa*, appeasement money, to keep them at bay from the Assam plain.

The Apatanis

A very progressive tribal community settled in the vicinity of Ziro, the headquarters of Lower Subansiri district, is known for its unusual skill in water management and cultivation of wet rice (Photo 11.3). In this, the community is helped by the remarkably flat plateau of Paholi at a height of 1,580 m ASL. The small enclave of Apatanis surrounded by Nishis is separated from the latter by what is locally known as

Joram top (1,740 m ASL). The Apatanis live in large villages with around 4,000 houses, 'almost towns with labyrinths of densely crowded streets' (Fürer-Haimendorf 1946). The village nearest to Ziro is *Hari*, at the foot of the hill, overlooking the flat paddy fields. To reach the village, one has to cross the intervening paddy fields from Ziro, on a badly maintained road. The houses, on low stilts often less than a metre in height, line the central street on either side. Made of bamboo and wood, these are approached by a wooden ladder fixed against the house or by a permanent RCC staircase. A large rectangular platform, mounted on metre-high wooden pillars, serves as the meeting ground for the community.

The Apatanis, with a population of 27,576 (2001), occupy a relatively small area and depend on intensive cultivation of wet rice. In fact, they are surrounded on all sides by Nishis. The highlands on the silt-filled depression, covered with bamboo at lower levels and pine stands at higher altitude, provide the hunting ground for the community. Apatanis have attained enormous progress in education in the last 50 years.

11.4.2 The Nontribal Population of Arunachal Pradesh

As stated earlier the tribal communities of Arunachal Pradesh account for only 65 % of its population; the remaining 35 % is composed of immigrant population without a domicile status engaged in administration and development work of the state. Many of the small enterprises like shops, hotels or transport services are run by non-Arunachalees. And, even the government institutions like schools, colleges and hospitals are largely managed by people from outside the state. Most government departments, starting from Public Works, Revenue, Education, Forestry, Agriculture or any other, depend heavily on immigrants who, after completing their tenure, return to their home state. There are, of course, a few who were settled there even before the formation of North-East Frontier Agency, or the State of Arunachal Pradesh, and claim domicile status and even own some property. The rest are all stateless workers.

11.4.2.1 The Three Principal Immigrant Groups

Among the immigrants in Arunachal Pradesh, the three linguistic groups, viz. Bengali, Nepali and Hindi, account for one-fourth of the total population of the state, and only Nishi/Dafla and Adi groups of tribal communities surpass in strength any of the above linguistic group. The first twelve linguistic groups of Arunachal, which each have a population of more than 10,000, are given in Table 11.4.

The first 12 linguistic groups account for 87.8 % of the total population of the state, of which Bengali, Nepali, Hindi and Assamese, together, make around 30 %.

Table 11.4 Linguistic groups of Arunachal Pradesh (2001)

No.	Language	No. of persons speaking the language as their mother tongue (2001)	Percentage of people
1.	Nissi/Dafla	208,337	18.97
2.	Adi	193,379	17.61
3.	Bengali	97,149	8.85
4.	Nepali	94,919	8.64
5.	Hindi	81,186	7.39
6.	Monpas	55,428	5.05
7.	Assamese	51,551	4.70
8.	Wanchos	48,544	4.42
9.	Tangsas	34,231	3.12
10.	Mishmis	33,522	3.05
11.	Miri/Mishing	33,381	3.04
12.	Nocte	32,591	2.97
13.	Tibetan	9,537	0.87
14.	Oriya	7,847	0.71
15.	Bodo	6,515	0.59
16.	Other languages	109,861	10.01
Total		**1,097,868**	**100.00**

Source: Census of India (2001), Languages Statement 9:25

Though Assam is the adjacent state of Arunachal, the strength of Assamese-speaking people is less than those who speak Bengali, Nepali or Hindi as their mother tongue. The dominance of Bengali in the immigrant population could have resulted from their migration from Assam where they were settled for over a century and could easily secure a job in the newly set-up administration of Arunachal Pradesh or could engage in a small yet secure enterprise. The case of Nepalis requires special mention. Accustomed to hardwork in the mountainous Himalayan region, they have migrated along the Himalayan foothills dominating Sikkim and establishing their foothold in the states of North-East India. They are far more numerous in Assam with a population of more than half a million, but in terms of relative concentration, they are well entrenched in Arunachal, where the Nepalis form over 8 % of the population of the state. The Nepalis practise farming, run transport business, take jobs requiring hard labour and indulge in cattle breeding and dairying wherever possible.

A lower population of Assamese-speaking people as compared to those having Bengali or Nepali as their mother tongue, despite their proximity to Assam, reflects the unwillingness to move out of their state as much as the easy availability of jobs in their home state.

The immigrant population has a relatively higher concentration in the towns. The Bengali-, Nepali-, Hindi- and Assamese-speaking people have a concentration of 32.5, 26.1, 47.1 and 36.4 %, respectively, in urban areas, as compared to 27 % Nissis and 14 % Adis living in the towns.

11.4.3 The Tibetan Refugees

Besides the indigenous tribal population and the immigrant workers, the latter without any domicile status, there are Tibetan refugees settled in Tirap district. Neither assimilated nor accepted in the regional tribal society, despite their mongoloid roots, the Tibetan refugees have been able to organise themselves in a well-knit group and practise farming and manufacture handicrafts. There were also Chakma refugees besides the Tibetan, but the latter have since been partially repatriated to Bangladesh, from where they were displaced.

11.5 The People of Nagaland

Nagaland, with a population of around two million (1,980,602) in 2011, is almost exclusively inhabited by tribal people, commonly known as the Nagas who form 90 % of the state's population. The remaining 10 % is constituted by Bengali-, Hindi- and Nepali-speaking people who are either engaged in small enterprises or employed by the government and nongovernmental institutions. A large part of the nontribal population is centred in Dimapur, the main trade and transport centre of Nagaland.

The tribal population of the state is predominantly made of Nagas, with a number of subtribes. Usually, every single member of the Naga tribe carries a suffix that is specific to his tribe, like Ao, Konyak and Angami. The title Naga is an umbrella term signifying a collective identity. It must be made clear that besides over 1.8 million Nagas of Nagaland, there is an additional population of Nagas, in their various subgroups in the neighbouring state of Manipur and border areas of Assam.

The word 'Naga' 'is quite foreign to and unrecognised by the Nagas themselves'. Thus wrote Lt. Col. R. G. Woodthorpe in 1882. According to him, 'a Naga when asked who he is, generally replies that he is of such and such village, though sometimes a specific name is given to a group of villages'. The situation has since changed, and though the term 'Naga' may have been used by the plains' people, its use is firmly established today in the society, government and even internationally. No other community in the North-East has attracted as much attention as the Nagas and there exists a substantial volume of literature on the Nagas and even Nagaland. One may group the writings on the Nagas in three categories:

1. Books and articles written by early British administrators and army officers who emphasised the unruly nature and the savagery and violence practised by Nagas.
2. The second group of authors were those who were local administrators in Nagaland like J. H. Hutton and J. P. Mills, both Deputy Commissioners in Nagaland, at one time or other. They had an academic interest in the social organisation and economic practices of these people, besides being their administrative guardians, and wrote treatises, which are relevant even to this day.
3. Anthropologists who studied the Naga groups objectively and even compassionately. Christoph von Fürer-Haimendorf and Verrier Elwin come in this category.

While Fürer-Haimendorf, an academic and an anthropologist, wrote about the Nagas, particularly their social life and rituals, he was equally interested in curios from Nagaland. Undoubtedly, Elwin had a fountain of compassion for the tribals and wrote about Nagas, their art and culture. Contemporary authors have engaged themselves in understanding the past colonial period. Gundevia's *War and Peace in Nagaland* (1975) and Mankekar's *On the Slippery Slope in Nagaland* (1967) are two works that easily come to the mind.

Our opinion of the Nagas, influenced as it is by volumes of earlier writings and their current movement, for a greater Nagaland with some elements of sovereignty that started with the violent struggle is likely to be not only partial but even subjective and biased. But leaving aside the political dimensions of the present Naga imbroglio, if one looks at the Nagas simply as a people, one cannot be but impressed with the degree of social and cultural transformation that the community has undergone during the last 50 years.

Once existing in perpetual feud with the neighbouring village or the clan, and always revengeful, the Nagas today are an organised society. They are no longer the dreaded head hunters of yesteryears. Influenced deeply by American Baptist missionaries during the late nineteenth and twentieth century, the Nagas gradually embraced Christianity, adopted the ethics and culture of their newly acquired faith, gave up traditional head hunting and created a social organisation that is much in tune with modern human values. Though a part of the new administrative set-up under the Indian Constitution, they still have their chiefs, clan relationships and a cooperative spirit that helps them develop the resources of the region and lead a better economic life. Many traditional institutions that fostered cooperative spirit in the community still persist, and the cultural practices that were the hallmark of a community have been retained. Yet, the benefits of modern education, better healthcare and an elaborate administrative organisation have transformed the Naga society altogether. Nagas are no longer a tribal cabal of head hunters. They are a vibrant community looking to the future with their hopes and inspirations.

11.5.1 Subtribes Among the Nagas

Despite all the achievements, the original divisions of the community still exist, each group speaking its own language, having its own style of dress, social customs and rituals and jealously guarding its identity. There are many subtribes among the Nagas, of which 15 figure prominently in records (Fig. 11.3). What is significant is that each of these subtribes occupies a specific area, a niche, which is its exclusive domain. The numerical strength of each tribe and areas of concentration is given in tabular form in Table 11.5.

Nagaland is a single-tribe territory and is almost exclusively inhabited by Nagas though with a multiplicity of subtribes, often at odds with each other. In fact, in the assessment of early British administrators 'the Naga hills were long known as abode of the fierce and intractable warfare and asserting their presence on our border by

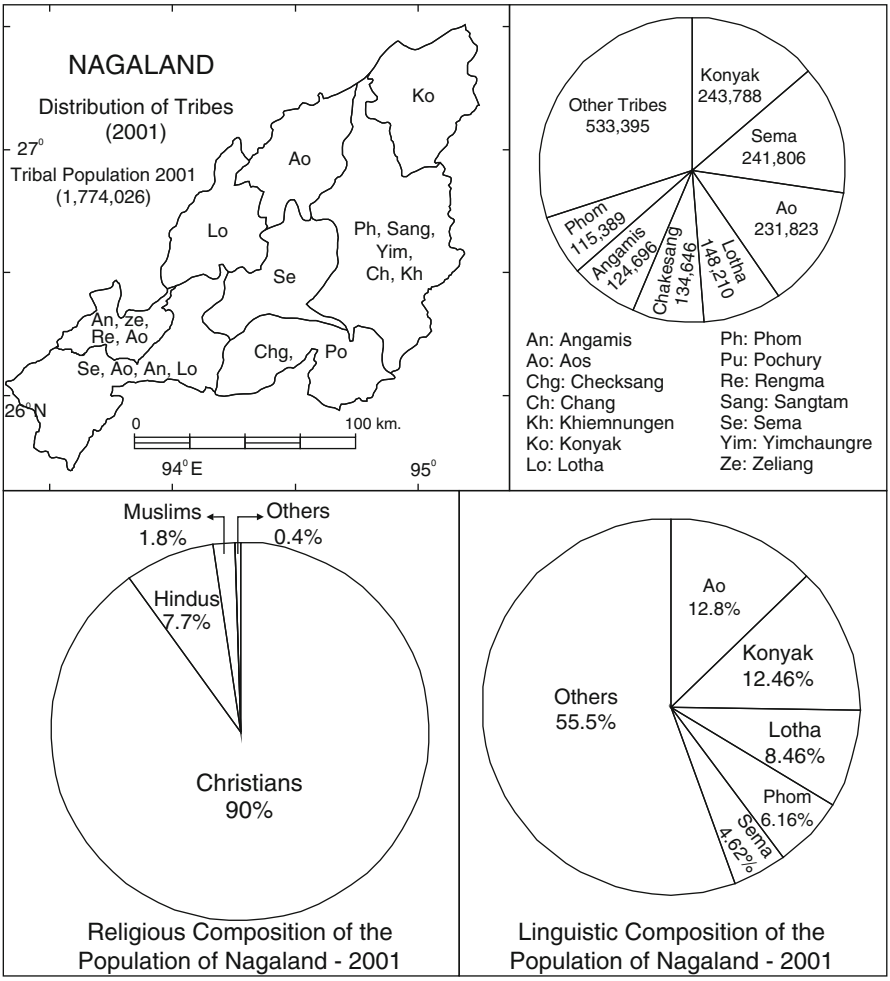

Fig. 11.3 District-wise distribution of different scheduled tribes of Nagaland: their religious and linguistic composition (as per the Census of India-2001)

savage raids' (Godden 1897). The isolation of Nagaland and the individual subtribe is attributed to the hilly and dissected terrain. While the Naga upland is separated from Brahmaputra valley by a steep scarp, generated by NE–SW-oriented Naga–Disang fault, the highland itself is dissected by a number of north–south flowing rivers and their tributaries. Thus, each subtribe occupies a niche, which is distinct from its neighbour and separated from the latter by a river, steep hill slope and dense forest. Writing about the Nagas, Damant (1880) observed that 'there are no less, probable more than, thirty different tribes, all speaking different languages and mutually unintelligible, one to another. In some instances, perhaps a few may be reduced

Table 11.5 Strength of different tribes in Nagaland (2001)

Tribe's name	Strength in Nagaland	Percentage of the total population of Nagaland	District(s) where most concentrated
1. Konyak	243,758	14.0	Mon
2. Sema	241,806	13.8	Zunheboto, Kohima, Tuensang
3. Ao	231,823	13.3	Mokokchung dist., Kohima
4. Lotha	148,210	8.50	Wokha, Kohima
5. Chakesang	134,648	7.73	Phek, Kohima
6. Angami	124,696	7.15	Kohima district
7. Phom	115,389	6.62	Tuensang
8. Sangtam	83,714	4.80	Tuensang
9. Yimchunger	75,983	4.36	Tuensang
10. Zeliang	71,871	4.12	Kohima
11. Chang	60,885	3.49	Tuensang
12. Rengma	50,966	2.92	Kohima
13. Khiamniungan	38,137	2.18	Tuensang
14. Pochury	15.908	0.91	Phek
15. Tikhir	10,377	0.60	
Other Nagas	93,621	5.36	
Total Naga tribes in Nagaland	1,741,692	99.92	

Source: Primary Census Abstract for Individual Scheduled Tribes 2001, Census of India 2001
This is the strength of Naga tribes as it occurs in Nagaland. There are Nagas in adjacent states like Manipur and Arunachal Pradesh

to the rank of dialects, but in the majority of the cases they are essentially distinct languages, and often no connection or similarity is to be found between them'.

The Nagas attained a sense of oneness among themselves and developed a unified identity after the arrival of American missionary, Baptist Rev. Clark; the establishment of American Baptist church in the village Molung Yimchen in 1874; and the American Baptist Mission, with headquarters at Impur in 1894. The propagation of Christianity induced a feeling of brotherhood among different subtribes. Active support to the British war effort and participation in the battle of Kohima, during the closing years of Second World War, further brought the warring groups together. The establishment of British administration reduced the tribes to a common denominator as the subject of the British crown. In the closing years of the colonial rule, the British officials helped the Nagas to come together first as 'Naga Club' (1918), then later as members of National Naga Council, NNC (1946), promoted by C. L. Pawsey, the last Deputy Commissioner of Naga Hills district. The Naga separatist movement launched by NNC under the leadership of Z. Phizo, an Angami, further strengthened unity among the Nagas. There was a common cause of secession from India and the foundation of an independent sovereign Nagaland for which all Naga groups had to stand united; and this gave birth to the idea of 'Nagalim' (Naga nation).

Today, though the primordial loyalties to a clan exist, there is realisation of an underlying unity of different groups. The awareness brought about by a sovereign Nagaland movement evolved into a fierce patriotism that aimed at a larger reality: that is, 'Nagalim'. Today Naga, Nagaland and Nagalim are far more significant than an individual tribe like Ao, Sema or Konyak.

It needs to be mentioned here that Nagas as a people are not confined to Nagaland alone, but spread in other areas notably the northern districts of Manipur state. The contemporary political movement that brings the people together aims at the 'integration of Naga people' and a Greater Nagaland that is designed to include some border areas of Assam, Arunachal and a large part of Manipur. Whether this dream of the Naga people will ever materialise is an open question; what the movement has achieved is some semblance of unity among them.

11.5.2 Individual Naga Tribes

11.5.2.1 The Aos

The largest (231,823 in 2001) and the most progressive of the Naga tribes, Aos, constituting roughly 13 % of the Naga population of the state, are largely confined to Mokokchung district of Nagaland, between the river Dikhu on the east and Disang on the west. The word '*Ao*' is used for those who arrived here from the east crossing the river Dikhu (Singh 1998). Divided into three groups, viz. Chongli, Mongsen and Chanki, the community is composed of a number of '*chars*' or clans like Amang, Atang and Jamir. The clans regulate the social life of the community and partially manage the distribution of land, specially the area that is subjected to shifting cultivation. Settled on a height above 1,000 m ASL, the Aos enjoy a pleasant weather and grow a variety of crops like millets, pulses, soya beans, cotton, ginger and chilly, besides upland and wet paddy. Mokokchung (31,204 population) is the cultural seat of the community. The Aos have a high literacy rate of over 75 %, and they benefitted from a number of educational institutions. A large number of them have entered government service. It is to be noted that the first American Baptist mission was established in the vicinity of Mokokchung and Aos could not have remained untouched by the moderating influence of Christianity. This is reflected in the fact that more than 90 % of the Aos have embraced Christianity as their faith. The Ao villages are usually medium sized, often not exceeding 500 persons. But a few like Suruboto, Akuloto, Atoizu, Satoi, Aitepyong or Pangti are large with a population of over 1,000. Each village is surrounded by a belt of bamboo clumps und jungle. The main path to an Ao village, following the ridge crest and flanked on both sides by tall trees, approaches the village through a gate. The village street is usually narrow. Every Ao village[6] has its 'park lane',

[6] The description of the Ao village is based on Wanghshimenla (2002).

usually the top of the ridge, where the rich live. The poorer people live in the houses on the slopes on either side and the widows on the outskirts of the village. Lower down the slopes, sufficiently remote to ensure their safety, should the village catch fire, are the granaries, little miniature houses raised two or three feet above the ground on piles (Wanghshimenla 2002).

An Ao village is divided into '*mephus*' or '*khels*', based on clan relationship or linguistic affinity. *Morung*, the bachelors' dormitory, is a common feature of every village. Like other Naga groups, the Aos practice *jhum* or shifting cultivation, keeping the land successively cropped for 2 years, and fallow for 10–15 years. The villages have a cooperative spirit as can be witnessed during agricultural operations. The Aos have a community council called '*Puthu-Mendey*' that regulates social affairs and settles disputes. The traditional festivals like '*Moatsu*' are still celebrated with as much enthusiasm as Christmas.

The Konyaks

The Konyaks (population – 243,758 in 2001), the largest tribal group in Nagaland, occupy the northern extremity of Nagaland, coinciding with Mon district, where 99 % of the Konyaks are clustered. Accounting for 14 % of the population of the state, Konyaks have not moved out of their territory. One may remind the readers that Christoph von Fürer-Haimendorf, anthropologist from the School of Oriental and African Studies, London, who authored *Naked Nagas* worked in the Konyak territory with his office in Wakching, not too far from the nearest railhead, and the book is the narrative of Konyak Nagas as he observed them in day-to-day life. It may be mentioned that he had a huge collection of Naga artefacts and curios including skulls and log drums. There are several photographs of bare-breasted Konyak girls that he inserted in the book to justify the title of the book.

Like the Aos, the Konyaks have embraced Christianity in large number. The route from Sibsagar to Mokokchung passes through Konyak territory and they were equally influenced by the services of the Baptist mission as the Aos. The Konyaks are exogenous and monogamy is the rule among them. The Konyak chiefs exercise considerable power over the clan. *Wang haymien*, the village council, regulates social interaction and marriages. Agriculture is the main occupation. The Konyaks, instead of being an egalitarian society as expected, maintain some degree of a hierarchical order, the most common divisions being the '*angs*', the aristocrats and the commoners. Besides jhuming that is common, terrace cultivation and wet paddy cultivation are practised in Dikhu valley that forms the western fringe of Konyak territory. Poultry, weaving, piggery and carpentry are other occupations of Konyaks. Being migrants from the southeast the Konyaks are a constituent unit of the group known as the Eastern Nagas. Being in closer contact with the plains people, they maintain neighbourly relations with the people in Sibsagar district in Assam. It is believed that one of the Ahoms had married a Naga girl from the place now called Naginimara, a railway terminus, linked with Sibsagar by metre gauge North-Eastern railway extension.

11.5.2.2 The Lothas

The Lothas are numerically the fourth important tribal group in Nagaland, comprising over 8 % of the state's Naga population. They are the predominant group in Wokha district, lying between Mokokchung in the north and Kohima in the south. Also known as '*Kyon*', the Sema Nagas call them '*Chuwami*'. There is a tradition that Lothas, Semas, Rengmas and Angamis have a common ancestry. Divided into two territorial groups, northerners and southerners, they believe in ancestral worship and death rituals. The river Diyong, which flows through Wokha, the Lotha territory, provides easy access to this group to promote contact with the plains people. Lothas have, thus, had close links with Ahoms as well as with other non-Naga communities. They have used the hill slopes for horticulture and practise some wet cultivation of rice besides traditional jhum. Monogamy is usually followed, but polygamy is tolerated. The population of Lothas in 2001 was 148,210, with around 90 % in Wokha district and the remaining 10 % settled in the neighbouring district of Kohima. Surprisingly, the Lothas have moved south to the capital region of Kohima and not to the north. They along with the district are known for horticulture producing oranges and pineapples.

11.5.2.3 The Angamis

Though numerically not as strong as several other Naga tribes, the Angamis have had more than their share of participation in the political upheaval that the state has witnessed ever since its inception. Distributed around Kohima region, the southern part of Nagaland, the Angamis, of all Nagas, are more warlike and resisted the British advance and thwarted their attempts to subjugate them for over four decades. They fought valiantly to protect their village Khonoma in an uprising in 1879. No doubt, they had to surrender later before an overwhelming British onslaught, yet they remained defiant and retained a sense of pride in their warrior-like qualities and heroism. Undoubtedly, the traditional Naga practices of raiding villages and head-hunting were common before the British established their rule and persisted for long; the situation today is very different. The old savagery no longer exists and the spread of education and the teaching of the Church have completely transformed the Angamis that were once considered ferocious and blood thirsty[7] into a forward looking progressive society (Photo 11.4).

An interesting account of Angami Nagas, as they existed in 1875 is given by Butler. 'The Angamis as a rule are taller than an average Naga. His complexion is comparatively fairer, though with various shades of brown – from ruddy and light to olive to red Indian and dark brown. But there are no black Nagas'. Butler described 'the men of upper ranges almost handsome and some of whom might be even

[7] For an account of Angami tribe, the reader is referred to J. B. S. C. Butler (1875).

Photo 11.4 An Angami Naga with his traditional hand-woven shawl at Khonoma near Kohima

called pretty …The women are taller than other hill women' (Butler 1875:313). The traditional Angami dress consisted of a broad band of cloth, blue or black, ornamented with three rows of 'cowries' (shells) wrapped around the body. Women wear plain skirts. Angami villages have been traditionally very large for reasons of defence and offence. Kohima, the principal Angami village in the nineteenth century, had around 900 houses (Woodthorpe 1882). These were built on commanding positions and strongly fortified. Even today, the Angami region has large villages. The *Khonoma* village, a monument to Angami resistance and valour, is quite large and presently appears a heritage site with memorials built in honour of the heroes of resistance. The houses are large 10–20 m in length and 6–12 m in width with gabled roofs. The Angamis grow a variety of crops like rice, peas, millets, yam, chillies, ginger, garlic, pumpkin, other vegetables and maize, and they breed pigs, goats, dogs and fowl and occasionally cows for food. Among the Nagas, Angamis are the leaders in terrace farming. One can see them on the valley side slopes while travelling from Kohima to Khonoma village, about 25 km away. The village is a success story of terrace cultivation in Nagaland.

Traditionally, the Angamis had their village chiefs, known as *Peumas* whose authority was only nominal, though they used to arbitrate between warring families. Angamis have several groups, the chief among them are the following (Singh 1988):

1. Tengima – The western Angamis. They consider themselves as real Angamis.
2. Northern Angamis
3. Zounuo
4. Keyhonuo

Other names of Angamis are Monr and Tsungumi.

The Angamis, particularly the western Angamis, are not so fond of smoke but like to drink *Dzu*, a kind of fermented beer. Even the women and children show fondness for *Dzu*. Burial is a common practice among the Angamis, with tombstones, which used to be wooden blocks with rudely carved busts of the dead.

11.5.2.4 The Semas

With a population of 241,806 (2001), Semas are the second largest tribal group in Nagaland. They account for over 13 % of the Naga population of the state. Unlike the Aos, Angamis and the Lothas who are restricted to Mokokchung, Kohima and Wokha, respectively, the Sema are more widespread with their main concentration in Zunheboto district to the extent of 60 %, with another 30 % in Kohima and the remaining in Tuensang district. The community calls itself '*Semi*' after their ancestor Sumi who is believed to have entered the Mao area of Manipur from the east and then settled in Khezo-Kenoma. In a second wave of migration, they came to Zunheboto. They followed Doyang valley and came to their present habitat. The Semas use *sema*, *sumi* or *swu* as their surnames (Hutton 1921b).

Semas are a very sturdy community. During the colonial period, many of them migrated to Assam as labour to clear the forests and construct roads. Their usual occupation is shifting cultivation, with occasional terrace cultivation, besides animal husbandry, weaving, basketry and smithy as second occupation. Many Semas were also recruited during the Second World War. Polygamy is common in the community and the dead are given a normal burial. The hereditary chieftainship exists only in name, and its place is now taken over by village Panchayats. The Semas have their own dialect called 'Sema' after the community.

11.5.2.5 Chakesang Nagas

The Chakesangs represent a combined group of three tribes, viz. Chakhru, Kheza and Sangtam; each group speaks its own individual dialect a nonscheduled language. Of these, Sangtam and Chakhru are numerically more important than Kheza. In order to get the development benefits, these tribes united themselves (Singh 1988).

Table 11.6 District of concentration of Naga communities without exclusive domain

Tribal community	Population 2001	District of their concentration	Percentage of the community residing in the district
1. Sangtam	83,714	Tuensang	96
2. Phom	115,389	Tuensang	97
3. Chang	60,885	Tuensang	94
4. Yimchunger	75,983	Tuensang	96
5. Zeliang	71,871	Kohima	99
6. Khiamniungan	38,137	Tuensang	99

Source: Primary Census Abstract for Individual Scheduled Tribes 2001, Census of India 2001

The Chakesangs are exclusively confined to Phek district of Nagaland with some spill-over of the community into Kohima, the neighbouring district, the latter being adjacent to Phek besides being the state capital. They are monogamous. The resources of the area like land, forests and water are controlled and regulated by the village clan. The annual terrace cultivation is often an individual enterprise. Shifting cultivation is still very important; however, secondary occupations like animal husbandry and horticulture are becoming progressively more significant.

11.5.2.6 Other Naga Communities

Besides the Naga groups discussed above, there are several other Naga communities, which do not have an exclusive domain of their own and share the territorial space with other communities, yet they guard their identity (Table 11.6). Many of these are concentrated in Tuensang district.

11.5.3 Eastern Nagaland, the Area with Multiple Communities

The eastern part of Nagaland is higher, colder and more dissected than the western region. It remained for long ungoverned by the British Government, though they controlled the area and mounted punitive expedition whenever their authority was challenged. Most of the Naga tribes favoured the western fringe of what was then known as Naga Hills, as it provided better conditions for shifting cultivation and easy access to the Brahmaputra plain. The space in the eastern part of the state was shared by communities arriving successively from east and each developing a cluster of its own clan villages. Thus, Sangtam, Phom, Chang, Yimchunger and Khiamniungan each have a small clan territory of its own, but all these subtribes remain confined to the eastern fringe as any movement further west was resisted by the settled groups of Aos, Lothas and Angamis. Most administrators, surveyors and other public servants remained engaged with the area and the communities of West Naga Hills and virtually ignored the Eastern Naga groups, leaving the area untouched and undeveloped. These tribes continued internecine wars, headhunting and having

a primitive way of life for a much longer time. Besides the well-recognised Naga tribes, a few non-Naga tribes like the Kukis and Kacharis have also settled in Nagaland, but they remain confined to southwest margin of the state in Dimapur and Kohima districts.

11.5.4 Nontribal Population of Nagaland

About 10 % of the population of Nagaland does not fall in the category of tribes. These include the traders, public servants, professionals and others employed in private sector as casual labour. A large section of this nontribal population is concentred in Dimapur, composed largely of Marwari traders, Hindi-speaking wage earners, transport service operators and restaurateurs who account for 40 % of the population of the town. More spectacular is the dominance of Marwaris, Bengalis, Biharis and Assamese who together not only add up to over 60 % of the population of the town but also run most of the economic activities. Even in Kohima there is a substantial presence of the non-Naga communities, obviously, the impact of Kohima, the capital of the state.

11.6 People of Manipur

Unlike Nagaland and Mizoram, the two peripheral states, almost exclusively inhabited by tribal population, Manipur has two well-differentiated groups of people; the tribes spread over the sparsely peopled areas of the hills and the nontribal population occupying the Imphal valley, the central plain of Manipur. The tribal population comprising principally the Nagas and Kukis, which constitute 40 % of the population of the state, are sparsely distributed in the hilly and forested areas with a density of not more than 45 persons to a km^2. In contrast, the nontribal population forming 60 % of the total population of Manipur is virtually crowded in the Imphal plain that covers only 10 % of the area of the state.

The tribal and nontribal populations are differentiated not only socially but even territorially. The five districts of Ukrul, Senapati, Tamenglong, Churachandpur and Chandel are almost exclusively inhabited by Scheduled Tribes, and the valley districts of Imphal East, Imphal West, Bishnupur and Thoubal are occupied by Meitheis, the principal nontribal group of the state that follows Hinduism. Secondly, a large majority of the tribal groups have embraced Christianity symbolised by many small unpretentious chapels appearing in the hilly rural landscape of Manipur. The Meitheis of the valley, on the other hand, close to the seat of power at Imphal, enjoying the benefits of royal patronage and exploiting the rich land resources of the valley revelled in their cultural heritage with their dance, drama, music and the worship of Govindraj, a Vaishnavite Hindu deity.

Table 11.7 The principal tribes of Manipur with the population

Tribe	Population (2001)	Districts of their concentration in order of importance
1. Thadou (a Kuki tribe)	182,594	Senapati, Churachandpur and Chandel
2. Tankhul (a Naga tribe)	146,075	Ukhrul
3. Kabui (a Naga tribe)	82,386	Tamenglong, Imphal West
4. Paite (a Kuki tribe)	49,271	Churachandpur
5. Hmar	42,933	Churachandpur
6. Kacha Nagad	42,013	Tamenglong
7. Vaiphui	38,267	Chandel
8. Maring	23,238	Churchandpur
9. Anal	21,242	Chandel
10. Zou	20,567	Churachandpur

Source: Primary Census Abstract for Individual Scheduled Tribes 2001, Census of India 2001

11.6.1 The Tribes of Manipur

Officially, there are 22 Scheduled Tribes in Manipur, many of these being a subtribe of a larger group. For convenience, one may divide the tribes of Manipur into three groups:

1. Nagas
2. Kukis and associated tribes
3. Others

In a general distributional pattern (Table 11.7), the Nagas occupy the north-eastern and north-western parts of Manipur, whereas the Kukis are settled in the central and southwestern parts of the state (Fig. 11.4).

11.6.1.1 The Nagas of Manipur

More than half of the tribal population of Manipur is composed of Nagas who occupy the three northern districts, Ukhrul, Senapati and Tamenglong, all of them continuous to and sharing their boundary with the state of Nagaland. In fact, the northern half of Manipur appears the southern extension of Naga belt which spreads from Tirap district of Arunachal Pradesh southward, till it encounters the Kukis in the southwest and Meitheis in the central part of Manipur. It appears strange that there is no social transition between the northern Naga territory and the central plain of Manipur as exemplified by Ukhrul and Imphal East districts. The Tangkhul settlements of Ukhrul abruptly disappear with the arrival of Imphal East border, their place being taken by Meithei farmers of wet rice cultivation.

The Nagas of northern Manipur identify themselves with the Nagas of Nagaland not only ethnically but even emotionally and politically, and a greater *Nagalim* is as much a cause celebre, for them, as it is for the Nagas of Nagaland. This, despite the

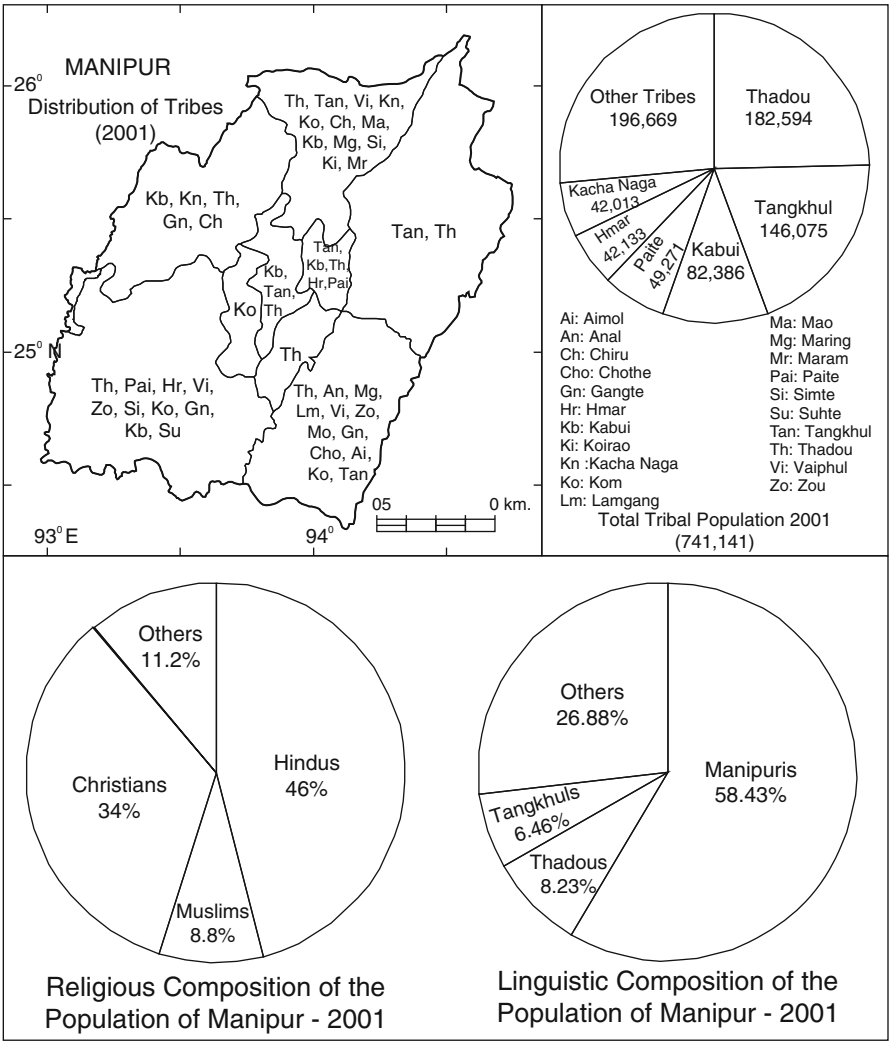

Fig. 11.4 District-wise distribution of different scheduled tribes of Manipur: their linguistic and religious composition (as per the Census of India-2001)

fact that none of the major Naga groups of Manipur, like Tangkhul, Kabui, Mao, Maram and Kom have a significant presence in Nagaland. Centuries of neglect and persecution of the tribal communities by the rulers of Manipur led them to seek an alternative, which they found in the new faith, the Christianity, which they embraced at the first appearance of Christian missionaries. There has, over the decades and centuries, developed a wide chasm between the Nagas of northern Manipur depending on shifting cultivation and the Meitheis who owned rich rice land of the valley and held administrative positions in the state because of their proximity to the

Table 11.8 Principal Naga tribes of Manipur

District	Tribes with their population in 2001
1. Ukhrul	Tangkhul (123,035), Vaiphui
2. Senapati	Tangkhul (8,329), Mao, Thandon (a Kuki tribe) and Maram
3. Tamenglong	Kabui (60,893), Kacha Nagas (34,368)

Source: Primary Census Abstract for Individual Scheduled Tribes 2001, Census of India 2001

ruling elite. Even the governance of the state under Indian Constitution that assures equality has not changed the situation much. The Nagas nurture serious grievances and are not reconciled to a situation of domination of the Meitheis.

Some Principal Naga Tribes of Manipur

Naga tribes of Manipur, confined to the northern half of the state, are Tangkhul, Kabui, Kacha Nagas, Mao, Maram, Pom and Maring. The important Naga tribes of the three northern districts of the state are as follows (Table 11.8).

The Tangkhuls

With a population of 146,075 people (2001), the Tangkhuls are the largest Naga group in Manipur. Largely confined to the hilly tract of Ukhrul district with some spill-over in Senapati district, Tangkhuls are the most enterprising Naga community. There are several clans among Tangkhuls, which they use as their surnames often ending with *nao*, like Keishingnao. They are normally monogamous and bury their dead. Tangkhuls are the leaders in terrace cultivation and it is quite likely that the Angamis of Nagaland learnt terrace cultivation from them. Good at weaving, they produce very artistic blankets. Traditional village councils still exist among the Tangkhuls, who settle feuds and adjudicate in other matters of importance to the community. They speak their own language 'Tangkhul'. Education is fast spreading in the community and bringing awareness about their rights.

Maos

The second largest Naga tribal group of Manipur is almost entirely concentrated in the hilly areas of Senapati district, forming the border with Nagaland. According to Singh (1988), the word Mao is derived from 'Maomei' meaning people of the north. In an ideal situation, the Maos practise monogamy, and burial of dead is universal. Terrace rice cultivation is common. The community is governed by a council with members from different *Khels* and a chief called *Segung*. The community practises animal husbandry besides pig rearing. Some Tangkhuls and Marans also share space with the Maos, though they are not as numerous as the Maos in Senapati district. In view of their concentration in a specific area of Senapati, a subdivision is named as Mao-Maram.

Kabui Nagas

Kabui Nagas – also known as 'Rongmei', people from south, are largely concentrated in the northwest region of Manipur coinciding with the present Tamenglong district. A small section of Kabui has also moved to Imphal valley in the centre of the state. The community reveres '*mithun*' and rears them. They are divided into several clans like 'Kamei', 'Gonmei' and 'Lanmei'. They speak traditional Kabui and have retained the tradition in which the clan elders still regulate the affairs of the community.

11.6.1.2 The Non-Naga Tribes of Manipur

Besides the Nagas of Manipur discussed above, the rest of the population can be resolved into tribal and nontribal segments. The tribal groups, notably the Thadous, the Paites and the Hmars with some minor groups like Vaiphui, are concentrated in the west and southwest of the state.

The Thadous (A Kuki clan)

The Thadous are the largest non-Naga community in the state. With a population of about 200,000 people, they are agriculturists and practise both settled farming and shifting cultivation. One finds them more frequent in the western part of the state, specifically the districts of Senapati and Churachandpur which together account for over 60 % of Thadou settlements in the state. They have also made inroads in Chandel and Ukhrul districts. Besides speaking Thadou, their own language, many Thadous speak Mainpuri and use Bengali script for writing. The entire population of Thadous has adopted Christianity and presents a higher percentage of literacy as compared to other tribal communities of the state. They revolted against the British during 1917 and 1919, a fact of which they are proud.

The Paites

The Paites, a part of Kuki group, are largely concentrated in the hilly southwest area of the state, coinciding with Churachandpur district. With a strength of over 50,000 people, they form the second largest non-Naga tribal group. The system of chieftainship still exists in the community though the traditional authority of the institution is considerably diminished. Like the Thadous almost all Paites are Christians by faith. The community is believed to have been pushed from Mizoram and occupies the area contiguous to it. Paites have an associated subtribe called *Zous* which has kept a distinct identity despite the association and similarity with Paites. Paites are largely shifting cultivators.

The Hmars

The Hmars, though not confined to Manipur, have a significant presence in the state. They also inhabit some areas of North Cachar Hills, Cachar district in Assam and Aizawl district of Mizoram. With a population of over 40,000, they are concentrated in Churachandpur district with a miniscule number in Imphal valley. Like other tribal communities in the state, the Hmars have taken to Christianity in Manipur, though in North Cachar Hills and Cachar, they still follow the traditional tribal belief.

11.6.1.3 The Kukis

Kukis are the most widespread tribal community of the North-East. With the exception of Arunachal Pradesh, they are found in all other states of North-East India, having their highest concentration in Manipur where 40 % of the entire Kuki population is settled. In Manipur, Churachandpur district is the home of the first generation of Kukis who, it appears, arrived from Mizoram. From here, they migrated to other areas spreading northward into Senapati and eastward into Chandel, Ukhrul, Imphal and Bishnupur districts. The Kukis have 37 subgroups, and in Manipur, the list of Scheduled Tribes does not include Kukis, but only subtribes like the ubiquitous Thadous, Gangte, Kom, Lamgang, Paite, Baite, Simte, Vaiphei and Zou. Many of these subtribes like Thadous have their own language.

11.6.1.4 The Naga–Kuki–Paite Conflict

The often witnessed conflict between the Nagas and the Kukis and the Kukis and Paite is invariably linked to the possession of territory and land. The demand for sovereignty, even by small groups, is often rooted in the fear of their dispossession of land. Growth of population and comparative paucity of resources, more specifically of land, exacerbate the fear of the community resulting in ethnic clashes. The anger that at one stage might have been directed towards outsiders, locally called '*mayangs*', was at a later stage directed towards an ethnic group competing for common resources. The Naga–Kuki clash in northern and western Manipur extended to Churachandpur seen in a conflict between Kukis and Paites. The latter feared that they might be dominated by immigrating Thadous from the neighbouring districts.

11.6.2 The Nontribal People of Manipur: The People of Imphal Plain

The nontribal population of Manipur, consisting largely of Hindu Meitheis and some Muslims, is almost exclusively concentrated in Imphal valley that is spread over the four districts of Bishnupur, Thoubal, Imphal East and Imphal West, including

the Imphal urban agglomeration, the capital of the state. More than 95 % of the nontribal population of the state, numbering about a million and a half, is settled in these four districts, having a very high density of population (>630 persons/km^2), over 70 % of its land under net sown area and a high agricultural productivity. What is more remarkable is that these four districts, with only 10 % of the area of the state, accommodate two-thirds of its population.

In the tribal realm of the Indian eastern peripheral region, an island of Vaishnavite Hindus, the Meitheis, is part of the state's history which has witnessed domination of certain tribal groups, integration of some allied tribal communities, emergence of royalty and adoption of Hinduism as the religion of the state, followed by its subjects, all transformed over centuries into a contemporary society, a society that carries the tradition of the past and has adopted itself to the realities of modern democratic principles.

11.6.2.1 The Meitheis

The principal occupants of the valley are the *Meitheis* (*Meiteis*), an indigenous people, who in the course of history adopted Hinduism in the eighteenth century, during the reign of Gharib Newaz who himself had adopted Hinduism as did the majority of his subjects. The early record relating to Manipur and the Meitheis, as believed by many, is preserved in the royal chronicle known as '*Cheitharol Kumbaba*'. According to this chronicle, the Manipuris are the descendents of four tribes, viz. Kamal, Luang, Moirang and Meithei, inhabiting the valley in the distance past. In due course, the Meitheis absorbed the rest of the three remaining and divided themselves into seven families (Dunn 1886). These were[8] (1) Kumal, (2) Luwang, (3) Moirang, (4) Ningthouja, (5) Angom, (6) Mangang and (7) Kasagualba.

It appears that one of the seven, Ningthanja, was also known as Meithei clan who fought with the equally powerful Moirang clan and in due course gained the upper hand in the entire process of accumulation of power (Saha 2004:207), subduing the other clans. The Meitheis had their origin in Kangla in the midst of a fertile plain, and that gave them an added advantage.

Adoption of Hinduism by the Meitheis and other people in the valley was in pursuance of the general principle 'Follow the King'. The Manipur king, Gharib Newaz (1709–1748), embraced Hinduism and declared it a state religion in 1714, a fact that opened the floodgate of conversion in the valley, and within years all the Meitheis adopted Hinduism. The conversion of Gharib Newaz to Hinduism has to be seen in the light of conversion to Hinduism of other neighbouring kings like the Ahoms of Assam, Koches of Cooch Behar and the Manikyas of Tripura; all these princes may have inspired Gharib Newaz to turn to Hinduism and claim equality with them.

[8] R. K. Saha (2004) mentions seven Meitei clans, which are a little at variance with those of Dunn. The clans mentioned by Saha are (1) Ningthouja, (2) Angom, (3) Luwang, (4) Kuman, (5) Moirang, (6) Khaba-Nganba and (7) Chenglei.

Writing in 1886, Dunn divided the Meithei families into castes as he perceived. According to him the castes that existed then, perhaps within the fold of the Meitheis, included Brahmans, Ganak (astrologers), Kshatriya, called Khetree, Dholoi, Kayasthas and Mehter or Hari. These were the Hindu castes. 'Mayangs' was the term used for the descendents of the original Hindu migrants, but the word was frequently applied to Muslims. These castes still exist in the Meithei society, but they are not given prominence, and a separate category of social hierarchy has emerged depending on the past history and control of resources by a group. Thus, Saha (2004:201) recognises six ethnic[9] groups in the valley of Manipur. These are (1) Meitheis, (2) Loi/Chakpa, (3) Yaithibi, (4) Bishnupriya, (5) Bamon (Brahman) and (6) Pangon (Muslims).

The Meitheis, generally known as Manipuris, are by far the most vibrant and progressive community. They are all Hindus, having adopted the faith in the mid-eighteenth century and follow a Vaishnavite tradition. Among the Meitheis, the traditional educated elites from rich families with a high status in the society have formed a group of their own going by the name *Gouriya*, and another group not so privileged, called *Sanamati*, has also appeared. All the Meitheis, regardless of their group affiliation, worship Lord Krishna, the Hindu god, locally recognised in Manipur as Shree Govindajee. There are several temples of Govindajee in Manipur, but the one built in 1847 inside the new palace is by far the most important. There is another temple of Radha Raman (another name of Lord Krishna), which is at Canchipur built in the year 1917. These temples are the sites of congregation of Meitheis on important occasions such as Krsna-Jansna. Though majority of the festivals of the Meitheis are based on traditional rituals of Vaishnavism, there are still some festivals as remnants of early Manipur culture. The 'Lai Haraoba' is one of such festival. The Meitheis speak Manipuri, a language of Tibeto-Burman family, and use a script that is similar to Bengali.

During the princely rule, the subjects were divided into three classes: (1) Phamnaiba, (2) Lallup and (3) Loipot. These three classes represented the aristocrats, the commoners and the vanquished (applicable to the hill tribes). While the Phamnaibas, the aristocrats and the nobles were exempted from any labour and assisted the king in day-to-day administration and military affairs, the Lallups were the commoners who were required to provide free labour to the state. In fact, *lallup* was a system of compulsory labour under which all able-bodied person had to work for the state for 25 % of the days. This was an indirect tax on the land that the family cultivated. This system of forced labour was later abolished. Loipots, the lowest group of subjects in the hierarchy, were the people who were conquered and defeated. They lived in the outer zone of the state.

Saha (2004) speaks of three categories of services under the relationship of the king with the subjects and calls them Phamnaiba, Lalupkaba and Loipotkaba, which were rendered by people living in three different zones, viz. A, B and C – A for aristocrats, B for common people rendering *lalup* services and C for Loi/Chakpa and the Yaitheis (Yaithibis) who were considered most degraded.

[9] Ethnic group here includes both castes and tribes.

Thus, a hierarchy in society was created not only in terms of services rendered to the state but also their settlements closer or farther away in relation to the royal seat. The aristocrats lived in zone 'A', commoners in zone 'B' and Lois and Yaitheis in zone 'C'. Traditionally, the villages of the valley had a multi-ethnic and multicultural fabric. With the arrival of Hinduism, a well-differentiated hierarchy developed and the villages turned mono-ethnic like Meithei villages or Loi or Pagom villages housing only one group of Meithei. These villages in different zones have variable soil fertility and productivity, the highest in zone 'A' occupied by the aristocrats, medium in zone 'B' occupied by commoners and those considered lowest in the social order in zone 'C', the zone with the lowest productivity.

The zonation of caste settlements has also produced a zonation of occupation. While farming and public service are the occupations of Meitheis in zone 'A', the common Meitheis and Muslims in zone 'B' have a variety of occupations like fishing, carpentry and pottery. Most ethnic groups like Meithei, Bishnupriya and Pangan in zone 'B' have separate villages. There are no exclusive villages of Brahmans. The low status of each of these villages, regardless of ethnicity of the people, is revealed by prefixing the word *Hanjaba* to the village name. The Bishnupriya village heads *Borpatras* prefix the name of their original residence to their names. In zone 'C', the villages of Yaithibi and Lois have made the best use of land resources, carrying out agriculture in the valley and pineapple cultivation on the hill slopes. The Lois of different villages practise pig rearing, poultry farming, sericulture and pottery, and they even distil liquor.

Thus, the hierarchical order that developed in Meithei society during the rule of Hindu kings who had adopted Vaishnavism is virtually frozen in time partly because of the specific location of each group but more because of the higher status groups persisting to retain their distinctiveness. Modern education has, nevertheless, brought many changes. Women, traditionally assigned a very inferior status in the society, have something to cheer about. There is certainly an appreciation of the value of their work, and they claim certain measure of equality with men. Being a Meithei, specifically 'Phamnaiba', is no guarantee of exemption from tax nor is the erstwhile 'nobility' entertained for preferential treatment by the state. The most striking feature of the change is the revolt of the periphery. The tribes called 'Yaithibi', in historic times, having adopted Christianity, seek their own homeland as a prerequisite to retain their ethnic and cultural identity.

Despite the wave of modernity and democracy, the caste system still exists in the valley in one form or the other. The indigenous people include:

1. Meithei
2. Loi/Chakpa
3. Yaithibi

The people of external origin are:

1. Bamon (Brahman)
2. Bishnupriya
3. Pangan (Muslim)

As discussed above, a most privileged community, the Meitheis are the Vaishnavites with an intra-ethnic hierarchy, depending on their elitist status.

11.6.2.2 Lois/Chapkas

These are descendents of the former inhabitants of Moirang but subdued and subjugated by the Meitheis. They were exiled to the periphery and not allowed to adopt Vaishnavism. Driven out of the main fold and considered of low social respectability, they adopted a variety of professions, besides agriculture. These are Hindus and compare with the scheduled castes of Manipur, in status.

11.6.2.3 Yaithibis

These are the hilly people. Their status was perceived as very low in the social hierarchy.

11.6.2.4 Bamons

The Bamons are scattered and found in most villages and are assigned priestly duties. There are no separate Bamon villages.

11.6.2.5 Bishnupriyas

This is the most controversial group. They are believably the descendents of 120 families of different castes brought into the valley by Gharib Newaz, the king, in the latter half of the eighteenth century, to teach the indigenous inhabitants of the valley the customs of the Hindus (Allen 1905). They intermarried with the people of the country. With the lapse of time, the Meitheis, the original Manipuris, came to the conclusion that the newcomers were of inferior stock and began treating them with contempt. The Bishnupriyas speak 'Bishnupriya', an Indo-Aryan language, and, despite the contempt of Meitheis, consider themselves custodians of Hindu religion. They have also adopted 'Singh' as surnames like their counterparts among the Meitheis. The population of Bishnupriyas has declined as many of them speak Manipuri and have joined the Meithei fold.

11.6.2.6 Pangan

The Muslims are called 'Pangans' by the local population in the valley of Manipur. According to some, the Muslims in Manipur valley are the descendents of the captured Muslims during the war and were allowed by the Meithei King to settle in the valley.

But some others think that these are the descendents of Bengali immigrants, a view more logical than the former. Manipur is contiguous to Cachar, a transitional zone between Bengal dominated by Muslim population and Manipur, and immigration of Muslim artisans appears most likely. Traditionally the Muslims were employed as sepoys but also worked as gardeners, carpenters and fishermen.

11.6.2.7 Social and Political Groups

The social groups are a reflection of traditional hierarchical system among the Hindus. The higher status Meitheis have formed a group called 'Gouriya'. The second rank Meitheis, not to be left behind, formed their own association named 'Sanamahi'. The Lois have their own association, the 'Chapka Association'. Besides these, the people who are not indigenous to Manipur are called 'Mayang' (outsiders), a term originally used for 'Cacharis', the people of Cachar, but now includes all the so-called outsiders, Punjabis, Marwaris and others of non-Manipur origin.

Lately, a number of ethnic political and insurgent groups have emerged in Manipur, the chief being the 'People's Revolutionary Party of Kangleipak' (PREPAK). Besides, there are smaller groups like 'Kuki National Party' or 'Zomi Revolutionary Army', each wanting to have a separate homeland. The people of Manipur, being the inheritors of a well-administered princely state with well-defined borders, are apprehensive of the vivisection of their state on the basis of ethnicity, in the name of ethnic integration, demand made not only by the Nagas of Nagaland but even by the Nagas of Manipur. Similar demand is made by the Kukis. While several ethnic groups demand an exclusive autonomous territory, the larger insurgent groups pretend to stand for an independent Manipur. Thus, a tangled political situation, beset with violence and extortion by the volunteers of these organisations, has emerged. To reconcile the differences and resolve the interstate, interethnic and even antistate conflict is a challenging task facing the country.

11.6.2.8 Changes in the Society

The most visible change seen in Manipur during the last one century is a change in its religious composition. The following statement compares the religious composition of Manipur population as seen in the early twentieth century with the one in 2001 (Table 11.9).

Apparently, the change in the religious composition appears innocuous, but the spread of Christianity among the hill tribes is an additional unifying factor, besides the ethnic identity. Thus, to the Nagas of Manipur who emotionally identify themselves with the Nagas of Nagaland, Christianity is an additional binding force that brings them together, a fact that expresses itself in the demand for the merger of Naga territory of Manipur in Nagaland to create a larger Nagaland. The greater Nagaland problem has become a perpetual source of tension in the region. Other changes include improvement in education, health system and democratic governance that ensures equality to all citizens.

Table 11.9 Religious composition of Manipur population

	1901		2001	
Religion	Number	Percent	Number	Percent
Hindus	170,577	59.36	996,894	46.0
Muslims	10,383	3.65	190,939	8.8
Christians	45	0.02	737,578	34.04
Buddhists	145	0.05	1,926	0.08
Animists	103,307	36.3		
Sikhs			1,653	0.07
Jains	8	0.003	1,461	0.06
Others			235,280	10.85
Religion not stated			1,057	0.04
Total	284,465	99.98	2,166,788	100.04

Sources:
1. Census of India 1901, Vol. IV, Assam pt. II, table V, Shillong 1902
2. Census of India 2001, Religious communities, Statements 2a, 2b, 2c, 2d, 2e, 2f and 2g, pp. XXXI–XXXVII

11.7 The People of Mizoram

The State of Mizoram is predominantly inhabited by Mizos, the tribe after which the state is named, besides 13 other smaller tribal communities.[10] In addition, there is a noticeable presence of immigrant population of Bengalis, Nepalis, Santhalis and others who are not indigenous but employed for a specific tenure. Of the 14 tribal communities, half are indigenous to Mizoram, while the remaining like the Khasis, Nagas and Mikirs are migrants from the neighbouring states with a nominal presence running into a few hundreds. There are no recent data about the number of each tribal community: what is available, however, is the strength of each linguistic group, which corresponds fairly with the actual number of people in each community, as each tribal community has its own language.

The tribal communities, as identified by the Census of India, are enumerated in Table 11.10.

11.7.1 The Mizos/Lushai

Though Mizo is a generic name for any tribe in Mizoram, but strictly speaking, the term 'Mizo' is intended to substitute 'Lushai' that was the actual name of the tribe, later changed to Mizo in 1954 (Change Name Act 1954). Earlier, Mizoram was known as Lushai Hills district, a district in the state of Assam, named after Lushai tribe,

[10]The 14 Scheduled Tribes are (listed alphabetically) (1) Chakma, (2) Dimasa (Kachari), (3) Garo. (4) Hajong, (5) Hmar, (6) Khasi, (7) Kuki (with 37 subtribes), (8) Lakher, (9) Man (Tai speaking), (10) Mizo (Lushai), (11) Mikir, (12) Naga, (13) Pawi and (14) Synteng.

Table 11.10 Tribal and nontribal communities in Mizoram (2001)

	Tribes			Nontribes	
(A) Indigenous group	Number	% of state's population	(B) Immigrant group	Number	% of state's population
1. Lushai/Mizo	646,117	72.70	9. Bengali	13,325	1.50
2. Chakmas	71,283	8.02	10. Nepali	8,944	1.00
3. Pawi	42,230	4.75	11. Hindi	7,702	0.86
4. Lakher	36,018	4.05	12. Santhali	4,654	0.52
5. Kuki tribes	21,040	2.36	13. Bhotia	3,251	0.37
6. Hmar	18,155	2.04	14. Manipuri	1,824	0.20
7. Naga tribes	1,194	0.13	15. Others	9,566	1.07
8. Other tribes	3,273	0.37			
Total of all Scheduled Tribes	839,310	94.42	Total immigrant group	49,266	5.54

Sources:
1. Census of India 2001, A-11, State Primary Census Abstract for Individual Scheduled Tribes (for Mizoram)
2. Nontribal group reconstructed on the basis of the languages spoken as mother tongue. Census of India 2001, Languages p. 45

which translated into English, meant 'headhunter'. Mizo is a more respectable term that means 'highlanders'. According to Grierson (1903) 'all the Kuki-Chin tribes appear to have lived in a nomadic state for some centuries. It would seem that they settled in the Lushai and Chin Hills during the last two centuries. It is here that the chief characteristics of their language developed'. This would mean late seventeenth century. Quoting different authors, Pachuau (1991) believes that the Mizos came from Chin Hills probably in the sixteenth century. In any case, even in a liberal assessment, the arrival of Mizos in their present habitat could not be dated to any time before the sixteenth century. They first entered the Chindwin belt, moved south and southwest, entered Mizoram in the sixteenth century and finally established themselves in a village 'Selrich', close to present Aizawl (Singh 1994). Though Mizos have several subtribes, the Government of India list in 1971 mentions each subtribe like Pawi and Ralte as distinct tribes. In this text, the term Mizo is meant to imply a single tribe.

The Mizos are distributed all over Mizoram, except extreme northern part of Aizawl and southern region of Chhuntuiphui (Fig. 11.5). They speak Duhlian Twang, a language of Tibeto-Burman family and write in Roman script. In common parlance, this is known as Lushai/Mizo. The Mizos are long-headed and have a medium nose and a short and broad facial profile. For long, the community organisation was centred around the village/clan chief, called '*Lal*', who used to guide the affairs of the village community with the help of a council of elders, '*La upa*'. The village chiefship has since been abolished, and a village council manages the affairs of the village and the community. The village chiefs still remain important in traditional sociocultural matters.

The Mizos practise endogamy at community level and exogamy at the clan level. Traditionally, the youngest son used to succeed the father to inherit his property and his position. One has to take note of the fact that the Mizos of today are free citizens and work under a democratic set-up, far removed from the days of early

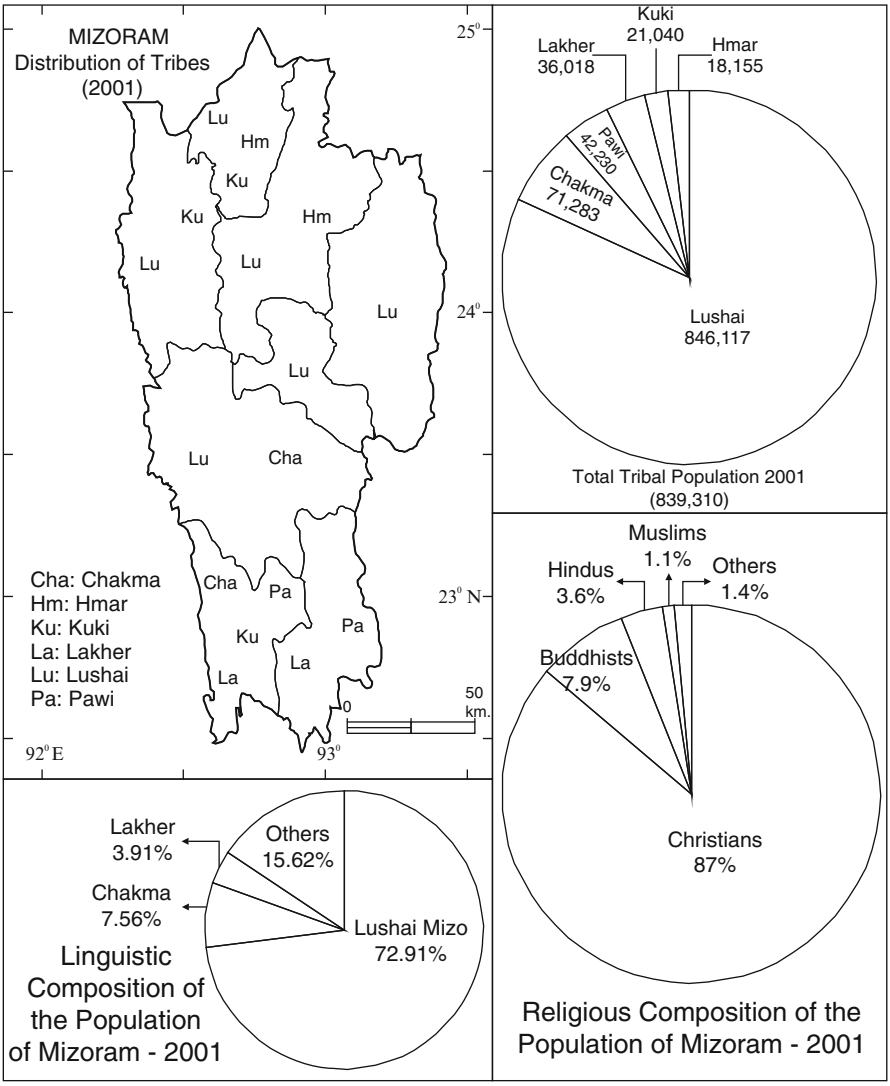

Fig. 11.5 District-wise distribution of different scheduled tribes of Mizoram: their linguistic and religious composition (as per the Census of India-2001)

twentieth century when most of them were animist, ruled by the village chiefs and always at war with the neighbouring village. This often resulted in offensive raids or a battle for defence, when attacked by some other village chief and his associates. The most important change during the last 100 years is the adoption of Christianity as a faith by almost the entire Mizo population. Proselytisation of the tribal population of Mizoram (formerly Lushai Hills) was achieved by persistent efforts of the Welsh Presbyterian Mission that was established in Lushai Hills in 1897. From the status of

Table 11.11 Population and percentage of different religious communities

Religion	1901	1971	1981	1991	2001
Population	82,434	332,390	493,757	689,756	888,573
Hindus	3,373 (4.0 %)	21,229 (6.38 %)	35,245 (7.13 %)	34,788 (5.04 %)	31,562 (3.55 %)
Muslims	202 (0.24 %)	1,882 (0.56 %)	2,205 (0.44 %)	4,538 (0.65 %)	10,095 (1.13 %)
Christians	45 (0.05 %)	286,141 (86.08 %)	413,840 (83.81 %)	591,342 (85.7 %)	772,113 (87.02 %)
Sikhs	25	427	421	229	326
Buddhists	132	22,647 (6.81 %)	40,429 (8.18 %)	54,054 (7.83 %)	70,494 (7.93 %)
Jains	–	–	11	4	17
Animists 1901/others 1971–2001	78,657 (95.17 %)	62	1,606	1,859	2,443 (0.27 %)
Religion not stated	–	–	–	–	661

Sources:
1. For the religious composition for 1971–2001 refer to Religious Composition Census of India 2001, pp. XXX–XXXVII.
2. For religious composition of Mizoram (Lushai Hills) Population for 1901, see Allen (1901)
During the Census of 1971–2001, there are no animists, but those not included in the above religious groups have been referred to as 'Others'
The figures in brackets are the percentage of the population following a specific religion

being called animist in 1901, almost the entire Mizo population consists of devout Christians. Today Christianity is the hallmark of Mizo social life. This is witnessed in 'hunserh, a brief dedication service where some verses of bible are read, followed by a prayer', before the start of any community activity (Lal Pudaite 2005).

11.7.1.1 Transformation of the Religious Character of Mizoram: A Century of Change

Table 11.11 gives a picture of how the number and the ratio of Christian and Buddhist population in the state have increased.

Till the beginning of the twentieth century, much of the population of Lushai Hills did not follow a formal religion though they had their own belief system and believed in some super power. The Lushais, classified as 'animists', accounted for more than 95 % of the population of Lushai Hills district,[11] a district in erstwhile Assam province of British India. Today, over 87 % of Mizoram's population is Christian, though if one considers only Mizos, the number may be almost 100 %.

[11] The Lushai Hills district subsequently became a state under the name 'Mizoram'. The areas were identical.

The 13 % non-Christian population of Mizoram includes about 8 % Chakmas who are Buddhists, over 3.5 % Hindus and 1 % Muslims. The entire indigenous population of the state has adopted Christianity.

The impact of Christianity has been conducive to the community, as reflected in a high percentage of literacy. For a community always at war, the Mizos have turned into what Kyndiah calls a 'close-knit society, classless and casteless, absolutely democratic in character' (Kyndiah 1994). The Mizos are good traders and talented artisans, particularly good at textiles. The entire code of conduct of the community is enshrined in a value system '*Tlawmngaihna*' that is the ultimate in Mizo ethical value system and is emphasised by all those who are a part of the Mizo society.

A candid and well-understood view of Mizo society is expressed by Lalkhama (2006) in his autobiography, a very readable text. The following passage of his book sums the character of Mizo society through his elaboration of the spirit of '*Tlawmngaihna*'.

> Tlawmngaihna connotes and implies uprightness, courage and self sacrifice. It implies courtesy, humility and modesty. Its essence is consideration for what is good and pleasing for others and for the society, respect for parents and older people and ready help for the needy. It is the fine art of doing any duty in relation to others as if naturally without apparent effort and stiff formality or impertinent forwardness. (Lalkhama 2006:343)

But despite the traditional ethos of 'Tlawmngaihna', the Mizo society had an inglorious history. It practised slavery known locally as '*Bawi*' system (Carey and Tuck 1896, reprinted 1983). There were several categories of slavery that included prisoners captured in raids, criminals condemned to slavery and those who were born in slavery. Besides, there was another class formed by people who willingly submitted to be slaves because of poverty. It seems 'a man had the same right to kill or sell his slave as his dog and a chief used his slaves as concubines, if he so wishes…. The slaves were distributed among the successors like 'beads' and guns. With time, the slavery lapsed. Bawi system died a natural death, with the lapse of time, without being formally abolished by law and without ransom paid to the chief' (Lalkhama 2006).

Mizos have many festivals. Besides Christmas, the principal fête of Christianity, and Easter, the Mizos celebrate three traditional festivals, each connected to some agricultural event or the other. *Chapcharkul* is celebrated in March as it coincides with the slashing of the jungle for jhum. *Mim Kut* is celebrated after getting the first harvest of maize and vegetables, and *Pawl Kut*, the last traditional festival of the year, is celebrated in December to mark the harvest of paddy from jhum. Like the *morung* of Nagas, the Mizos have '*Zawlbuk*', the bachelors' dormitory, but this institution has a competitor in Young Mizo Association and may fade into insignificance.

The economic life of Mizos still resolves around *jhum*, the shifting cultivation, as it has been for centuries. There is, however, little doubt that sociocultural regeneration of the society, shedding its age-old insidious ways and adopting a democratic sociopolitical organisation, will lead to an economic resurgence. The change in the land use pattern, adoption of an appropriate cropping pattern and scientific methods will certainly higher agricultural productivity.

11.7.2 Non-Mizo Communities of Mizoram

Among the remaining communities of Mizoram, *Chakmas* are the most significant, firstly because of their numerical strength – 7.5 % of the state's population – but equally because of their being an immigrant group that migrated to Mizoram during the last 50 or 60 years from neighbouring Chittagong Hills of Bangladesh. They are Buddhists and speak a language allied to Bengali, an Indo-Aryan language, distinct from most of the Tibeto-Burman family of languages spoken in the hilly border states. Initially, the Chakmas were largely confined to Chittagong Hills district of Bengal which became part of East Pakistan, now Bangladesh, following the partition of the country. There has been a steady, yet persistent migration of Chakmas to the neighbouring states of Mizoram and Tripura. In Mizoram they are concentrated in the southwestern region, adjoining Chittagong tract of Bangladesh, in Karnafuli basin, spreading over the two districts of Lunglei and Chhimtuipui. They migrated to Mizoram territory, after the partition, as a result of huge pressure exerted by the influx of population from other parts of East Bengal. Thus, while there were virtually no Chakmas in Lushai Hills district in 1941, their number reached beyond 15,000 in 1951, and by 1971 there was such an influx of Chakma population in Mizoram that the Government of India had to set up a Chakma Autonomous District Council in the state.

The population of people speaking Chakma as their mother tongue was 67,057 in 2001 Census. The building of Kaptai Hydroelectric Project in the erstwhile East Pakistan, which inundated large areas of cultivated land, forced thousands of Chakmas to take shelter, elsewhere. They migrated to Tripura and Mizoram and some were settled even in far away Arunachal Pradesh. The Chakmas, following the Theravada school of Buddhism, also worship many of the Hindu gods and goddesses. The Chakmas have brought with them the technique of plough cultivation in Mizoram. Basketry, weaving and fishing and woodcarving remain their supplementary source of income.

11.7.2.1 The Lakhers

A Mizo tribal group but different from Lushai, the Lakhers are settled in Chhimtuipui district. Unlike the Chakmas, they are an indigenous group and found only in Mizoram. Like the Mizos, they follow shifting cultivation and maintain an independent tribal identity. They form about 3.5 % of the population of the state.

11.7.2.2 Paites

Paites, another tribal group, are found in Mizoram in relatively small number, though the focal area of their concentration is in Churachandpur district of Manipur.

It is also believed that Paite and Pawi are of the same origin and came from Kubo valley in the seventeenth century (Singh 1994:959). The group that remained behind in Mizoram is known as Pawis.

11.7.2.3 The Pawis

Like the Lakhers, the Pawis also occupy a niche in the southwestern district of Chhimtuipui and form over 2 % of the population of the state. Some are in the mid-eastern region of Champhai. Though their mother tongue is 'Lai Hawlh', it is usually recognised as 'Pawi'. Primogeniture is the usual style of succession. Like the Mizos, all Pawis are Christians, practise shifting cultivation and grow paddy, maize, ginger and vegetables.

11.7.2.4 The Raltes

The Raltes represent a small group. The word literally means 'enemy'. For some peculiar reason, other tribal groups like Lushai, Pawi and Hmar call them Ralte. The Raltes are largely concentrated in Aizawl district, but they are also seen in southern part of the state. They speak, like the Lushais, Duhlian and use Roman script. Believably, there is a culture of milk among the Raltes and they feed their children on milk. Like other tribal groups, they smoke indigenous cigar and chew betel leaf and areca nut. The youngest child in the family inherits the property of the father, though the authority of elder sons is respected.

11.7.2.5 The Reangs

The Reangs are listed as one of the scheduled subtribes under the banner of Kukis. Yet, one is not certain of their origin. They are not indigenous to Mizoram and their main concentration is in Tripura, where they are believed to have migrated from Chittagong Hill tract in the mid-fifteenth century. Did they have a second stage migration to Mizoram is an open question. The fact today is that the Reangs are a large linguistic group in Mizoram, with a strength of around 17,000 people (16,909 persons in 2001). Not being Mizos, the Reangs are not welcome in the state. There have been clashes between the two communities and a large number of Reangs are forced to leave Mizoram and move into neighbouring Tripura where some 34,000 Reangs were till lately living in camps, waiting to be rehabilitated (Saha 2005). It is quite possible that during the last decade, between 2001 and 2010, the Mizos have been able to push a majority of Reangs out of their state. Reangs are Hindus and worship Hindu gods and goddesses. According to Mizo authorities the Reangs, whom they call '*Brus*', fled from Mizoram to Tripura in 1998 (Pudaite 2005). It is difficult to ascertain the fact but the case for resettlement of Reangs cannot be overstated.

11.7.2.6 The Hmars

Mentioned as an independent tribe in Mizoram and different from Lushai tribe, Hmars have their largest concentration in Manipur. But like Kukis they are a part of the Kuki-Chin tribal group who were pushed towards north, leaving a residual population of over 16,000 Hmars in Mizoram, largely around Aizawl. The Hmars, counted as an independent tribe, have their largest concentration in Manipur, especially Churachandpur district, North Cachar Hills and Cachar districts of Assam and Aizawl district of Mizoram and Tripura, thus occupying, though not exclusively, a block of contiguous territory that straddles over several states. Their population is close to 100,000. They have several clans, but majority of the Hmars, like the Mizos in Mizoram, have adopted Christianity. Though being at peace with the Mizos, the Hmars zealously guard their identity and have organised themselves into Hmar National Union.

Besides the Lushais and associated tribal groups, there is a floating population of over 30,000 Bengali-, Hindi- and Nepali-speaking people in the state. These are wage earners who migrate periodically from Cachar region of Assam or Central Government employees in different government departments, educational institutions or attached to private entrepreneurs. One also finds a lot of Hindi-speaking people on construction sites. The Nepalis have either petty shops, run taxis or engage in dairying. But, these non-Mizo people don't add up to even 0.5 % of permanently settled Mizo population.

11.7.3 An Overall View of the Peripheral Tribal Region

The three peripheral states of Nagaland, Manipur and Mizoram, having international border with Myanmar, are inhabited by hill tribes, which were for long animists but have adopted Christianity during the last 150 years. Despite the pretension of a regional tribe-specific culture, these tribal communities are unrecognisably transformed in their belief systems, lifestyles and cultural practices. The old rituals are fading away and some of the abhorrent practices, like headhunting, have completely disappeared.

These hill people are tribes only in name and exist on the pages of the Indian Constitution that offer them protection against encroachment and dispossession of the land and other resources and ensure certain privileges to overcome the disadvantages they have inherited as a result of their isolation. Today, having attained a reasonable level of educational achievements, the hilly tribes in the hilly border states can compete with the best anywhere in India. Their political awareness can be judged by the fact that they have been fighting for freedom and could be reconciled to their existence as constituents unit of Indian Republic with great difficulty.

Each of these five states – Arunachal Pradesh, Nagaland, Manipur, Mizoram and Meghalaya, where there is a predominance of tribal population – has a central university and a number of technical colleges and schools. With a high level of

Table 11.12 Population of Tripura (2001)

	Population	Percentage of total population
Total population	3,199,203	100.00
(a) Scheduled tribe population	993,426	31.05
(b) Nontribal population	2,205,777	68.94
(i) Scheduled castes	555,724	17.37
(ii) Nonscheduled castes	1,650,053	51.57

Source: Census of India 2001, Final Population Totals, p. 81

literacy comparing favourably with most states of India and a sex ratio much above the national average, these peripheral states are likely to emerge as the most progressive region of India.

11.7.3.1 Transition from the Tribal to the Most Progressive State

With a landscape – mountains, forests, a cool salubrious climate – the peripheral tribal region of North-East India does not have the enervating climate of the Tropics. A density of population hovering in the neighbourhood of 100 persons/km^2 and potential silvi- and horticultural resources, the region could become the fruit basket of India and a dairy region.

Located in the transitional zone between South Asia and Southeast Asia, it shares the advantages of both and could, in the long run, prove a bridge between the economy and culture of the two regions.

11.8 The People of Tripura

The people of Tripura are represented by three distinct ethnic stocks: The Indo-Aryan, the Mongoloid and the Mundari. The last group of people is represented by a small population of Munda tribe that was brought to Tripura to work on tea plantation. Principally, it is the remaining two stocks, i.e. Indo-Aryan and the Mongoloid, who constitute almost the entire population of Tripura. The Indo-Aryan group is represented by the immigrant population consisting largely of different castes of Hindus and the Muslims. The Mongoloid group consists of the indigenous tribal communities.

The population of Tripura is thus divided into two principal groups:

1. The tribal (Scheduled Tribes) population
2. The nontribal population

The population between these groups is divided as follows (Table 11.12):

The original inhabitants of Tripura are undoubtedly the Tripuras after whom the princely state is known as Tripura. The British called it Hill Tipperah. The state

Table 11.13 Major tribes of Tripura state and their population (2001)

Tribes	Population in 2001	Share of a specific tribe in the total tribal population in percent	Areas of concentration
1. Tripuras	543,848	54.74	Scattered all over with maximum concentration in West Tripura
2. Reangs	165,103	16.60	South Tripura and Dhalai
3. Jamatias	74,949	7.54	South Tripura
4. Chakmas	64,293	6.47	North Tripura, Dhalai
5. Halam	47,245	4.75	W. Tripura, Dhalai and N. Tripura
6. Mogh (Mag)	30,385	3.05	South Tripura
7. Mundas and Santals	14,575	1.46	West and North Tripura
8. Garos	11,180	1.12	South Tripura, Dhalai
9. Noatias	6,650	0.67	West Tripura
10. Orang	6,223	0.62	North Tripura
11. Others	28,997	2.90	
Total	993,426	99.92	

Source: Census 2001, A 11 State Primary Census Abstract for individual Scheduled Tribe 2001 Tripura

lying on the border of Bengal has always experienced immigration, but during the last 4–5 decades, immigration has assumed an unprecedented scale, resulting in the change of the demographic composition.

The major tribes of Tripura, their population in the state and the areas of their concentration are given in Table 11.13. Some of these tribes are not native of Tripura. While there are immigrant tribes like Garos and Lushais from the neighbouring states of Meghalaya and Mizoram, there are others who are transported from Chota Nagpur Plateau like the Mundas and Santals.

As is natural, the Tripuras, the community indigenous to the state, command more than half the tribal population of the state, followed by Reangs, Jamatias, Chakmas and Halams. Unlike other hilly states like Nagaland and Mizoram where a specific area is almost exclusively occupied by a tribe, Tripura presents a better picture where most of the tribes are distributed all over the state with some preferred area of concentration. Thus, Tripuras though widely distributed show a greater concentration in West Tripura. Similarly, the Reangs are distributed in the southern part of the state occupying South Tripura and the mid-eastern district of Dhalai. Small tribal groups like the Noates are largely settled in West Tripura area. In contrast, the Reangs, the second largest tribal group, have virtually kept away from the more urbanised western Tripura. So also is the case of Jamatias who have preferred South Tripura district. It is not that the tribal communities which are not so frequent in West Tripura have kept away by choice, but more likely is the fact that they have been crowded out by Natun Tripuras, who have formed a ring around Agartala as if to protect the royalty.

11.8.1 The Components of Tribal Population

There are nineteen tribes[12] listed in the Constitution of India as amended in 1976 that are found in Tripura (Fig. 11.6). Not all are equally important and half a dozen tribes account for 98 % of the total tribal population in the state. The most important tribes, among the listed ones, are Tripuras, Reangs, Jamatias, Chakmas, Halams, Noatias and Moghs. Together, these tribes don't add up to even a million. The tribal population of 993,426 includes all the tribes including the less known ones.

11.8.2 The Principal Tribes of Tripura

11.8.2.1 Tripuras

Also known as Tripur or Tripuris, this group represents more than 50 % of the total tribal population of the state. Socially, the Tripuras divide themselves into two groups: the age-old Tripuras, called locally as '*Puran Tripuras*' – *puran* in vernacular means old – and the new Tripuras, known as '*Natun Tripuras*'. The Puran Tripuras are the original inhabitants of the state and represent a clan from which the rulers of Tripura derive their descent. The ruling section of this group is known as '*Thakur people*'. 'The 'Natun Tripuras' came into existence at a later period as a result of marital contacts between the Puran Tripuras and a caste section of the Bengalee settlers' (Menon 1975:143). There is a wide social distinction between the two groups, as the Natun Tripuras unlike the Puran ones have been greatly influenced by the language, customs, culture and tradition of Bengalis.

As a tribal group, Tripuras present a clear stratification. The socially advanced section of the community has moved closer to Agartala, forming a ring around the capital. This group competes with the immigrant Bengali population in their educational and cultural attainments, and its members hold important positions in the field of education and other public services and economic enterprise and actively participate in the programmes of the state's socio-economic development. The other residual group that is left behind still lives in the southeastern hilly region of the state, practising shifting cultivation and rearing pigs and fowls. They specialise in traditional crafts and bamboo works and have not yet risen above subsistence level of existence.

Speaking their language '*Tripuri*', which has adopted Bengali script, most of the members of this tribe can speak and understand Bengali and are, for all practical purposes, bilingual.

[12] The tribes of Tripura, as listed in the Constitution of India, are (in alphabetic order) (1) Bhil; (2) Bhutia; (3) Chaimal; (4) Chakma; (5) Garo; (6) Halam; (7) Jamatia; (8) Khasia; (9) Kuki (with 17 subdivisions); (10) Lepcha; (11) Lushai; (12) Mogh (Mag); (13) Munda; (14) Noatia; (15) Orang; (16) Reang; (17) Santal; (18) Tripura, Tripuri and Tipperah; and (19) Uchai.

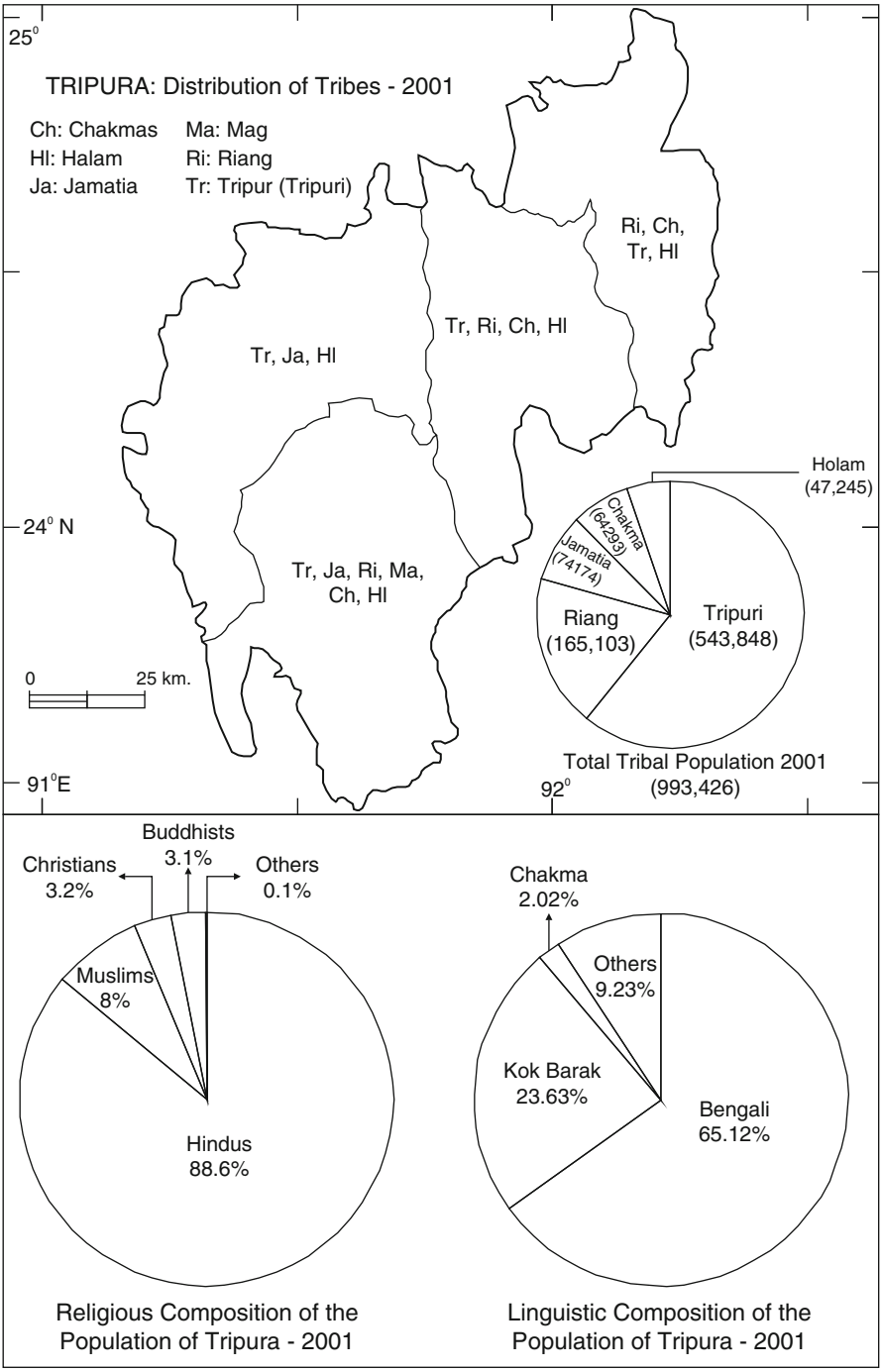

Fig. 11.6 District-wise distribution of different scheduled tribes of Tripura: their linguistic and religious composition (as per the Census of India-2001)

The Tripuras, as a group, are not always at peace with the state or with the immigrant population. Even other tribal groups, especially Reangs, have often come into conflict with the immigrant population. For all practical purposes, Tripuras are Hindus. They follow Hindu rituals and worship Hindu gods and goddesses.

11.8.2.2 The Reangs

Reangs are the second largest group of tribal population in the state and form around 15 % of the total tribal population. Originally the palanquin bearers of Tripura Maharaja, the community is far behind the Tripuras in their socio-economic achievement. They have a system of internal government and choose their chief. Like many other tribal communities, the Reangs also worship Hindu gods and many have turned to Vaishnavism. A large number of them still practise *jhuming* in the eastern hills, but some have also taken to plough cultivation. As a community, they are disciplined yet pleasure loving and extremely fond of drinking and dancing. Known for their fighting quality, they formed the backbone of the army of Tripura rulers.

11.8.2.3 The Jamatias

A subgroup of Tripuras, Jamatias claim a distinct position in the tribal society because they 'served in the past in the army of Tripura. The word Jamat means a group or a congregation of people. The army, which was formed by them, was called 'Jamat'. Since then, they have been known as Jamatias' (Bhattacharjee 1983:3). Their warlike qualities seem to be well recognised, and W. W. Hunter (1881) qualified Jamatias as a fighting caste and perhaps the second important tribal group, led by Tipperahs and followed by Nowatias and Reangs. The community is Hinduised beyond recognition and follows many customs of Hindu Bengalis. They have migrated to the plains in large number and have taken to farming, living in houses similar to other immigrant population of the plains.

11.8.2.4 The Chakmas

A tribal group following Buddhism, the Chakmas seem to have their origin in Arakan region and migrated to Tripura through Chittagong Hills. Their number in the state swelled, as they entered into the state as refugees from Chittagong region as a result of displacement, following the construction of Kaptai Hydroelectric Project in 1964. But another wave of Chakmas arrived in Tripura after Bangladesh came into existence. The Chakma population had to face persecution at the hands of immigrant Muslim Bengalis who were being settled in Chittagong Hills, the homeland of the Chakmas. The strength of Chakma refugees reached 56,000 in 1992. They were later repatriated to Bangladesh by 1998, following the 'Chakma Peace Accord' signed by Bangladesh in 1997 (Das 2002:80). Chakmas are largely

distributed in South Tripura, notably in Amarpur, Sabroom, Udaipur and Belonia subdivisions. Some of them have also moved to Kailashahar division further north. Though Buddhists by religion, they have incorporated many of the rituals of Vaishnavism in their religious practice.

11.8.2.5 Kukis and Halams

These are associated groups. The section of Kukis that surrendered to the royalty in Tripura came to be known as *Halam*, while those who remained independent and often raided Tripura or some part of British territory carried the usual name '*Kukis*'. It is believed that some Kukis are very old settlers of Tripura, though their number remained relatively small. The Halams have moved away from their original flock of Kukis, speak Tripuri and follow the customs of Tripuras, observing many of the festivals of the Hindus. Other significant indigenous tribes include Noatias and Moghs.

11.8.2.6 Immigrant Tribal Groups

There is a segment of immigrant tribal group, which consists of tribes from the adjoining areas. These include Garos and Khasis from Meghalaya and Lushais from Mizoram state. The Kukis came from the hilly areas of Manipur. In fact, their largest concentration is in southwest Manipur, and they seem to have drifted into Tripura and settled there.

11.8.3 Religious Composition of the Population of Tripura

The most spectacular feature of the religious composition of Tripura's population is the absorption of a large segment of tribal population in the Hindu fold. There have been, no doubt, conversion to Christianity, but the majority has turned to Hinduism under the influence of the king of Tripura who was a devout Hindu. The present religious composition of the population of the state does not quite reflect the character of the territory, which was known, until 60 years ago, for its forests, elephants and the simple tribal folk (Table 11.14). The data available of religious composition of the state are not grouped separately for tribal and nontribal population but the entire population as a whole.

11.8.4 Tribal–Nontribal Interaction

Nothing in the demographic composition of Tripura has attracted so much attention as the tribal–nontribal interaction and their changing numerical strength, and there

Table 11.14 The religious composition of the population of Tripura (2001)

Hindus	2,739,310	85.60 %
Muslims	254,442	7.95 %
Christians	102,489	3.20 %
Sikhs	1,182	0.036 %
Buddhists	98,922	3.09 %
Jains	477	0.015 %
Other religions	1,277	0.04 %
Religion not specified	1,104	0.035 %
Total population of the state	3,199,203	99.96 %

Source: Banthia (2001)

Table 11.15 Different categories of population in Tripura in 1951 and 2001

	1951		2001	
Category of population	Population	Percentage of total population	Population	Percentage of total population
1. Scheduled Tribe	192,293	30.09	993,426	31.05
2. Scheduled Caste	46,371	7.26	355,724	11.12
3. Backward class	30,349	4.75		
4. Non-backward class	369,922	57.88	1,850,053	57.82
5. Anglo-Indian	94	0.014		
Total	639,029	99.99	13,199,203	99.99

Sources:
1. Census of India (1951, vol. XII, Assam, Manipur & Tripura, pt. II-A, table D-III, pp. 108–110)
2. Census of India (2001, Series 1 India, Final Population Tables, p. 81)

is a present belief that the tribes of Tripura have been overwhelmed in their own land by an immigrant population.

The population of Scheduled Tribes, Scheduled Castes and others in the population of Tripura in 1951 and 2001 was as follows (Table 11.15):

The change in the relative strength and composition of the tribal and nontribal communities has been a recurring theme discussed by sociologists and anthropologists, and some have even emphasised the dominance and exploitation of tribal communities by the immigrant nontribal population. Here are some viewpoints expressed by social scientists.

'Poverty, starvation and death in Twipra *(Tripura)* are the fall out of unabated process of influx of people from across the international border of erstwhile East Pakistan and now Bangladesh….. Needless to say that the process of immigration, which led to imbalance *(in)* demographic structure has uprooted the Boroks from relatively more developed and urban areas and further pushed them to the hilly, interior and undeveloped areas of the state' (Debbarma 2002:280). Similarly Mukherji and Singh (1982) further observe that 'Both in pre-independence and post independence era, Tripura witnessed regular inflow of immigrants and land alienation of tribals… They had to bear the brunt of massive influx of refugees into

the state'. Or as Bhaumik (1996) says, 'The TNV's (Tripura National Volunteers) anti-Bengali violence created a general climate of ethnic hatred which was sharpened by large-scale alienation of tribal lands and actual marginalisation in jobs, profession and politics'.

These and many other observations suggest and have created an impression that the native population of Tripura is exploited, irreparably harmed and pushed to the periphery, being alienated from their land, dispossessed of their properties and evicted from the sociopolitical space of the state. The immigrants are painted as villains inflicting heavy losses on the original settlers of the state. Today the Scheduled Tribes account for 31.05 % of the total population of the state. The assumption is that the remaining 69 % are immigrants, rank outsiders, who entered Tripura and have usurped the resources of the state. This, however, is not true. Certainly, there has been immigration by people, especially from East Pakistan, now Bangladesh, but the ratio of tribal population has not declined during the last 60 years. In fact, it has marginally increased from 30 % in 1951 to 31 % in 2001.

It is undeniably true that Tripura has witnessed large-scale migration, especially after the partition of India in 1947, when large number of Hindu refugees arrived from East Pakistan to escape persecution from the majority community. While the number of migrants after the partition is well recorded, the immigration before 1946 was never discouraged by the Raja and the people of Tripura. In fact, it was a welcome immigration, a situation in which the initiative of the immigrants in developing the resources of state and the organisation of the services was appreciated.

Another aspect of this proposition, viz. exploitation of the state's resources by the nontribal population, equates nontribal inhabitants with immigrants, as if nontribal people never existed in Tripura and all of them are immigrants. This proposition may appear absurd, unless one assumes that the people of Bengal, the British districts of Noakhali and Sylhet, Chittagong Hills or the British district of Tipperah just west of Hill Tipperah (now Tripura) stopped short of Tripura's western boundary in their colonisation of more and more agricultural land. One has to bear in mind that western one-third of Tripura territory is physiographically an extension of Bangladesh and there was nothing to bar the people of Bengal from moving eastward.

What appears more likely is that the West Tipperah had a sizable presence of nontribal populations, particularly Muslims, for several centuries, and these early settlers and their progeny have been living quite harmoniously with the tribal population of the state and cannot be treated as immigrants.

11.8.5 Difficulty in Determining the Strength of the Tribal Communities over the Decades

There is a serious difficulty in knowing the strength of the tribal community in a population mix for any census period before 1951. The concept of Scheduled Tribes as much as the concept of Scheduled Castes was introduced in the Indian Constitution in 1951. Before that, during the previous censuses, castes and tribes were bundled

Table 11.16 Castes and tribes of Tripura 1891

Caste/tribal population	No. of persons
Baidas	47
Banya	174
Brahmin	4,172
Chakma	4,734
Dhopas	185
Harijan	151
Napit	151
Bhuimali	287
Kaibarta	705
Kanar	674
Kopali	344
Kayastha	1,444
Kukis	3,824
Kanhar	553
Namsudras	145
Rajput	10,877
Sunri	1,625
Tipperah	61,314
Musalmans Sunnis	37,087
Persons returned by title or unknown subcaste	
Hindus	6,027
Sudras	5,974
Population of Tripura (1891)	137,442

Source: O'Donnel (1893)

together. To quote an instance, the 1891 Census of India vol. IV, related to 'The Lower Provinces of Bengal and their Feudatories', mentions the following castes and tribes in Hill Tipperah (Table 11.16).

This medley of castes and tribes, which greatly interested the British authorities and which has since been discontinued after 1931, tells us something about the social composition of population but does not delineate the tribes from the castes. From the contemporary list of Scheduled Tribes, only three appear in 1891. These are Tipperah (present Tripuras), Chakma and Kukis. Together these make a tribal population of 69,872 which is 50.8 % of the total population of Tripura in 1891.

11.8.6 Immigration in the Late Nineteenth Century

The immigration in Tripura is neither confined to post-partition period of the late 1940s or early 1950s of the last century nor is it confined to its provenance in Bangladesh. As early as 1891, over 25 % of the total population of Hill Tipperah, then a feudatory state of the British, was an immigrant population. And the immigrants

were not only from Bengal but arrived from Assam, notably Meghalaya region, Mizoram, Manipur, Nepal and other parts of India. Besides, there was a native nontribal population. Thus, the entire population of Tripura had three distinct groups.

1. Tribes (Tipperahs, Chakmas and Kukis)	69,872	50.80 %
2. Other early settlers not counted as immigrants	34,242	24.91 %
3. Immigrants	33,328	24.25 %
		99.96 %

11.8.6.1 The Event3s of the Last Quarter of the Nineteenth Century That Influenced the Demographic and Social Structure of Tripura

The last quarter of the nineteenth century is by far the most significant period in the history of Tripura, a period during which many movements initiated by the rulers triggered a transformation of the society.

1. *Abolition of slavery* – After the state of Tripura was conquered by the British in 1761, no political agent was appointed till 1871, and the Raja was an absolute monarch, but after the appointment of a British agent in 1871, a number of reforms were introduced, the most significant being the abolition of slavery and the system of *suttee* among the Hindus. Thus, the tradition of slavery ended in 1871 and the *suttee* system was abolished in 1888.
2. *The title of Maharaja to the King of Tripura* – After the appointment of W. B. Power as the British agent of Tripura, the then ruler of the state Bir Chandra Manikya received the title of 'Maharaja' in 1877. This not only enhanced his prestige, but he launched a number of movements, which he considered reforms.
3. *The caste movement* – The caste movement was a movement of far-reaching significance that transformed overnight the religious composition of the state. It was in 1880–1881 that this movement was launched to raise the status of tribal people and among them the Maharaja himself. This led to the adoption of Hinduism by almost the entire tribal population of the state except the 'Kukis'. The population of 'Tripuras' adopted en mass Hinduism that changed completely the religious composition of the state, resulting in the disappearance of 'Animism' as a religion, in the Census of Bengal after 1881.

11.8.7 Immigration: Its Causes, Intensity and Impact

No other part of India has witnesses such a huge immigrant population as Tripura. May be Assam could be another state with a large immigrant population, but not at all comparable to the immigrant stream in Tripura.

There are several reasons which have operated discretely and sometimes in collusion to accelerate the process, depending on the historical situation. What is clear

is that immigration in Tripura is not a recent, post-partition phenomena, but it has been always there, initially as a natural process as a result of population density gradient, then an induced migration encouraged by the Maharaja of the state and finally a pushed migration that followed the persecution of Hindu minority in the neighbouring state of East Pakistan, now Bangladesh.

11.8.7.1 The Natural Migration

When the process of migration from Bengal to Tripura started is difficult to guess, but what gives credence to a phenomenon of early immigration is the absence of any physical or even administrative barrier to such migration.

A very high density of population in the neighbouring districts of Bengal, like Chittagong, Noakhali and Tipperah (a British district just west of Hill Tipperah, the name used by the British authorities till 1921), and a very low density of population in Tripura, ranging from 23 persons/km^2 in 1881 to 93 persons/km^2 in 1941, combined to produce a natural inducement to migrate to an area with no competition for agricultural land, though it required to be reclaimed by hardwork.

The impressive growth of population of Tripura that reached 32.5 % between 1901 and 1911 is largely attributed to the 'influx of immigrants who are more numerous by 37,769 than they were ten years ago, and one third of population consists of persons born outside the state. They include a large number of Mohammadans from the adjoining districts of Tripperah and Sylhet increasing the number by 43.3 %' (O'Malley 1911:117). Despite the continuous stream of arrival of Muslims in Tripura in the early part of the nineteenth century, 'the state remains predominantly Hindu for the reason that though the Moghuls conquered the raja, they obtained no permanent foothold in his domains … and even in the Moghul times his court was a refuge for a number of Hindus from the plains who received grants of land in what is now (was then – parenthesis mine) his estate in Tripura district and exercised great influence on his administration. The flow of migration has in the last half century almost swamped the indigenous population, and the Hindu majority is maintained in spite of the fact that so many migrants have been Bengal Mohammadans from Tippera and from Sylhet in Assam' (Thompson 1923:162).

11.8.7.2 Induced Migration

As seen earlier, this kind of migration resulted from the policy of the Maharaja of Tripura who induced Hindus to migrate in ever larger numbers. This appeared particularly after 1880–1881 when the caste movement was initiated, and almost the entire tribal population of Tripura embraced Hinduism. By giving land grant, offering positions in the service of the state and observing the rituals and festivals of the Hindus, the rulers left no one in doubt that Hinduism was the state religion. This reflected in 'Kharchi puja' at old Agartala at the temple of 'Chaturdasa Devata' worshipped by the *Cantais*, the priests of Tripura. It must be noted that this

Table 11.17 Religious distribution of population per 10,000

	Number per 10,000			
Religions	1881	1891	1901	1911
Hindus	1,022	6,670	6,877	6,885
Musalmans	2,818	2,698	2,615	2,829
Animists	6,148	–	154	18
Others	12	632	354	268
Christians (actual numbers)	113	133	137	138

pantheon of 14 deities were the Hindu gods identified as *Siva*, *Durga*, *Hari* or *Vishnu*, *Ma* or *Sri* or *Lakshmi*, *Vani* or *Sarsvati*, *Kumar* or *Kartikeya*, *Ganapa* or *Ganesa*, *Vidhi* or *Brahma*, *Krishna* or *Prithvi*, *Abhdi* or *Samudra*, *Ganga Sikhi* or *Agni* and *Kamdev* or *Himadri*.[13]

The major change in the religions structure of the state's population occurred between 1881 and 1891, following the caste movement (see Table 11.17).[14] The percentage of animists in the state that was 61.48 % in 1881 dramatically disappeared in 1891, following the enumeration in 1891 when all the tribal population opted for Hinduism as their religion, inflating the strength of the latter from 10 % in 1981 to 68 % in 1891. Before 1891, the Muslim population was higher than that of Hindus, but the initiation of caste policy of the ruler, the Maharaja, inducing Hindus to migrate in numbers, reversed the entire trend.

11.8.7.3 The Post-partition Migration

Unlike the earlier migrations, this was the one that virtually forced on the minority Hindu population of East Bengal to escape persecution, genuine or perceived, at the hands of the majority community. The migration from East Pakistan took several directions. Some of the refugees migrated to West Bengal, some escaped to Assam following the Brahmaputra valley trail and a large number from the neighbouring districts of Noakhali, Chittagong Hills, Sylhet and Mymensingh poured into Tripura. The total number of immigrants in Tripura reached a level of roughly 230,000 in 1961, of which 210,161 were those born in Pakistan. The actual number that migrated to Tripura as displaced person following the partition till 1951 census enumeration was 101,200; obviously the remaining population that crossed as migrants, numbering about 120,000, had migrated to Tripura during the preceding decades.

Immigration is not a new phenomenon in Tripura; it has always added to the population of the state. The figures given in the Table 11.18 are based on the

[13] These names are mentioned in the description of old Agartala in Gazetteer of Tripura (Menon 1975:388)

[14] Census of India (1911).

Table 11.18 The level of immigration as counted at each census

Year	Total population of Tripura state	Immigrant population	% of immigrant population	Variation from the previous decade
1891	137,442	33,328	24.25	
1901	173,325	43,894	25.32	
1911	229,613	81,663	35.56	+37,772
1921	304,437	96,386	31.66	+14,723
1931	382,450	114,000	29.80	+17,614
1941	513,010	NA	NA	
1951	639,029	229,216	35.86	+115,216
1961	1,142,005	417,725	36.57	+188,509
1991	2,757,205	480,757	17.40	+63,032

The date for the number of migrants has been taken from the Census books of the respective years for 1901–1941, from the Census of Bengal. For 1951, it is taken from the Census of Assam, Manipur and Tripura (1951), Vol. XII-pt. II A, pp.112–139, for 1961 from the Census of India (1961) vol. XXVI – Tripura pt. I (i), and for 1991 f Census of India (1991) Series I India, pt. V-i) Series Migration tables, vol. I, table D-i (India, States and Union Territories, p. 257

'place of birth' of the people enumerated in Tripura; those not born in the state are grouped under the category of immigrants. Thus, it would seem that the number of immigrants does not reveal the actual decadal variation but the people born outside the state, regardless of the dates of their immigration. In such a situation, the children of the immigrants are not taken into account, suggesting that the nonindigenous population would be much higher than what is suggested by the number of immigrants.

11.8.7.4 *When Did 'Tripurs', the Principal Tribe, Turn a Minority in Tripura*?

It is very difficult to say when exactly their strength dwindled to less than 50 % of the total population. As seen earlier in 1891, their strength was just around 50 % (50.8 %). With ever increasing immigration, their strength declined to 31.5 % following the influx of Hindu refugees from East Pakistan and remained at that level till 2001, when their strength was 31.05 % of the total population. It may be noted that there was a general spurt in the tribal communities between 1951 and 1961 and there was an incredible increase of 87 %, from 192,293 in 1951 to 360,070. But, a corresponding increase of over 78 % in the general population more than offset the increase in the population of Scheduled Tribes.

11.8.7.5 The Myth of Tribal Majority

That the tribal population of Tripura commanded a majority in the population is a myth. As early as 1891, the population of Tripuras and Kukis together accounted for

only 47–45 %, and if the Buddhist population of Chakmas was added, the number just crossed 50 %. The population distribution in 1891 was as follows:

Hindus (pre-conversion, traditional)	30,351	22.08 %
Muslims	37,086	26.90 %
		49.00 %
Tipperahs	61,314	44.60 %
Kukis	3,824	2.80 %
		47.40 %
Buddhists	4,734	3.90 %

That the tribal population is reduced to an absolute minority is obvious, and it is rightly attributed to the immigrant population of displaced persons from Bangladesh but that they were ever the sole inhabitants of Tripura or that they accounted for over 70–80 % of the population at any stage is yet to be established.

11.8.8 The Nontribal People of Tripura

The nontribal population of Tripura comprises the Bengali-speaking Hindus and Muslims who together constitute more than two-thirds of the state's population and some immigrants from other parts of India. Though a large section of the tribal population has adopted Hinduism and even speak Bengali as a second language, they retained their tribal identity, their native language '*Kok Borok*' as their mother tongue, besides a distinct cultural identity.

Bengali-speaking Hindu and Muslims share a common heritage of ancestral homeland, Bengal and Bengali as their mother tongue. Religion has not divided the Hindus and Muslims of Bengal and Tripura linguistically. The Muslims, a minority with just 8 % of the population of Tripura, live in relative harmony in Tripura forgetting their antagonism in Bengal. The local and immigrant Bengali population have benefitted from the faith, language, culture and learning of the royal house of Tripura. Much before India's independence (1947), the Maharajas of Tripura had embraced Hinduism and attained the title of 'Mahamanikya' and adopted Bengali as the state language and even the caste system of the Hindus. The king of the state encouraged the tribes of the state to adopt Hinduism, a fact that explains over 85 % of the population enumerated as Hindus. Deeply interested in Bengali literature, many Bengali litterateurs visited Tripura to promote Bengali literature and culture. In this process of acculturation, Nobel laureate Rabindranath Tagore had a special place. By his presence as a royal guest, he inspired confidence among the people. The period between the late nineteenth and early twentieth century represented the golden period of Tripura state with phenomenal growth in propagation of Bengali and development of art and culture. There was, thus, a fertile ground for the growth and development of Bengali language and culture even before the arrival of the immigrant Bengali. Tripura, lying on the border of Bangladesh, is more an outlier of West Bengal than a continuum of Bangladesh, and the Bengalis of Tripura are

a clone of Bengalis of West Bengal, getting inspiration from their cultural and intellectual achievements centred around Kolkata and Santiniketan. The Bengalis of Tripura, largely middle-class Hindus from Bangladesh, have brought with them agricultural enterprise and a culture symbolised by Rabindra Sangeet (a type of music form initiated by Nobel laureate Tagore), dance and dramas, and above all '*Durga Puja*' – a weeklong festival celebrated by Bengali Hindus during the worship of Goddess Durga. The Bengali Hindus of Tripura, like their counterparts in West Bengal, have retained surnames which reflect their castes. Yet, chastened by the ordeal of forced migration, they have attained a new identity and live harmoniously. The Bengali Muslims have their 'Ramadan' and 'Eid' festivals.

The transplant of Bengali culture is further encouraged by active support of scientists and educationists from West Bengal. One, therefore, finds a substantial presence of Bengalis from West Bengal professionals, teachers, engineers, doctors and lawyers, together making a corps of professions who are actively promoting the economy of the state. The people of Tripura are a different lot from other states of the North-East, with minimal protests, keeping good relations with neighbouring Bangladesh, quietly engaged in the process of state building.

The Bengalis of Tripura, with all the trappings of their religion, culture and literature and with a renewed sense of enterprise have not only survived in their new adopted homeland but even actively promoted the economy of the state.

11.9 The People of Meghalaya

For long the plateau of Meghalaya, now Meghalaya state, has been the home of two ethnic communities, the Khasis and the Garos, unrelated to each other in their origin and history but geographically juxtaposed in their territorial location. The situation changed slightly after the arrival of the British colonial rule in the early mid-nineteenth century when migrants from neighbouring provinces of Assam and Bengal and subsequently from other parts of India arrived as a part of the entourage of colonial administration. Many of these early migrants, more significantly the Bengalis, who arrived in large number, being acquainted with the British administrative set-up, became permanent inhabitants of Meghalaya and slightly modified, if not changed, the demographic composition of the state. After independence, others like Assamese-, Nepali- and Hindi-speaking people joined, increasing the nontribal component of the population. Today the Scheduled Tribes, as defined by the Indian Constitution, form 86 % of the total population of the state, and the remaining 14 % is accounted for by Bengali-, Nepali-, Hindi- and Assamese-speaking people. The Khasis and the Garos, the two major indigenous groups, make only 78.5 % of the population of the state, while the remaining 7.5 % tribal population is constituted by immigrant tribal groups like Hajongs, Rabhas and Karbis, the former two having migrated from Brahmaputra valley and the last one from the Karbi-Anglong district of Assam. These latter tribal groups occupy the fringe of the plateau, in proximity to their core areas of settlement (Fig. 11.7).

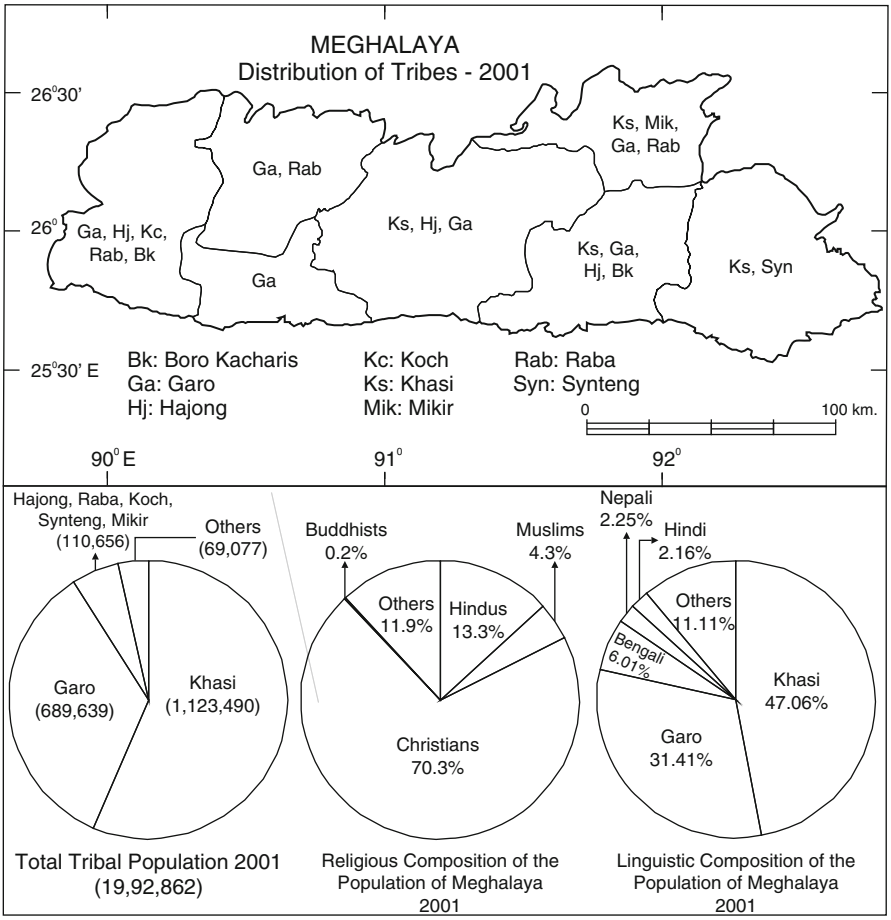

Fig. 11.7 District-wise distribution of different scheduled tribes of Meghalaya: their religious and linguistic composition (as per the Census of India-2001)

The data published by the Census of India give tribe-wise and district-wise population of each tribe in the state (Table 11.19).

11.9.1 The Principal Ethnic Group of Meghalaya: The Khasis

The Khasis, known as Hynniewtrep (seven huts), suggesting an origin from seven ancient families, include also the Syntengs or Jaintias, speak a Mon–Khmer language and are different from the surrounding Mongoloid people speaking Tibeto-Burman languages.

Table 11.19 Principal tribal groups of Meghalaya – 2001

Tribal group	Persons	% of the state's population
1. Khasi, Jaintia, Synteng	1,123,490	47.05
2. Garo	689,639	29.74
3. Hajong	31,381	1.35
4. Rabha	28,153	1.21
5. Koch	21,381	0.92
6. Karbi/Mikir	11,399	0.49
7. Any Kuki tribe	10,085	0.43
8. Any Mizo tribe	3,526	0.16
9. Any Naga tribe	3,138	0.14
10. Bodo–Kacharis	2,932	0.13
11. Hmar	1,145	0.05
Others	60,592	2.87
Total tribal population	1,992,862	85.94
Total nontribal population	325,960	14.05
Total population of the state	2,318,822	99.94

Source: Census of India (2001b)

For long, the origin of the Khasis was shrouded in mystery. It was only in the last quarter of the nineteenth century or early twentieth century that philologists found a clue to the Khasi language and, in turn, to the Khasi people. '*T*hanks to the labours in the linguistic field of Grierson, Logan and Kuhn and last but not least Peter Schmidt of Vienna, we know that the languages of the Mon-Khmer group in Burma and Malay Peninsula are intimately connected with Khasi' (Gurdon 1914:15). On the basis of a similarity among the Mon–Khmer languages by E. Kuhn (1889) and reaffirmed by his personal observation, Grierson wrote the following: 'Incursion from the north of tribes speaking Tibeto-Burman languages, and in later times from western China of members of Tai race, have driven most of the Mon-Khmer speakers to the sea-coast; so that, with a few exceptions, all the languages of this family are now found in Pegu, Cambodia and Anam. The exceptions are some tribes who still hold the hilly country of the Lower and Middle Me-Kong and the middle Chindwin and the *Khasis*, all of whom are islands of Mon-Khmer origin standing out amidst seas of alien people' (Grierson 1903).

Grierson divided the languages of Mon–Khmer family into five groups,[15] one of which was 'various dialects of Khasi language'. He also established similarity between Mon–Khmer vocabularies and Munda languages of Central India and Nancowry language of Nicobars. The observations were pursued by several linguists who confirmed his observations. Following Grierson's investigations on Kambojas,

[15]The five groups referred by Grierson include (1) languages of Middle Mekong; (2) Mon and Talaung spoken by Pegu; (3) dialects of Khmer spoken in Cambodia; (4) Palung–Wa group spoken in northeast of Mandalay and other languages spoken around the upper and middle courses of Chindwin, like Khamuk, Khmu, Lemet and Riang; and (5) various dialects of Khasi.

Kuhn published a summary of his own article (*Das Volk der Kamboja bei Yaska*) in support of Grierson in the 1912 issue of the *Journal of the Royal Asiatic Society*. The last of this group of linguists was S. K. Chatterjee (1950) who thought of 'the Khasis an island of Mon-Khmer (Austric or Austric Asiatic) speakers within the original Bodo area. They are by race Indo-Mongoloid, but their language is different'. Others, like Rev. Roberts in the introduction of his Khasi grammar, stated that 'The tradition connects them (Khasis) politically with the Burmese, to whose king they were, up to a comparative recent date, rendering homage, by sending him an annual tribute in the shape of an axe, as an emblem merely of submission'. It is quite likely that the tradition among the Khasis of their having arrived from the north, perhaps through Burma, is a part of their history. The Khasis, it is likely, reached the Sylhet region as the terminus of their wanderings, from where they were driven by a great flood to the safety of what is known as Meghalaya plateau. They usually refer to a flood in which they lost all records of their history. While allusion to flood appears quite plausible in the light of low lying territory around Sylhet, often subjected to flood, their belief of having lost the historical records appears untenable. If they were literate enough to produce a historical record of their origin, they could have reconstructed partially if not wholly the lost record. It appears quite plausible to think that the Khasis journeyed via Manipur, North Cachar Hills, the Cachar plain and Sylhet and finally reached their present habitat.

11.9.1.1 The Clan and the Family Among the Khasis

The Khasis have an oral tradition called '*Ki Parom*' from which they derive meaning and inspiration for their sociocultural organisation, and the single most important aspect of Khasi society is the matrilineal system, as is reflected in the term Khasi itself. Split into two syllables Kha and Si, the term means ancient mother (Kha means mother) and suggests the basic philosophy of inheritance that spawned the idea of matriliny. A similar term *Synteng*, a group living in Jaintia Hill region, implies children of ancestral mother (Bareh 1964). Jaintia, according to Bareh, seems to be an Aryanised form of Synteng (Photo 11.5).

A clan is known as a '*Kur*' among the Khasis, and its evolution includes generations of people tracing their descent to a common maternal ancestry, bound together by religion, ancestral worship and funeral rites. Most clans came into being during the period of migration (Bareh 1964:115). In course of time, the original matriarch's name is replaced by one of the successor mothers. This leads to a multiplication of clan. Some of the notable clans among the Khasis are Lyngdoh, Kharkonger, Dingdoh, Sohkhlet, Marbaniang and Symlieh. The most prominent Khasi group, the Khynriam, occupying the high plateau in the vicinity of Shillong, consists of several clans like Kharkonger, Khongweer, Ran, Lyngdoh, Mawlang, Symlieh, Dokhar and Nongkhlaw. And even after adopting Christianity, the Khasis adhere to their clans which pass down the female line.

The family organisation among the Khasis centres around the mother in which capacity she acts as a keeper of hearth and kitchen and of a Khasi home possessing

Photo 11.5 A Khasi lady selling fruits in a Sunday market, 30 km south of Shillong

an authority over property (Bareh 1967:321). The family house is known as '*Ka ling seng*' in Khasi which literally means foundation house, which in simple terms may be called ancestral home. Since clan and ancestry are defined by mother, it could also be called the *house of the mother* which on her death is inherited by her youngest daughter. The mother performs all the rites and rituals as head of the family, often helped by her brothers. The uncles, brothers of the mother, have an important advisory role in the family. In matters of inheritance, the largest share is given to the youngest daughter who is the heir of the family fortune. The eldest daughter gets some token property, but the sons get nothing except some gifts. The *Wars*, a Khasi group, of southern region are an exception, where matrilineal as well as patrilineal system exists.

The marriages of the Khasis who are Christians take place in the church following to Christian rituals. Non-Christian Khasis follow a system that largely resembles the one practised by Hindus, including marriage processions.

11.9.1.2 The Regional Distribution of the Community and Their Groups

There are well-defined territorial groups among the Khasis. These are named after the physical characteristics of the region occupied by them and their ancestry. Thus, most of the Khasi groups reflect a relation with their environment. The influence of environment is clearly reflected in the names assigned to different Khasi groups.

For instance, the 'Khasis proper' call themselves 'Ri-Lum' (Singh 1998–5:1703). The phrase actually refers to an irregular plateau at a higher elevation. Similarly, *War* is the region on the southern edge of the plateau and is adopted as a group name like War Khasis by the Khasis inhabiting that region. In fact, each of these regions has lent its name to the group of Khasis inhabiting it.

Thus, there are five region-specific recognised groups:

Khasi group	Present area of their habitat
1. Khynriams or Nonglums (Khasi proper)	East Khasi district, specially Shillong region
2. Syntengs or Pnars	Jaintia district
3. Wars	Area around Cherrapunji
4. Bhois	Ri-Bhoi district
5. Lyngngam (also written Lyngam)	West Khasi district

Bareh (1964) has added another Khasi group, called Amwi, who formed the parent tribe of the present Khasi–Pnar group.

These groups occupying specific areas have remained in their present habitat for centuries with minimal migration, except those who were living on the margins of the plateau. Secondly, they are named after the Syiemships[16] of which they were once a part.

Before the formation of a full-fledged state, Meghalaya had only two administrative districts, viz. Garo Hills and United Khasi and Jaintia Hill districts. The latter had a number of Syiemships confined only to Khasi Hills area. 'The Khasi hill division alone had sixteen native states called Syiemships, three native states called Lyngdohships, one native state called Wahadarship and five others called Sirdorships' (Bareh 1967:13). The 16 Syiemships were (1) Khyrim, (2) Mylliem, (3) Nongkhlaw, (4) Cherra, (5) Rambrai, (6) Myriaw, (7) Nongstoin, (8) Nobosohpoh, (9) Mawing, (10) Nongspung, (11) Mawsynram, (12) Maharam, (13) Malai-Sohmat, (14) Langrin, (15) Bhowal and (16) Jirang. The three Lyngdohships were Mawphlang, Sohiong and Lyniong. The five Sirdars were (1) Dwara-Nongtyrnem, (2) Mawdon, (3) Mawlong, (4) Nonglwai and (5) Pamsamgul. The only Wahdadarship was Shella.

Before these *syiems* were forced to accept the sovereignty of the British, many *syiems* revolted against the British, the chief among them are U Tirot Singh, the king of Nongkhlaw, and U Kiang Nongbah, a Jaintia patriot who died a martyr at the hands of the British in the cause of freedom in 1861 (Kyndiah 1990). To commemorate the valour and patriotism of these Khasi heroes, Martyr's columns are erected in

[16] A Syiemship, a Lyndohship or a Sirdarship was an important aspect in the territorial organisation and democratic governance of Meghalaya plateau during the precolonial days. The plateau then, particularly the eastern two-thirds, presently occupied by the Khasis, was administered by a number of *syiems*, who controlled a specific territory and presided over the interests of a clan. A specific syiemship was also a congregation of clans, or a group of clans, collectively known by a specific name. During the medieval period there were 18 such syiemships, and even during the British period, some of these syiemships existed and were known as Khasi Estates, albeit under the overall suzerainty of the British crown.

the memory of the former at Nongstoin and for the latter at Syntu Ksiar, on the bank of the river Myntdu, the 'Blue Danube of Meghalaya'.

These syiemships are now replaced by Autonomous District Councils, and the syiemships remain only titles used by many, a phenomenon that suggests the pride of the people in their ancestry.

11.9.1.3 The Khasi Groups

Each of these Khasi groups mentioned earlier has a number of clans. The Khyniriam group, for instance, has two subdivisions, the Syiem and Lyndoh, and has several matrilineal clans like Kharkonger, Khongweer, Ran, Lyngdoh, Mawlong, Symlieh, Dokhar, Kharbuli, Nongkhlaw, Warjari and Diengdoh (Singh 1994:1705).

The principal defining elements in Khasi society is their matrilineality and a democratic system in organising their syiemship and choosing their syiems. The division and inheritance in the society is based on matriliny and '*kur*' an equivalent of a clan. A '*kur*' is an exogamous unit in which every member is a kin of every other person of the same '*kur*'. It rests on the belief that they all have descended from a common female ancestry. 'Accordingly, the clan exogamy is practised, and well defined relationships exist within which marriage is prohibited' (Karna 2005:117). The organisation of syiemship also takes into account only the clan, and even an expansion by absorbing the neighbouring syiemship does not change the status of the syiem's original family.

The Khynriams

The Khynriams are a representative Khasi group occupying the highland around Shillong. Having embraced Christianity and being located in the Hinterland of Shillong, for long the capital of Assam, they are the most progressive of the Khasi groups. The educational institutions at Shillong established by Christian missionaries enabled them to get modern education, and the urban and administrative environment of the region brought them a measure of awareness that led to the growth of Khasi language and literature. Education also fostered among them an approach to life that was more based on reason and less on traditional beliefs and rituals and finally to a political movement that after years of up and downs resulted into a full-fledged state of Meghalaya.

The population of Khynriams, i.e. Khasi proper of Shillong region, may be touching a million mark as they numbered about 800,000 in 2001 (796,885 – 2001). This is about 70 % of the total Khasi population and about 35 % of the population of the state. The Khasi society today is not what it used to be in the early nineteenth century when the British closed the syiemship of Nongkhlaw in 1833. Conversion to Christianity, evolution and growth of Khasi language and literature through the adoption of Roman script, production of books and gradual enrichment of Khasi literature brought about a change in outlook and attitude towards education and

science. They have created a literature that is the envy of almost all tribal groups of the North-East. The nineteenth-century poet U Soso Thom, the Khasi poet Laureate, followed by several other writers, enriched the Khasi literature to an extent that the Khasis are justly proud of it. An awareness of individual rights and above all the emergence of a leadership, moulded by a modern politico-economic reasoning, combined to transform the community beyond recognition. It is difficult to find a *duma* (hookah) smoking and *kwai* (areca nut) cutting turbaned Khasi, as one could find in old books. The modern Khasi is a citizen proud of his ancestry and culture but ever ready to assimilate all modern ideas. Despite the sociocultural advancement, largely confined to urban Khasi elite, the countryside Khasis still practise shifting cultivation with poor yield and grow wet paddy in the valleys with relatively flat bottoms, only with the help of hired labour, a Nepali or occasionally a Bangladeshi.

The Khasis have not taken to family planning and would not like to see their number dwindling. The Khasis, specifically the Khynriams resisted the domination by the British in an unsuccessful attempt to guard their independence and culture. For long a part of Assam, they resisted the imposition of Assamese language and succeeded in having a state of their own with Garos as the second important tribal group in the state.

Khasi/Syntengs/Pnars

Khasi/Syntengs/Pnars – are the Khasis of Jaintia Hills district, which was annexed by the British even before they took over Khasi Hills. The most important group among the Syntengs of Jaintia Hills is formed by Pnars who live in Jawai subdivision of the district. Shangpung is the original village where the first settlers arrived (Banerjee 2004:163). The Pnars are an endogamous group, a matrilineal society in which following the principle of ultimogeniture, the youngest daughter inherits the property of her mother with many privileges. A peculiar tradition among the Pnars is that the husband does not stay with his wife and visits her in the night only to return to his matrilineal house early next morning (Banerjee 2004). He is not considered a member of his wife's matrilineal unit.

The total number of Pnar-speaking Khasis is estimated to be around 275,000 (241,655 – 2001), forming over 20 % of the entire Khasi population of Meghalaya. Like other Khasi groups, Pnars have embraced Christianity. Professionally, a large number of them still practise *jhuming*, the slash and burn cultivation, but also benefit from wet irrigation, particularly in the eastern part of Jaintia hills marked by long depressions in undulating terrain. Pnars are known for their betel leaf gardens, which were an important source of betel leaves in Sylhet market during the British days. As is known, the Khasis themselves are inveterate chewers of areca nut and betel leaf, and there is considerable demand for betel leaves produced by the Pnars. The Pnars also engage themselves in mining of coal, which occurs in the district, and quite a few of them have lately started developing pear orchards. Some of the Pnars are migrating to Shillong for a better life.

The Khasi/Wars

The War group of Khasis are distributed in thirty odd villages in the southern part of East and West Khasi Hills district. Some of them are early migrants from Bangladesh who migrated to the region during the partition of India in 1947 and settled in the southern part of the state. Like other Khasi groups, the Wars also consist of a number of clans. The law of inheritance among the wars is at variance with that of other Khasi groups and both sons and daughters inherit the property. The headship of the family is with a senior male member of the family. It appears that the system of matriliny is discarded in War region under the influence of the society in neighbouring Bengal, where males own and inherit property. In War region, there are, besides Christian Khasis, Hindu and Muslim Khasis and a small number that follows the traditional Khasi religion. The Khasi Muslim community is represented by the progenies of the Muslims, especially traders, who married Khasi women. The children, if they adopt the surname of their mothers are treated as Scheduled Tribes. Those adopting their father's surname remain Muslim.

Bhois–Khasi

This group refers to the Khasis occupying the Bhoi lowland on the northern margin of the plateau, known as Bhoi territory. Some believe that the Bhoi–Khasis migrated to this region from Jaintia hills after the annexation of that territory by the East India Company in 1835. It is also suggested that many of the Bhois are really Mikirs (Karbis) who have adopted the language and customs of the Khasis. Bhois, like the other Khasi groups, follow a matrilineal system and are monogamous. They have established good relations with their neighbours like the Garos and Assamese. While speaking the Bhoi dialect of Khasi language, they are often found to be multilingual because of contact with other communities in the area. Divided into a number of clans, they show the regional influence in the names of their clans like Lapang, Dorphang and Nihang, or Moksha and Songkali. The village councils known as 'Durbar Shnongs' or village Panchayats, the 'Durbar raids' are active in Bhoi region. Besides agriculture, especially shifting cultivation, the Bhoi–Khasis follow a number of supplementary occupations like fishing, hunting, basketry and collection of forest produce.

Khasi–Lyngnam Group (Also Spelt as Lyngngnam)

They are a major Khasi tribe occupying the West Khasi Hills district, particularly its western part. There is a tradition that Lyngnams have a Garo origin and embraced Khasi customs. They speak a Khasi language and have at best a 'Garo–Khasi' hybrid ancestry. Even today, the Lyngnams intermarry with the Garos. Monogamous, this group of Khasis has extended its matrilineal system to the neighbouring Garos on the west. Their family organisation and succession follows the Khasi pattern.

11.9.1.4 Habitat and Economy of the Khasis

Unlike the Nagas of Nagaland, the Khasis of Meghalaya live in 2,450 small villages, often a couple of kilometres apart from each other, being slightly closer apart in East Khasi district and farther apart in Jaintia Hills area. The average population of a village is a little over 300.

These villages are not, as one may imagine, following the pattern of Naga and Mizo villages, located on hilltops. Often, they are sited on the lee side of the hills or in a depression to get protection from strong winds. Moving up from the village, towards the hill one encounters the sacred grove, where the village worship 'U ryngkew U basa', the tutelary deity of the village. The sacred groves are not more than a few hundred yards away from the village. The Khasi houses are usually huddled together and 'there was no specially reserved areas for the nobility' (Gurdon ibid.:33). The old type of thatch and timber houses of yore has given place to *pucca* houses and today one does not easily find a thatched house. Formerly, the villages in northern Meghalaya, i.e. Ri-Bhoi region, and in Lyngnam area, coinciding roughly with West Khasi district, were seldom permanent and moved every 2–3 years, developing a new settlement in a clearing. The situation has changed today and the villages, even in these regions, have a permanent site.

The Khasis depend largely on farming, usually shifting cultivation on upland and wet rice cultivation in the valley. The War region is known for orchards of areca nut, betel leaves and Khasi orange. The traditional hunting and fishing have virtually disappeared, though grazing still finds a place in the economy of the community.

The elites among the Khasis have entered public life and occupy some of the highest positions in administration and educational and scientific institutions.

Religion

The traditional Khasi religion was variously known as '*Ka Niam Khasi*', '*Ka Niam Tre*' or *Chnong*, but only a small minority practices the traditional religion, as about 90 % of the Khasis have embraced Christianity and participate in Sunday congregation. Yet, Khasis have inherited certain ancestral commandments, which are considered integral part of society's moral conduct and by extension of religion. These are:

1. *Kamai ia Ka Hak* – This is to earn righteousness by one's own life and effort
2. *Tipbriew–Tipblei* – To be conscious of God, one has to be aware of man through service.
3. *Tipkur–Tipkha* – That means the relations from the side of the mother (*kur*) and the relations from the side of the father (*kha*) to be married with respect for each other.

Political Organisation

While the Khasis are domestically and socially organised in a Kur based on matriliny, politically, they were organised in small states, known as syiems, some large and some others not so important.

The traditional administrative arrangement under which each village had a Lyngdoh, a Sirdar and a headman as the functionaries of the village who demarcated their own jurisdiction has since changed (Gopalakrishnan 1995:116). The Syiem directed the functionaries of the state. A Syiem was elected, though the syiemship was given to the first son of the eldest daughter of the Syiem. The Syiems exercised their powers and performed the functions of the state with the help of *Durbar* or a council. Besides the syiems, there were *Durbar Kurs* or clan councils, which exercised authority over the members of the clan. In a syiem there may be several clans. The clans also have the Durbars, known as *Durbar Kurs*. These syiemships have since ceased to exist, yet the Khasi surnames like Syiemlieh and Lyngdoh bring to one's mind the British administration of Khasi land, suggesting the existence of a well-organised orderly society that believed in democratic values.

The Khasis, as a people, are very different from the other tribes of the North-East, with a history of minimal violence, where headhunting was restricted only to wars, sacrifices to ritual practices and theft to neighbourly cattle lifting. They were occasionally called 'troublesome marauders' by the colonial rulers, following punitive attacks they organised to punish the offending villages in Surma valley. Their love for music and literature is unique, as seen in the poems of U Soso Tham, whom they describe as Khasi poet laureate, and the frequent rock shows in Shillong. Yet, despite all the glory associated with their past, the Khasis have not settled down to a life of peace; and no excuse is too trifle to restrain them from taking to protests.

11.9.2 The Garos

Spread over an area of over 8,000 km^2, occupying over a third of the western part of Meghalaya, are the Garos, a tribe very distinct from the Khasis and ethnically and linguistically allied to the Garo–Kachari ethnic group of Brahmaputra valley. With a population of over a million, the Garos form over 30 % of the population of Meghalaya and the second largest ethnic group in the state. They are primarily spread over three districts of the state, viz. West Garo Hills, East Garo Hills and South Garo Hills. Tura town, the headquarters of West Garo Hills district, is the focal point of Garo society. Besides the three districts of western Meghalaya, the Garos are spread in the neighbouring districts of Assam, principally the districts of Goalpara, Kamrup and Dhubri, and can also be traced further into Darrang, Nagaon and Bongaigaon districts in Brahmaputra valley. It may be mentioned that the Garos have a substantial presence in Bangladesh notably in Mymensingh and Sylhet districts, contiguous to their core area of western Meghalaya, thus adding another 200,000 people to their population.

The Garos call themselves Achik–Mande, meaning hill people. The word '*Achik*' meant hill and '*Mande*' signifies people. They also refer to themselves simply as 'Achik' or 'Mande'. Goswami and Majumdar (2004) divided them principally in two groups:

1. Christian Converts
2. Non converted – also known as 'Songsarek'

Photo 11.6 Garo family in West Garo Hills, 30 km north of Tura

This appears a crude division of the Garos, but most of the traditional ways of living and ritual practices refer to the second group, as the Christian section of the Garos, an overwhelming majority, believes in Christianity and its religious mores, though in matters of social organisation almost all Garos follow the age-old system. Ethnically, the Garos are a Mongoloid people, allied to Boro-Kachari group and speak a language that is akin to Bodo language. It appears that the Garos spread to their present habitat from the Brahmaputra valley, leaving behind a large residual population in Goalpara, Kamrup and Dhubri districts. Garos maintain good relations with the neighbouring tribes like the Hajongs, Rabhas and Koches besides Bengali and other Hindu inhabitants of the Brahmaputra plain.

11.9.2.1 Social Organisation

The entire Garo tribe of Meghalaya consists of a number of clans, called Ma'chongs (Machongs). These '*machongs*' are exogamous and members of a '*machong*' are found in widely separated areas and are not specific to a territory (Photo 11.6). Playfair (1909) identified 127 clans, but 100 years later, it is impractical to identify these clans. The individuals take their clan title from their mothers, though the clan itself may be named after some place or territory. It seems that the Garo clans are not named after a common ancestress. On the contrary, most Garo clans, despite their being matri-clans, are named after places, such as Bangbonggre and Adokgre. Here the suffice 'gre' indicates the name of the village (Goswami and Majumdar 2004). Some of the clans are also named after plants and animals.

Mahari is the most important unit in a Garo clan organisation and consists of a group comprising close matri-relations from within the 'machong'. Its rights extend even to land. The entire land within an *aking* (territorial jurisdiction under the ownership of the *mahari* in the hill area) is considered the property of a particular *mahari*, controlled and managed by its headman, known as *nokma*.

A group of 'machongs' form what is called a *chatchi*. It is a constellation of 'machongs'. There are five well-recognised *chatchis* given below in the order of their importance.

1. Sangma
2. Marak
3. Momin
4. Sira
5. Areng

Thus, there is a three-tier organisation of Garo society, the first order division being the *chatchis*, further divided into *machongs*, which in turn have several *maharis*. A Garo name is, therefore, expressed in three parts; first name, followed by his/her *machong* name, suffixed with the name of the *chatchi.* Among the chatchis, Sangma and Marak are by far the most important and have many clans or machongs in their fold. Areng and Sira, as chatchis, are composed of a single clan. The Momins, on the other hand, according to their folk tales are believed to have a Muslim ancestry. It is said that 'a girl of Gabil clan was married to a Muslim; and according to Muslim customs, the father gave the surname 'Momin' to the children'. Subsequently the female children of this Muslim transmitted the name to their children according to Garo custom, and this gave rise to Momin chatchi (Rongumuthu and Dewansing 1960). The Momin tribe is limited to a small tract bordering the plains of Bangladesh and never found among the most conservative section of the Garos (Goswami and Majumdar 2004). In the small area, just over 8,000 km^2 (West Garo, East Garo and South Garo Hills) that is occupied by the Garos in Meghalaya, they speak as many as 12 dialects. They have adopted, like the Khasis, Roman script for their language, and there appears enough literature in the language to warrant a Master's level programme in Garo literature at Tura Centre of Postgraduate Studies of the North-Eastern Hill University.

The nineteenth-century history of Garo Hills, as known through the writings of British administrators, is very unflattering. They were considered blood-thirsty savages (Playfair 1909). Dalton (1872:49), quoting Buchanan, observes that 'two fifths of the Garos are slaves … they are called 'Nokol' in contradiction to 'Nokoba', the free men …The slaves are well fed and cared for, they are generally the best looking people in the valley. It is from the possession of a large number of them that a man obtains influence amongst his tribe. Each great chief can go to war, each with a body guard of sixty such followers entirely devoted to him' (Dalton 1872:88). According to Dalton the name Garo was given to the community by the Hindus. They consider themselves as a cluster of three groups, viz. '*Nunya*', occupying what is today East Garo Hills, '*Lyntea*' the central tribe occupying what is today West Garo Hill and '*Abengya*' the remaining group with a specific habitat.

11.9.2.2 Ownership and Succession

Being a matrilineal society, the youngest daughter (Noknechik) inherits the property from her mother. The sons leave the house, after they are adults. But while the ownership of the property rests with the youngest daughters, the husbands manage the property and look after other domestic affairs. This implies that the men migrate to the wife's house after marriage. The tradition of bachelors' dormitory (*nokpante*) is declining in importance, and the influence of Christianity is all pervasive. Equality, as a basic mode of individual's place in the society, is always emphasised.

Today, Garos are essentially farmers practising shifting cultivation on the slopes and wet cultivation of rice in the valleys. Horticulture is appearing as an alternative to shifting cultivation on the slopes. Rice, maize, millet and tapioca are other crops grown by the community. Lately, large plantations of areca nut, banana, pineapple and cashew nuts have appeared in the area. Besides, cotton is grown as a cash crop.

11.9.2.3 Garo Village

A Garo village consists of residents belonging to one clan or 'machong'. The clan has the proprietary right over the village land, known as '*A'king*'. The management of the Aking rests with the village headman, the *nokma*, who is normally the husband of the heiress of the principal family of the village. He allots land, generally for jhum, to different families depending upon the requirement and capacity to work in the field. Private ownership is confined to parcels of wetland. The private property is inherited by family members and is never allowed to pass into possession of another clan.

The Garo houses, though appearing as huts, are known for their beauty, style and grandeur. A large Garo house, a hut known as *nokmong*, is usually elongated reaching a length of 25 m, divided into sections for hearth, sleeping, kitchen and water storage and even for fermenting wine, cattle shed and a pigsty.

Before they embraced Christianity, the Garos believed in a supreme God, called '*Rishi Salgong*'. Besides worshipping directly, they had a nonhereditary priest, called '*kamal*'. Today, almost the entire population follows Christianity, having adopted the faith through the intervention of Christian missionaries since the late nineteenth century. Majority of the Garos belong to Garo Baptist Convention. Despite their newly acquired faith, the Garos have not relinquished their traditional festivals like '*Wangala*' celebrated in October/November, as a matter of expressing gratefulness to the God of harvest. The Wangala celebration at Asanang, near Tura, known as 'Asanang Wanagala', with hundred drums, used to be once a very famous festival but is subdued under the influence of Christianity. Its place is taken by Christmas celebration in December, which has become the principal festival of the year. Besides these, the tourism department of the state organises a 3-day annual winter festival AHAIA at Tura to promote tourism.

A very industrious and proud people, the Garos appear aggrieved with their secondary status vis-à-vis the Khasis, in the affairs of the state. Distance from Shillong,

the capital of the state where almost all the important administrative, educational and economic institutions are located, puts the community to a disadvantage. Often the discontent erupts into violence, as the Garos aspire to have a separate state, independent of the Khasis.

11.9.3 Other Tribal Communities of Meghalaya

11.9.3.1 The Hajongs, Koches and Rabhas

Three other tribal communities that merit attention are the Hajongs, the Rabhas and the Koches. All the three related in their roots to the Garos are the offshoots of Bodo–Kachari ethnic complex. They inhabit the northern fringe of Meghalaya and are concentrated largely in West Garo Hills, especially in the area below 950 m ASL. They appear to have migrated from Brahmaputra valley, through Goalpara district on the gently rising land.

The *Hajongs* who number around 35,000 speak Hajong as their mother tongue, which is a dialect closer to Assamese, and use Assamese script. They are divided into two groups: the Khalals and the Hajongs proper. The Khalals claim to be Vaishnavites, and unlike other tribal communities, they have their gotra, viz. Kashyap, Bhardwaj and Bashistha, which are usually found among the caste Hindus. Often they use Assamese or Bengali surnames like Roy, Das, Sarkar, Burman and Biswas. They are considered the original inhabitants of Hajo in Kamrup. Rule of residence after marriage is patrilocal. Agriculture is their main occupation, supplemented by basket making, weaving and handicrafts of bamboo and cane (Mandal et al. 2002:16).

The *Koches*, a Tibeto-Burman group like the Garos, have declined in number and their total strength is a little over 30,000 in India. They are concentrated largely in West Garo Hills in an area that extends into Goalpara district. The Koches of Meghalaya, largely confined to West Garo Hills, represent a residual population of a mighty Koch kingdom. According to Dalton (1872:89), 'the grandson of Haju, Vishu Singh, with all the people of condition, apostatized the Hinduism, and took the name of Rajbangsis, those who declined finding they were treated as vile, adopted Islam'. It is quite likely that to escape conversion some of the Koches migrated to Garo Hills area. The *Rabhas*, a tribal community and a part of Bodo–Kachari group, are essentially a tribe of Assam, spilling over in Garo Hills. Unlike Khasis and Garos, most of the Rabhas whether in Assam or in Meghalaya are Hindus and worship gods and goddesses, viz. Kali and Kamakhya. The immigration from the adjacent areas has led to a sprinkling of tribal population foreign to Meghalaya. The most noticeable among them are the Karbis who have entered Ri-Bhoi district and East Khasi areas from Karbi-Anglong plateau. They are, however, not very numerous. All these tribes practise shifting cultivation and some on the border of Brahmaputra valley are regular farmers and depend only on wet cultivation.

Table 11.20 Religious composition of Meghalaya's population (2001)

	1971		2001	
Religion	Number	Percent	Number	Percent
Christians	475,267	47.0	1,628,986	70.3
Hindus	187,140	18.5	307,822	13.3
Muslims	26,347	2.6	99,167	4.3
Sikhs	1,262	0.12	3,110	0.1
Buddhists	1,878	0.2	4,703	0.3
Jains	268	0.02	778	0.03
Others	318,168	31.44	267,245	11.5
Total	1,011,699	99.85	2,318,822	99.83

Source: Census of India (2001, Population by religious communities, p. 6)

11.9.3.2 Religious Affiliation of the People

The religious composition of the state's population is as follows (Table 11.20):

An overwhelming large percentage of Christian population consists largely of tribal population, which adopted Christianity during the last 150 years. There are still some animists, but their number is small. The non-Christian population is represented by immigrants who arrived on the Meghalaya plateau in the nineteenth and early twentieth century, as part of the British administration and their entourage. These are permanent settlers of the state. A large majority of them are Bengalis or from the neighbouring state of Assam of which Meghalaya was a part. In addition, there are immigrants who arrive in the state for a specific tenure to work in different fields, like administration, education, services and trade and return after their tenure ends.

11.9.4 The Nontribal People of Meghalaya

The nontribal population of the state includes Hindus, Muslims and a minuscule number of other religionists. Except for Muslims who showed almost fourfold increase and the Christians who were noticed to have multiplied by 3.42 times, all other communities have declined in their relative strength. The most spectacular increase appears to be in the case of Christians, who accounted for less than half the population of the state in 1971 which jumped to over 70 % in 2001. The increase in the number of Christians appears to be the result of progressive proselytisation enabling the Khasis to give up their traditional faith and embrace Christianity. As for the Muslims, there has been continued migration from Bangladesh. Their number has increased from 26,347 in 1971 to 99,169 in 2001. These are the Muslims who often assist the Khasis in agriculture wherever wet cultivation is practised and take up even wage earning seasonally.

The Hindus, present in a sizable strength, though showing a relatively modest increase in population, are the petty traders who migrated to Shillong during the British rule, to cater to the needs of the city. But, more importantly, a large number of them, especially the Bengali Hindus, arrived here as an entourage of the British to assist in the administration of the state. They were professionals like teachers, doctors and engineers, and a large number of them were working as civil servants at all levels. Most of them were settled in Shillong, Tura and some lower level administrative centres. Many of the descendents of these first-generation Bengalis, who domiciled here, continue to live in the state, largely in Shillong and Tura. The second group of Hindus are the Assamese who remained in Meghalaya and adopted it as their home state, after the secession of the state from Assam. The fact that Shillong was the capital of the entire state of Assam during the British rule attracted people from all over. The arrival of a large number of Nepalis is a relatively recent phenomenon, not only limited to Meghalaya. All over North-East, Nepalis have a noticeable presence, largely engaged in dairying and transport. In fact, dairying and milk supply, not so popular with the Mongoloid population, is being popularised by the Nepalis. Often one finds them engaged in local transport. The nontribal people of Meghalaya, particularly the Hindus are centred largely in urban centres. Deprived of any right to property, they are either professionals working with administration, educational and medical institutions or own shops and restaurants without any permanent domicile right.

11.10 The People of Assam

Assam, the core area of North-East India, drained by two principal rivers of the region, the Brahmaputra and Barak, and formed by their alluvial plains, is inhabited by a mass of people, which is not quite homogeneous. The people settled in the state descend from different racial stocks, follow different religions and speak a variety of languages. Yet, there is an underlying unity, as all of them call themselves *Asamiya* and a majority of them speak the Assamese language. This absence of homogeneity could be ascribed to two main reasons, historical and geographical. Over the millennia, the Brahmaputra valley has witnessed successive immigrations of people, ordinary human groups which arrived to settle down in the valley and engage in economic activities to make a living and others with an idea of conquest to rule over the region and still others who arrived here as refugees. Thus, the state turned into a receptacle of different races and cultures. Multiple layers of humanity superimposed one over the other or interacting with each other came to represent what Nirad C. Chaudhuri (1965) called in the Indian context ‘The Deposits of Time’, a chapter in his famous book *The Continent of Circe.* All these cultural layers are not fossilised; they are active in the society and seek a legitimate place in the history and politics of the region. The geographical factors, on the other hand, have separated the two principal regions of the state, the Brahmaputra and Barak plains, each occupying a river valley, but lying on the opposite side of the geographical

divide formed by the Barail range. Thus, the two principal regions of Assam, the Brahmaputra plain that is often considered as 'Assam proper' and the Barak plain occupying the Trans-Barail area, developed into two cultural domains. While the Brahmaputra valley is inhabited by Assamese speaking people, the majority of the people in Cachar, Hailakandi and Karimganj – the districts that constitute the Barak plain – speak Bengali.

The population of Assam is composed of two major components, the indigenous people, commonly defined, following Indian Constitution, as those belonging to Scheduled Tribes, and others who follow a formal religion like the Hindus, Muslims, Christians, Buddhists or Jains. It must be mentioned that large sections of the Scheduled Tribes have embraced a formal religion, yet they are considered as Scheduled Tribes. Their tribal status is related to their ethnicity and adoption of a religion does not preclude them from retaining their tribal origin.

'The people of the state' is discussed in two parts: first, the indigenous people or those that come in the category of Scheduled Tribes and, second, those who are nontribals and who consider themselves culturally distinct from the tribal people. The nontribal people have a very complex and often convoluted sociocultural organisation, dividing them into innumerable smaller groups.

11.10.1 The Indigenous People of Assam

Unlike the peripheral states, like Nagaland, Mizoram or Meghalaya, which are predominantly inhabited by tribal people, Assam has a relatively small tribal population (3.13 million in 2001) that constitutes only 12.4 % of the population of the state. In no district of Assam, with the exceptions of Karbi-Anglong and North Cachar district, the tribals form a majority. The two districts, Karbi-Anglong and North Cachar district, have respectively 55 % and 68 % of their population composed of tribal communities, the former inhabited largely by Karbi and the latter by Dimasa tribes. Of the total population of Karbis in Assam, 84 % is concentrated in Karbi-Anglong district, and similarly 65 % of the total population of Dimasas is settled in North Cachar Hills. These districts could be termed as tribal districts. There are 23 scheduled tribes in Assam,[17] of which 14 are largely found in the two hilly autonomous districts of Karbi-Anglong and North Cachar Hills and the remaining are plains tribes spread across the state (Table 11.21). The presence of some of these tribes like the Lakhers or Man in the state is only notional, as only a few of them are located in the districts bordering other states (Fig. 11.8).

[17] The scheduled tribes in autonomous districts (Karbi-Anglong and North Cachar Hills) are (1) Chakma, (2) Dimasa-Kachari, (3) Garo, (4) Hajong, (5) Hmar, (6) Khasi/Jaintia/Synteng/Pnar/War/Bhoi/Lyngngam, (7) Any Kuki tribe, (8) Lakher, (9) Man (Tai speaking), (10) Any Mizo type, (11) Mikir (Karbi), (12) any Naga tribe, (13) Pawi and (14) Synteng. The tribes in other districts, excluding the autonomous districts, are (15) Barman in Cachar, (16) Bodo/Bodo–Kachari, (17) Deori, (18) Hojai, (19) Kachari-Sonowal, (20) Lalung, (21) Mech, (22) Miri and (23) Rabha (Assam – The Scheduled Castes, Scheduled Tribes (Amendment) Act 1976, Government of India).

Table 11.21 Districts with more than 10 % of their population enumerated as scheduled tribe

District	Percent of tribal population	District	Percent of tribal population
N. Cachar Hills	68.28	Darrang	16.60
Karbi-Anglong	55.69	Goalpara	16.03
Dhemaji	47.30	Marigaon	15.55
Kokrajhar	33.67	Bongaigaon	12.23
Lakhimpur	23.50	Jorhat	12.32
Nalbari	17.63	Sonitpur	11.60

Source: Census of India 2001, Final Population Totals, Table FTP-2

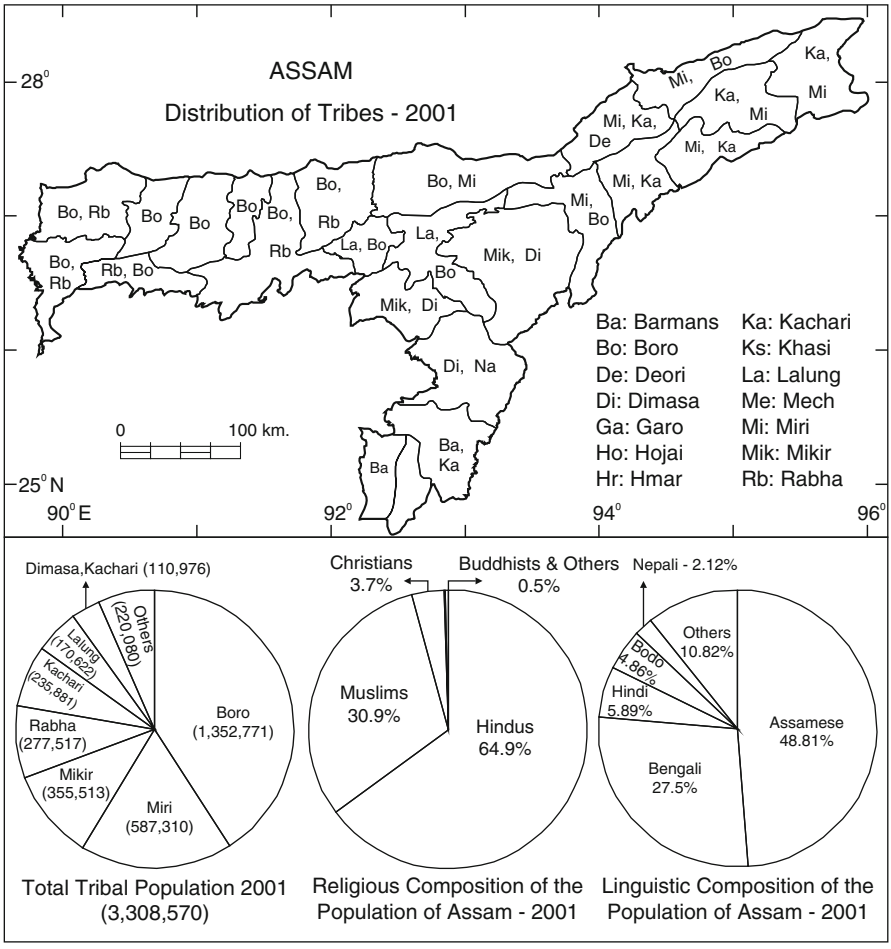

Fig. 11.8 District-wise distribution of different scheduled tribes of Assam: their religious and linguistic composition (as per the Census of India-2001)

Table 11.22 Important tribes in Assam (2001)

No.	Name of tribe (as per 2001 census) in order of their numerical strength	Population of the tribe in Assam
1.	Boro/Boro-Kachari	1,352,771
2.	Miri	587,310
3.	Mikir (Karbi)	353,513
4.	Rabha	277,517
5.	Kachari-Sonowal	235,881
6.	Lalung	170,622
7.	Dimasa-Kachari	110,976
8.	Deori	41,161
9.	Any Kuki tribe	28,273
10.	Any Naga tribe	21,706
11.	Garo	21,112
12.	Barmans of Cachar	15,877
13	Hmar	14,460
14.	Khasi/Jaintia/Synteng	12,722
15.	Mech	8,997
16.	Any Mizo	2,957
17.	Chakma	2,478
18.	Hojai	1,882
19.	Man (Tai speaking)	739
20.	Synteng	336
21.	Hajong	256
22.	Lakher	11
23.	Others	47,013
	Total	3,308,578

Source: Census of India (2001, State Primary Census Abstract for Individual Scheduled Tribes 2001, table A-11, pp. 19–30)

The tribal communities of Assam are predominantly of a Mongoloid stock, only a small number of immigrant groups like the Santhals, or a spill-over of Khasis from neighbouring Meghalaya, represent the Austric race. While the very early settlers like the Bodos are widely diffused and spread not only over Assam but even the neighbouring states of Tripura and Bengal, the latter immigrants like the Miris, despite their large number, have remained confined in small pockets in the eastern part of the state.

The first ten important tribes in Assam in the order of their numerical strength are as follows (Table 11.22).

In the State of Assam, there is a large immigrant Munda and Santal population, but these communities do not appear in the list of Scheduled Tribes of Assam. There are 240,770 Santali-speaking, 98,088 Munda-speaking and 72,311 Kurukh-/Oraon-speaking people in Assam (*Source*: Census of India 2001d, Statement A-9).

11.10.1.1 Bodo–Kachari Tribal Groups

The Bodos

This is the largest and most widely spread tribal group in Assam. The Bodos were, in all probability, the earliest settlers of Brahmaputra valley from where they spread in all directions, reaching as far as Tripura in the south and Arunachal and Nagaland in the north and east. The title 'Bodos' was given to the Kacharis by Hodgson (1847), though the subsequent literature usually refers to the community as 'Kachari'.[18]

Writing about Tibeto-Burman family of language, Grierson (1903) has discussed at length the origin and spread of not only the Bodo group of languages but also how the Bodos acquired different identities. It appears that the Bodo ethnic group in the late nineteenth or early twentieth century was known among their Hindu neighbours as Mech or Kachari. Those living west of Kamrup were called Mech and the others living east of Kamrup were known as Kacharis, and 'Bodo' or 'Bara' was the name by which the Mech or Mes and the Kacharis called themselves (Grierson 1903). Grierson also suggests that the Bodo community was named Kachari, following the alliance between the princess of Tripura and the Raja of Maibang who received in dowry the Surma valley now known as Cachar, including what is today North Cachar Hills. Since the Dimasas of North Cachar were called Kacharis by the Assamese, they extended, in due course, the term to include even the Boro kinsmen occupying the plains of Assam and North-East Bengal, an area practically co-terminus with the ancient kingdom of the Koch kings. Over the centuries, a number of Kachari groups acquired or were given different region-specific identities. Thus, as early as 1901, Grierson recognised eight distinct languages allied to Bodo group, each spoken by a specific regional community. These were True Boro (Kachari or Mech), Rabha, Lalung, Dimasa (Hill Kachari), Garo, Tripur, Chutia and even Moran, the last being completely Hinduised and speaking Bengali and Assamese fluently.

'The Kacharis are believed to be very closely allied to Koches, and also so far, at least, as language is concerned to the Chutias, Lalungs and Morans of Brahmaputra valley and to the Garos and Tippera of the Southern hills' (Gait 1906). In view that the Bodo language is so widely spread, 'it is not improbable that at one time the major part of Assam and the North-east Bengal formed a great Bodo kingdom' (Gait 1906). Some authors even believe 'that they ruled the whole of Assam until the 12th century and moved to western part of Brahmaputra valley and North Cachar Hills and the plain of Cachar in the 16th century AD to evade the Ahom onslaught' (Singh 1994). Singh seems to have equated the Kachari kingdom centred around Dimapur with the entire Assam, which is not the case.

The idea that the Kacharis/Bodos ruled the Brahmaputra valley for a fairly long period is supported by the fact that they have left the imprint of their language on physical features of Assam, particularly the names of the principal rivers with the

[18] Footnoote 1, Bryan H. Hodgson (1847).

Table 11.23 The subgroups of the Bodo–Kacharis (1881)

Communities influenced by Hinduism		Bodo group in the process of conversion		Bodos wholly converted	
Kachari	265,418	Rabha	56,285	Chutia	59,163
Mech	57,885	Madhai	13,149	Koch and Rajbanshis	336,739
Lalung	46,077	Mahalia	6,198		
Hajong	3,689	Sarania	4,718		
Garo (plains)	23,373	Totila	2,539	Total	**395,902**
Total	**396,442**	Total	**82,889**	Grand Total	**875,233**

Source: Census of India (1881)

syllable *di* which means water. This is seen in the name of the rivers like Dipula, Dikarai, Dihang, Disang, Dibang, Dihing and Diju.[19]

According to Endle (1961), the ancestral home of the Kacharis was in Tibet, and they migrated in two streams into Brahmaputra valley; one was through the valleys of Teesta, Dharla and Sankosh rivers, and the other was along the Subansiri, Dihang and Dibang rivers. Thus, very early in history, the Kacharis had the virtual control of the entire Brahmaputra valley under different names like Chutias and Morans, both of which were dispossessed of their small territories by the Ahoms. The later rule of the Kacharis – even when the Ahoms were in the prime of their glory – extended to western Brahmaputra valley under the Koch dynasty. It has to be noted that the Koches were initially Kacharis but after conversion to Hinduism assumed the title of 'Koch', with subsequent change to a Hindu caste 'Rajbanshi'.

The Subgroups Among the Kacharis/Bodos

The Census of Assam 1881 produced an elaborate division of the Bodo community, giving the extent to which each subgroup was proselytised.[20] The subgroups of Bodos, as given in 1881 census (Table 11.23):

If the population of the Garos of the hills (88,731) and other Boros numbering 19,752 is added to the total population of Bodos in 1881, it comes to 983,716, which is roughly 21 % of the total population of Assam in 1881. This stands in sharp contrast to the contemporary situation where the total tribal population of the state accounts for only 12 % of its population. It has to be noted that many of these communities like Chutia, Koch and Rajbanshi and Madhai are no longer considered as tribes, as they are fully integrated in Hindu society.

The Bodo–Kachari and Allied Groups in Assam

Today, the Bodo–Kachari group in Assam consists of the following tribes, though each of these tribes claims an independent tribal status and a … (1) Bodo–Kachari,

[19] Report on the Census of Assam (1881:63).

[20] Census of Assam (1881).

(2) Rabha, (3) Kachari-Sonowal, (4) Lalung, (5) Dimasa-Kachari, (6) Deori, (7) Garo, (8) Mech and (9) Hojai

These nine tribes allied to Bodo–Kachari group constitute over 8 % of the population of the state and 67 % of the state's tribal population. Though many of these tribes, at some stage in history, may have had affinity to the parent group, the Bodo–Kachari, but today, they have a very independent identity. The Dimasas, the Kachari-Sonowals, the Garos and the Deoris are too independent and have little to do with the Bodo movement for a separate state. The areas of the present distributions of these tribes are far apart and in many cases noncontiguous. They speak a different language. While Bodo language has secured a place in the Eighth Schedule of the Indian Constitution, as a scheduled language, Rabha, Lalung, Dimasa, Deori and Garo are recognised officially as nonscheduled languages confirming their independent existence. But despite the linguistic bond between these groups and a common lineage, each of these languages has an identity, independent of the group as well as other subgroups.

Although Singh (1994) has discussed Dimasa, Hojai, Madahi, Mech and Sonowal in association with Kachari, like Kachari-Dimasa or Kachari-Sonowal, here it was more relevant to treat them independently.

Bodos or Kachari-Bodos

This is the largest tribal group of Assam with a population of 1,352,771 in 2001. During the decade ending 2011, their population should have increased to 1.6 million. The Bodos speak 'Bodo' language as their mother tongue, though over two-thirds of them are bilingual, speaking Assamese as the second language. The group has a large number of clans, the principal ones being Sargwar, Basumatri, Musahoni, Narjari, Sibigri, Doimari, Gaya and Brahmari. These clan names are often used as surnames. The Bodos, the earliest colonisers of Brahmaputra valley, account for over 40 % of the total tribal population of Assam, and their strength in the entire population of Assam is just about 5 %. They are widely spread in Assam, with greater concentration in the lower Brahmaputra valley west of Guwahati. The highest concentration is in Kokrajhar district where the Bodos form over 30 % (31.7 %) of the population. Almost the entire tribal population of Kokrajhar is composed of this tribal group.

It appears that Bodos are concentrated more in the area north of Brahmaputra. Between Kokrajhar, the westernmost district of Assam, and Sonitpur, there is a dominance of Bodos. East of Sonitpur, there is an increasing dominance of Miris. South of Brahmaputra the presence of Bodo community thins out as one moves eastward from Guwahati (see Table 11.24).

The existing distribution is understandable as the Bodos migrating from the Trans-Himalayan Tibet to the Brahmaputra valley crossing Bhutan must have established their first settlement in the piedmont zone of Bhutan and slowly moved further south, leaving a strong presence in this zone to which they were fully acclimatised.

In 1971, about 95 % of the Bodo–Kacharis were followers of Hinduism and the remaining 5 % had adopted Christianity. The community gave up many aspects of its tribal culture under the influence of Guru Kalicharan Brahma, an early

Table 11.24 District-wise population of Bodos in Assam (2001)

District	Population of Bodos in the district	% of Bodo population of the total population of the district	District	Population of Bodos in the district	% of Bodo population of the total population of the district
Kokrajhar	287,265	31.70	Dhubri	22,208	1.35
Darrang	207,878	13.80	Nagaon	18,636	0.80
Nalbari	176,576	15.30	Marigaon	12,149	1.56
Sonitpur	140,293	8.34	Lakhimpur	8,194	0.91
Kamrup	140,023	5.55	Jorhat	4,787	0.47
Barpeta	117,120	7.11	Dibrugarh	3,529	0.30
Bongaigaon	102,610	11.34	Sibsagar	3,136	0.30
Dhemaji	42,991	7.51	Tinsukia	1,939	0.16
Goalpara	36,948	5.93	Other districts	383	0.03
Golaghat	26,106		Total Bodo population of Assam	1,352,721	5.07

Source: Census of India, District wise Population of Tribes – 2001

twentieth-century reformer of the community. Today, though they are categorised as Scheduled Tribe, it is difficult to distinguish them from other members of the Hindu community. They visit temples and *satras*, have developed an elevated sense of education and development and even launched a political movement to have a separate Bodo state. They have partially succeeded in securing a Bodo District Autonomous Council that covers Kokrajhar district and some adjacent area. The Bodos have a tradition of oral literature, which is committed to writing through a modified Assamese script. In pursuance of their literary ambitions, they have also promoted 'Boro Sahitya Sabha', a literary forum of Bodos.

The Bodos have adopted many of the rituals of the Hindus like cremating the dead besides the usual practice of burial. Residence after marriage is patrilocal. A patrilineal society, they follow the practice of primogeniture in matter of succession. Bride price as a practice persists. They practise settled farming and own property individually as well as a share in community ownership. A level of literacy of 52 % among does not compare well with the overall literacy rate of 64 % for Assam (2001) as a whole, though this compares favourably with the mean literacy rate for the Scheduled Tribes of the state.

Bodos, the earliest settlers of Assam seeking recognition of their legitimate aspirations to nurture and develop their own culture, literature and economy, are in a state of turmoil. The Bodo movement for a separate Bodo state, Bodoland, to be carved out of Assam is beset with many difficulties including the forbidding disposition of the Bodos themselves. The Bodo movement has often turned violent in the past. The demand for a separate Bodoland has ended in their getting a Bodoland Territorial District Council that gives them symbolic right on the local resources and makes some budgetary provision for the development of the district. Similar

councils exist in some of the districts of Assam like Karbi-Anglong and North Cachar Hills (now Dima Hasao). But unlike the Karbi-Anglong and North Cachar Hills districts, the tribes in Kokrajhar form only one-third of the population and the Bodos only 31.7 %. In the light of the share of Bodo population in the total population of the district, their demand for a separate state is not tenable. 'Since 1966, the Bodos have struggled for a separate political identity. Starting off modestly, they now demand the creation of a separate state on the north bank of Brahmaputra as well the autonomous districts for their Rabha and Tiwa cousins' (Nayak and Patra 2003). What is most unsavoury is a campaign of the Bodos to drive out the non-Bodos from the proposed Bodoland area, a kind of ethnic cleansing that is an outright violation of human rights. To attain a state of Bodoland by driving out all the non-Bodos, like the Santhals and Bengalis, from the area may defeat the purpose for which violence is adopted as a legitimate means.

The second difficulty that the Bodos experience, and a genuine one, is the incursion of non-Bodos or even nontribal people in their territory that is under the general development administration of the Bodo Territorial Council. It has to be emphasised that the largest concentration of the Bodos is in Kokrajhar, the westernmost district of Assam, lying between Bhutan Himalayas in the north and Dhubri district in the south; the latter district has a Bangladesh border with a density of 1,171 persons/km^2 in stark contrast with Kokrajhar with a density of 280 persons per km^2. Added to this is the alarming growth of 24.4 % in the population of the district. This steep population density gradient is a natural inducement to the people of Dhubri district to migrate to less densely peopled Kokrajhar where the Bodos are settled and who resist immigration from the neighbouring district. An abnormal growth of 24 % in the population of Dhubri is believed to be the result of illegal migration from Bangladesh that is easily absorbed by the co-religionists of Dhubri who constitute 75 % of the population of the district. Thus, midway between Brahmaputra and Bhutan Himalayas, a distance of roughly 75 km is a zone of conflict where Muslims pushing northward and the Bodos defending their turf often clash. As late as in July 2012, there were serious clashes, which claimed 75 lives and over half a million people was rendered homeless. In such a situation how the Bodos will realise their dream is a question that needs a parliament solution.

11.10.1.2 The Rabhas

A tribal group related linguistically to Boro/Kachari has a population of 277,517 (2001), of which 45 % are in Goalpara district of Assam that forms the core area of Rabhas. From Goalpara, they have radiated in Meghalaya in the south, particularly the Garo Hills area, and Kamrup, Darrang, Kokrajhar and other districts in western Brahmaputra valley. About 80 % of Rabha population is concentrated in Goalpara, Kamrup and Kokrajhar districts and another 16 % in Garo Hills, with some settled groups in Nalbari and Bongaigaon. There is no trace of Rabhas east of Kamrup, and north of Brahmaputra, they disappear beyond Sonitpur district. One might

say that the Rabhas represent a transitional group between Garos in the south and Bodos in the north.

The Rabhas practise settled cultivation, but those on the margin of Meghalaya plateau, on the northern fringe of Garo Hills, still practise shifting cultivation, which is declining in intensity. Most Rabhas are Hindus and worship Kali and Kamakhya. Literacy in the group, at 55–60 %, is above the average for Scheduled Tribes in Assam, which stands at 52 %. Two-thirds of the Rabhas are bilingual and speak Assamese, besides their own language 'Rabha', and use Assamese script for writing. The Rabhas have been considerably influenced by the Garos and adopted a matrilineal system, but for the matter of inheritance which is based on male equigeniture. A large number of Rabhas live in Brahmaputra plain, south of Goalpara and the northern fringe of East Garo Hills district of Meghalaya. In this habitat they own fertile land and practise wet cultivation in the plain and rain-fed cultivation in the foot zone of Garo Hills, growing principally paddy, mustard, pulses as food and sugarcane, and jute as a cash crop. Fishing is a supplementary occupation.

11.10.1.3 Kachari-Sonowal

With a population of 235,881 in 2001, this group of Kacharis, also called *Sadiyal*, because of their long association with Sadiya, the capital of Chutia kings. The Sonowal Kacharis were traditional gold washers, filtering gold from the alluvial sands of Subansiri, Brahmaputra and Burhi Dihing rivers. During Ahom period, the washers had to pay one tola (10 g) of gold per head per year (Dutt and Dutta 1976:219–220). Though Sonowals are scattered all over Eastern Assam, they are highly concentrated in Dibrugarh district. With a high literacy rate in the community (70.5 %), they have taken up a variety of trades and even white-collar jobs and are virtually assimilated in the Assamese society. Most Sonowals speak Assamese as their mother tongue, have completely ignored their traditional 'Bodo' language and have adopted surnames like Vora, Saikia, Hazarika and Barua. Deeply influenced by Vaishnavism of Sankardeb, they belong to the Mahapurusia sect believing only in 'kirtan' and keeping away from Brahmanical rituals. Almost all the Sonowals are Hindus and observe *Bihu* and other Hindu festivals. Divided into several territorial *khel* groups and clans, they are clan exogamous and allow widow marriages. Patrilineal in the matter of succession and patrilocal in family organisation, they have both nuclear as well as joint families. They are agriculturists, besides practising sericulture and weaving. The Sonowals have a very rational approach to modernity, taking education, believing in modern medicine and adopting modern technology for weaving. Many of them have entered politics.

11.10.1.4 Lalung/Tiwa

A Kachari tribe, numerically significant and next to Kachari-Sonowal, the Lalungs, have a population of 170,622 (2001) and are confined largely to Marigaon and

Karbi-Anglong districts of Assam. Lalungs are also known as *Tiwas* and are grouped into Hill Lalungs and Plain Lalungs, the former spread over in Amri and Howraghat Community Development Blocks of Karbi-Anglong district and the latter settled in Marigaon district. These two districts together have 85 % of the total Lalung population of the state. Most of the Lalungs are Hindus and the God 'Mahadev' is their principal deity, though a few Hill Lalungs have adopted Christianity as their faith. With several clans in the community, each clan has its own *Barghar* (the prayer hall) with Mahadev as the presiding deity. The community observes most of the Hindu festivals including 'Bohag Bihu' in April and 'Magh Bihu' in January. Lalungs are usually patrilineal in the plains, i.e. Marigaon, and matrilineal in the hills of Karbi-Anglong. They are monogamous; child marriages are unknown and widow marriage is allowed. Like the Hindus, Lalungs cremate their dead. The community has not moved to cities and literacy level is low. They are essentially agriculturists and rear pigs and fowl as supplementary occupation. Rice is their staple food, and as nonvegetarians, they abstain from eating beef. They are fond of *chu* the country liquor prepared from rice.

11.10.1.5 Dimasa Kacharis

Unlike in Brahmaputra valley, the Kacharis call themselves 'Dimasa' in North Cachar Hills and Karbi-Anglong. The word *Dimasa* is a corruption of *Dima fisa* or sons of the great river (Gait 1906:242). The Dimasas were known to the Ahoms as 'Timasa', clearly a corruption of Dimasa. The title was in vogue even when the Kacharis were ruling in Dimapur. A remarkable resemblance between Dimapur and Dimasas explains the association of the latter with the Kachari rulers of Dimapur. Following their defeat at the hands of Ahoms, the Kacharis fled Dimapur and retreated southward establishing their capital at Maibong, a place on the river Mahur. It is likely that the Dimasas migrated with their masters, and as the Kachari kings migrated further south, under the pressure of the Ahoms, and settled in the Trans-Barail region of Cachar with their capital at Khaspur, the mass of Dimasas remained put where they had settled earlier. Today the Dimasas are largely concentrated in the northern part of North Cachar Hills, spilling further north into Karbi-Anglong district. The community had a population of 116,976 in 2001 of which 56 % was in North Cachar Hills (Dima Hasao) district, 40 % in Karbi-Anglong district and the remaining 4 % scattered elsewhere. In North Cachar Hills, the Dimasas form over one-third of the total population of the district and half of the district's tribal population. They share the territory with other tribal communities like the Hmars, Kukis, Nagas and Mikirs. Thus, the predominantly tribal population of North Cachar Hills is a melange of several tribes as well as nontribes, many of whom speak more than one language, reflecting the locational character of the region that shares its borders with Nagaland, Manipur and Meghalaya. Dimasas live in thatched houses built of bamboo and timber, on earthen plinth. The walls are made of split bamboo or bamboo mat with mud plasters. The houses are divided into several parts, each part

reserved for a specific purpose. The outer part of the house, locally known as *nokhong*, is a multipurpose segment meant for dining, sitting and sleeping and the inner part known as *noring* is used as kitchen and dormitory for unmarried girls (Dutt 1979). The community builds its houses on slopes with some water source close by. Usually organised in two rows facing each other with a central street, the villages have an entrance. Every village has a dormitory called *nodrang*. Each village is governed by a council of three members headed by *khunang*, who is the hereditary head of the clan. The hereditary chiefship is abolished by law but exists only as a tradition.

Most Dimasas are Hindus, though they follow their traditional belief. They believe in the existence of one supreme being called 'Madai'. Madais are also spirits. A 'Daikho', which literally means a temple, has a presiding deity with a specific territorial jurisdiction and a group of followers. The community has 12 Daikhos, and a Dimasa must owe allegiance to one of them. Dimasa society comprises 40 male clans, called *sengphos* and 42 female clans called *jaddis*. Both these clans are exogamous. There is no practice of child marriage. Dimasas are strictly monogamous, widow marriages are permitted and divorce is rare. The Dimasas, it is believed, adopted Hinduism with the conversion to Hinduism of their king Raja Krishna Chandra in 1790. Added to that was the influence of the fast-spreading Vaishnavism propagated by Shri Shankar Deb. Today, over three-fourths of the Dimasas follow Hinduism, a small number follows Christianity and some exclusively retain their traditional belief.

Both patrilineal and matrilineal systems of descent exist among the Dimasas. A man primarily reckons his descent from his paternal grandfather and concurrently from maternal grandmother. A woman primarily reckons her descent through her maternal grandmother and paternal grandfather (Danda and Danda 2004). Thus, a Dimasa always bears allegiance to two clans. In matters of succession, all sons share the father's property equally and daughters inherit the mother's property. They use their clan name or Barman as a surname.

The Dimasas are still largely *jhumias* and depend on 'slash and burn' type of cultivation. Rice is the staple food and 'beef' is excluded from the diet of the community. Pork is a delicacy and milk is denied in the orthodox section of the society. A spirit of cooperation, typical in tribal clans, is clearly witnessed in the institution of *hangsao*, which is a well-knit team of able-bodied adults formed annually to work in the jhum fields. The festivals of the community are associated with agricultural practices, the most important being the *Rajni Gabra* before sowing, and *bishu* a harvest festival that coincides with the *Bihu* of Assam and lasts for a week. As a community, Dimasas are more or less static and have not ventured into neighbouring territories beyond North Cachar Hills and Karbi-Anglong districts. On the contrary, Nagas from Nagaland, Kukis from Manipur and Hmars from Mizoram have gradually immigrated into North Cachar Hills and have built their strength. These immigrant communities sometimes even disrupt the social cohesion of the area. The 30 % ontribal population of North Cachar Hills district comprises the Bengalis, Assamese, Marwaris and Nepalis, and Dimasa villages are often

surrounded by these communities. Because of proximity and close association with different linguistic groups, Dimasas are able to communicate in a number of languages.

11.10.1.6 The Deoris

The Deoris were once the priestly class associated with the Chutias who ruled the area now occupied by Dhemaji district, with their capital at Kundil, near Sadiya. The Chutias were defeated by the Ahoms in the beginning of the sixteenth century. The population of Chutias merged with other Hindu groups, but their priestly class, the Deoris, remained stuck with their traditional lifestyle, preserving the Chutia language that has some resemblance with the Bodo language of Indo-Tibetan family. The Deoris, numbering 41,161 in 2001, are spread in the eastern part of the state with their highest concentration in Lakhimpur and Dhemaji with some sprinkling in Tinsukia, Dibrugarh, Sibsagar and Jorhat.

The community moved from east of Sadiya to Lakhimpur in the beginning of the nineteenth century and then spread to Majuli island and other parts of Jorhat and adjacent districts. Deoris are, by religion, Hindus but keep fowl and pigs. Largely rural, the Deoris depend on agriculture for their being. Though Hindus, they have retained their traditional deity, 'Gera Gerachi'. Living in joint families, they are monogamous and follow a patrilineal system where property is inherited equally among the sons. Their mother tongue is 'Deori', and they use Assamese script for writing. Despite poverty, literacy rate among the Deoris is over 70 %.

11.10.1.7 Other Tribal Groups, the Offshoots of the Bodo–Kachari Fold

Besides the tribal groups mentioned above, there are several smaller groups with their parentage linked to the larger Bodo–Kachari groups. These are Mech, Hojai and Barmans. While the Mech with a population of 8,997 (2001) are distributed on the two sides of Brahmaputra in Lakhimpur and Sibsagar district, the Hojai with a small population of 1,882 (2001) are found in Nagaon and Darrang districts. The Barmans, on the other hand, are located in Cachar district. There is a general speculation that Barmans, once a part of Dimasa group, are completely transformed after having settled in Barak plain. They have adopted a sedentary way of settled cultivation and are greatly changed under the influence of Bengali culture.

11.10.1.8 The Boro-Kacharis

The compound term Boro-Kachari often creates confusion. As a clarification, it may be mentioned that according to 'The Scheduled Castes and Scheduled Tribes Order (Amendment Act) 1976', 'Boro, Boro-Kachari' is referred to as single tribe in Assam.

The same term 'Boro, Boro-Kachari' is repeated in the Indian Census of 2001 for Assam under the heading 'State Primary Census Abstract for Individual Scheduled Tribe – 2001'. In the district-wise tabulated list of individual tribes and their numerical strength in each district, one finds two terms 'Boro etc.' and 'Kachari etc.'[21] in each district and the numerical strength clearly recorded separately, thus giving the impression that Boro and Kachari are two distinct tribes. There is, however, no doubt that Kacharis and Boros represent one and the same tribe and have adopted different names in different areas as suggested by Gait (1906:236). According to him, 'Kacharis may be described as the aborigines, or earliest known inhabitants of the Brahmaputra valley. They are identical with the people called Mech in Goalpara and North Bengal. These are names given to them by outsiders. In Brahmaputra valley the Kacharis call themselves Bodo and Bodo fisa (Sons of Bodo). In the North Cachar Hills, they call themselves Dimasa, a corruption of Dima fisa or 'sons of Great River'. They were known to the Ahoms as Timisa, clearly a corruption of Dimasa, as this name must have been in use when they were still in the Dhansiri valley'.

What appears more logical is a matter of emphasis and usage. Though linguistically and in many other aspects the two groups have inherited the usage from their community chief, in most districts, the population recorded as that of 'Boro etc.' far exceeds the strength of 'Kachari etc.' particularly in the districts north of Brahmaputra. There are nonetheless a few districts like Lakhimpur, Tinsukia, Dibrugarh, Sibsagar and Jorhat where the population of 'Kachari etc.' far exceeds the population of 'Boro etc.' As a general rule, the tribe known as Kacharis is more numerous in the eastern districts of Assam, usually in the districts south of Brahmaputra, while the same tribe known as Boros is concentrated in the western half of the state, particularly the districts lying north of Brahmaputra.

11.10.1.9 Kacharis

The distribution of Kacharis in the eastern part of the state conforms with the historical facts. But first the distribution itself (Table 11.25):

In each of the four districts, viz. Tinsukia, Dibrugarh, Sibsagar and Jorhat, the Kacharis outnumber the Boros, with their highest concentration in Dibrugarh. The reason for this is not far to seek. As seen earlier while discussing Dimasa Kacharis, the Kacharis ruled for a few hundred years over the eastern part of Assam from their capital in Dimapur. 'In the 13th century, it would seem that the Kacharis kingdom extended along the southern bank of the Brahmaputra from the Dikhu (river) to Kalang (river) or beyond and included also the valley of Dhanseri and the tract which now forms the North-Cachar subdivision' (Gait 1906). There is no doubt that the Kacharis clustered around the royal seat at Dimapur and the Brahmaputra plain, enjoying the protection of the kings. And despite the arrival of

[21] The terms 'Boro etc.' and 'Kachari etc.' are introduced by the census giving district-wise population of individual tribe.

Table 11.25 District-wise distribution of Kacharis and Boros in Assam (2001)

District	Population in 2001		Location
	Kachari etc.	Boro etc.	
1. Sonitpur	1,907	140,293	North of Brahmaputra
2. Lakhimpur	19,542	8,194	"
3. Dhemaji	23,720	42,991	"
4. Tinsukia	36,460	1,939	South of Brahmaputra
5. Dibrugarh	67,311	3,529	"
6. Sibsagar	8,072	3,136	"
7. Jorhat	20,784	4,787	"
8. Golaghat	15,844	26,106	"

Source: Census of India, District wise Population of Tribes – 2001

the Ahoms and the overthrow of the Kachari kingdom, the Kachari population continued, transferring their loyalty to the new rulers and benefitting from the protection of the Ahom kings.

11.10.2 Immigrant Tribal Groups

Besides the Bodo–Kachari group, which forms the substratum of the entire humanity of Assam, there are other tribal groups whose core habitat is in one of the border states, and they have moved into Assam, especially in North Cachar Hills and Karbi-Anglong district in not too distant a past. The Hmars and Kukis, for instance, have entered and settled in North Cachar Hills. Similarly, Nagas have entered Karbi-Anglong from Kohima and Dimapur districts of Nagaland, which have a common border with Karbi-Anglong district.

11.10.2.1 The Miris (Mishings)

Another significant group only next to the Bodo–Kachari group of tribes is composed of the Miris, who, besides being culturally very progressive, are numerically the second largest tribal group in Assam. They are the principal tribal group of Eastern Assam occupying both the northern and southern bank of Brahmaputra and extending into several districts of Arunachal Pradesh. Once occupying the territory common with that of Abors, the Miris migrated gradually towards Brahmaputra plain under pressure from other hostile groups, particularly Abors. Even today, a residual population of a few thousand Miris is found in Dibang valley and Lohit district. The district-wise distribution of Miris in Assam is as follows (Table 11.26).

More than three-fourths of the Miri population is clustered in the three districts of Assam, viz. Dhemaji, Lakhimpur and Jorhat, with a very high concentration in Dhemaji, forming a third of the total population of the district. In their movement to

Table 11.26 District-wise distribution of Miris in Assam

Districts	Population in 2001
Assam (all districts)	**587,310**
1. Sonitpur	44,092
2. Lakhimpur	165,843
3. Dhemaji	185,906
4. Tinsukia	17,203
5. Dibrugarh	9,332
6. Sibsagar	23,849
7. Jorhat	92,058
8. Golaghat	47,539
Other districts	1,488

Source: Census of India, District wise Population of Tribes – 2001

the south, Lakhimpur and Dhemaji are the districts first encountered on the northern bank of Brahmaputra, the area considered the core habitat of the Miri community. The more adventurous among them crossed over to the southern bank of Brahmaputra into Jorhat and Golaghat districts with some moving eastward into Sibsagar, Dibrugarh and Tinsukia. Thus, the Miris are spread in a compact block of five to six districts. The community is conspicuously absent in the western districts of Assam. Sonitpur on the northern bank and Golaghat on the southern bank of Brahmaputra form the western limit of Miri diffusion from their core area of Lakhimpur, Dhemaji and Jorhat. There are not many Miris left in Arunachal Pradesh. Their number was 13,591 in 2001, with half of them in Lohit and a quarter in Dibang valley and East Siang districts. In some places, they are referred to as Hill Miris, but the prefix 'Hill' is now considered redundant.

Dalton (1872:29) wrote that 'The Miris of the plains are offshoots from the Abors, … but there are various clans of them differing in external appearance and some of these clans have settled in Assam for ages. They, however, keep much to themselves, leading rather a nomadic life living in houses on stilts built on the precarious banks of Brahmaputra and its estuaries or affluents, and cultivating the alluvial flats of the river. With the exception of the clan of Chutia Miris, the traditions of all of them take them back to the valley of Dihong (Dibong). It is probable that they advanced from the north, made settlements in the country now occupied by the Abors, and the latter people, of the same race but more powerful following their footsteps pushed them on into the plain'. Though the Miris are known to have occasionally invaded border villages of Ahom territory as it happened in 1685, when they 'invaded border villages by night and set fire to the house of Sadiya Khowa Gohaim' (Gait 1906:158), by and large, the Miris were considered nonaggressive.

A people of Tibetan stock, the Miris acted as intermediaries between the people of the hills and the plain and worked as a channel of communication between the Abors living in Sadiya Frontier Tract and the plains people of Assam, monopolising much of the trade. The name 'Miri', meaning 'go-between' has been derived from their role as intermediaries in the trade between the hill communities and the people of the plain.

Photo 11.7 Mishing (Miri) children on Majuli Island in Brahmaputra, Jorhat district, Eastern Assam

Almost the entire Miri community has adopted Hinduism and follows the rituals and festivals followed by the Hindus in Assam. They eat lamb, fowl and pork but are not known to eat beef. They have usually given up their ancestral language, the 'Mishing', and only a microscopic section still speaks that language. They have adopted Assamese as their mother tongue and use Assamese and Devanagari script (Singh 1994). Literacy among the Miris is around 50 %, with 60 % among the males. Hardly 2 % of the community lives in urban centres. A large section of the population depends on cultivation and fishing for their living. The Miri women are good at weaving, particularly those living in Arunachal Pradesh. Despite a moderate level of literacy among the Miris, the community has produced some accomplished intellectuals and is fast catching up with the rest of the country (Photo 11.7).

The traditional village administration still exists, and *Gaon Bura*, who administers the village, is still respected. The Miris have been expanding their social horizon by promoting contact with the Assamese, Bengalis and Biharis of the plains. Many of them still believe in the existence of spirits, living in mountains, streams, forests, moon and sun, who have to be propitiated by sacrificing fowl, pigs and offering liquor. The system of bride price exists. The community is extremely fond of dance and observes festivals like the Assamese *Bihu* with great fanfare. The Miri villages are usually small consisting of a few huts on stilts with walls of split bamboos and sloping thatched roofs. The chief's house is usually large and sometimes as much as 20 m long and 5 m wide, divided into compartments with a passage on one side running the entire length of the house. In large houses, there are several hearths each belonging to one family.

Originally, the Miris formed different groups like the Hill Miris and Plain Miris, and among the former, there were groups like Ghai-Ghasi Miris, Panibotia Miris and Tarabatia Miris (Dalton 1872:30). The hill Miris numbering 13,591 in 2001 are confined to Lohit and Dibang valley districts of Arunachal Pradesh. The Miris in Assam are plain Miris. Despite the community's assimilation in the Assamese society, it lags behind in socio-economic sphere. The community has its own literary and social organisation that undertakes programmes aimed at development of the Miri society.

11.10.2.2 Karbis/Mikirs

An important scheduled tribe in Assam, numerically the third largest after Bodo–Kachari and Miris, is the community of Mikirs. 'The origin of the word 'Mikir' which was used to address the 'Karbis' is still shrouded in mystery. Perhaps, it is the name given by the Assamese. The Mikirs call themselves 'Arleng' meaning 'Man', or Karbi. An important question about the Karbis is whether they belong to the larger Bodo–Kachari group. Linguistically, they occupy a transitional position, classified as the 'Naga-Bodo subgroup' by Grierson (1903:379), by which he implies the language between the Angamis on the east and the Bodos on the west. In this group he puts four languages, Mikir, Kachcha Naga, Kabui and Khoirao. Singh (1994:466) thinks that the language is part of a Bodo group of Tibeto-Burman family, though they are not included in the Bodo–Kachari group of tribes. According to Stack (1908 quoted by Charles Lyall (1908), the Karbis 'claim kinship with no other tribe in Assam and are, in fact, difficult to group with other branches of great Tibeto-Burman stock, to which undoubtedly they belong'. The leading feature of the race (Mikirs) as described by Stack, in contrast with other hill tribes of Assam, is essentially their unwarlike and pacific character, the reason why they were described as good subjects.

The Karbis are largely concentrated in Karbi-Anglong district of Assam that was known earlier as Mikir Hills, with some spill-over in the neighbouring district of North Cachar Hills. The strength of the community in Assam and its distribution are given below.

Total population of Karbis in Assam (2001)	353,513	100.00 %
In Karbi-Anglong district	345,540	97.75 %
In North Cachar Hills	7,973	2.25 %

Social Interaction of Karbis with Other Groups

Karbi-Anglong is the largest district of Assam with an area of 10,434 km^2, and a population of 813,311, showing the second lowest population density of 78 persons/km^2, the lowest being North Cachar Hills with a population density of 38 persons/km^2. The Karbis form only 42.5 % of the total population of the district, though they

account for 75 % of the district's scheduled tribe population. About 45 % of the population of the district is nontribal, and more than a 100,000 of tribal population is distributed among the non-Karbis, like Dimasas, Garos, Khasis, Kukis, Nagas and Chakmas. Thus, the Karbis like the Miris are constrained to live in a social environment where they have to interact with several other tribal and nontribal Hindu groups speaking Assamese, Bengali, Hindi and Nepali. This explains why most Karbis are bilingual and have not only adopted Hinduism but also many of the belief systems and the rituals. They also intermarry in other communities like with Lalung, Biharis and Nepalis.

The Karbis are divided into three broad social groups:

1. Chintong
2. Ronghang
3. Amri

There is no definite hierarchy, but for long, the Amris were considered laggards by the other two groups and were not given a status equal to them, especially in the Dhansiri valley. In Kopili valley, in the western part of their habitat, the Amris were treated equal to the other two groups. A third group consisting those who moved to the plains and took to plough cultivation, named 'Dumrali' was later added on to the community. The Karbis have clans called '*Kurs*', the term used by the Khasis and adopted by the Karbis with one major difference. The Karbis don't have matrilineal clans or institutions like the Khasis. They have a patriarchal system. They have four generally recognised '*Kurs*'.

1. Ingti – A priestly class like the Gosains.
2. Terang – A *Kur* claiming same function and importance as the 'Ingtis' but considered much lower in hierarchy.
3. Lekthe – This clan is believed to have been a military clan.
4. Timung – The rest of the community.

The institution of *Kurs* is, however, not so strong, and today all the *Kurs* stand on equal footing. All these clans are exogamous. Under the patrilineal system, the children assume the title or surname of their father. All the sons inherit the property of the father, the eldest son getting a little more than his share. The wife and the daughter do not get any share in the property. If the deceased has no son, the property passes to his brothers. Karbis are monogamous and polyandry is not known. Marriage with maternal uncle's daughter is preferred. The Karbis cremate their dead and observe elaborate ceremonies in the interest of the dead spirit.

Greatly influenced by Assamese Hindus, Karbis have adopted many of the beliefs of the Hindu community. Despite the fact that they believe in an almighty God called '*Arnam Kethe*', they also believe in lower-order gods whom they propitiate by offerings. They have borrowed the notion of '*Baikhuntho*' (Vishnu's paradise) and *Norok* (Narak or hell) from the Hindus, and the concept of Yamraj, the god of death among the Hindus, known to them as '*Jom Recho*', carries conviction with them, as they believe that he is the lord of spirits with whom the dead remain below the ground. They have no idols, temples or any other kind of shrine, and gods

like '*Peng*' and '*Arnam-atum*' are worshipped in different ways. By way of festival, the Karbis celebrate an annual compulsory village festival known as '*Rongker*', usually held at the beginning of the agricultural calendar, i.e. June, but in some villages also during winter.

Largely agriculturists, the Karbis practise shifting, as well as wet cultivation, and produce rice, their staple food, besides growing millet, maize, cotton, sesame, ginger, chillies and mustard. In the fields under shifting cultivation, vegetables such as cucumber, pumpkin, bitter gourd and watermelon are also grown. Like the plains people, Karbi also grow *Ahu* and *Sali* paddy, the former is harvested in August–September, and the latter in November–December. In recent years horticulture, particularly the growing of banana, pineapple and oranges, is adopted by the community.

Karbis live in small villages named after *Gaonburas* and located at hilltops in clearings made by the community. Earlier, the villages often shifted locations with change in the site of *jhums*, but this trend is virtually stopped and the villages have become permanent settlements. The houses are built on stilts a metre above the ground using split bamboo for walls and floor and thatch for roofs. The house is vertically divided into parts called '*arpongs*', a section with a fire place for the guests, and the larger rectangular part called '*kut*' is for a single family. Occasionally, married sons also live in the parental house.

The village has been traditionally administered by a village council presided over by 'Gaonbura', locally known as '*Sarthey*'. This council settles minor disputes. There is also a great council (*mi-pi*) where only *Gaonburas* are members and which is presided over by the 'Mauzadar'. This council settles more serious issues. With modern Panchayats being introduced, the traditional authority of the Gaonbura is partially eroded, yet it will be long before a democratic set-up of governance is established in the villages.

Karbi-Anglong as a district has witnessed large-scale immigration of Nepali- and Hindi-speaking people, besides the Assamese. All of them came to this low-density district, to engage in some kind of forestry-related work, agriculture, public work, transport and dairying, the last one a favoured profession of Nepalis. The result is a kind of miscegeny that has affected the Karbi population. They are, in fact, losing their identity. Most of them have adopted Assamese as their principal language of communication and speak Assamese quite fluently. The changes are also brought about by the development work initiated by the government.

11.10.3 The Assamese People and Society

The Assamese society, as one finds today, is not a monolithic ethnic or linguistic unit. It has a complex structure in which people of different ethnic stocks, practising varying faiths and having different cultural traditions are welded together and spatially linked to form a mass of humanity recognised as Assamese. The people of Assam have a history that is marked by immigration of people at different periods.

The Assamese society is formed by layers of humanity, arriving in hordes, or trickling in, in small numbers, from the prehistoric times to the contemporary era of post-independence India. The Neolithic people who left behind archaeological remains in some parts of Assam; the Bodos, believably the earliest immigrants to Brahmaputra valley who spread like an oil sheet over the entire area of Assam plain and ruled in different parts of this region; the Indo-Aryan ruling dynasties, which flourished in Kamarupa during the early centuries of Christian era; and finally the Tai-Ahoms who arrived in Brahmaputra valley in the early thirteenth century and ruled over the entire valley for over 600 years all represent not only phases of Assam's history but also layers of humanity, each with its own culture and philosophy, symbiotically linked and compacted into what is the Assamese society today. A period of about 1,500 years of Assam's history starting from the seventh century is marked by appearance on the scene of ruling dynasties, consolidation of empires, disruptions and disintegration, and reappearance of new rulers. There have been interruptions caused by invasions from the neighbouring rulers, particularly from Bengal, though these invaders did not establish a permanent foothold in Assam and only left behind traces of their invasion and occupation in the landscape of the region.

11.10.3.1 Ethnic Composition of the People of Assam

There are three principal racial groups in the population of Assam:

1. The Mongoloids
2. The Indo-Aryans
3. The Dravidians

The Mongoloids

'All tribes of North-East India are basically Mongoloids. Some groups remained confined to certain small geographical areas while others were distributed over larger regions' (Das 2008:3). This group is represented by a number of tribal groups led by the Bodos and other associated tribes like Dimasas, Kacharis, Rabhas, Lalungs, Sonowal Kacharis, Mech and Rajbanshis. Besides, Miris of Eastern Assam and the Ahoms and Morans of Shai-Tai origin all fall in the Mongoloid category: All these tribal groups are already described in the foregoing pages. It is important to add that besides the tribes, there is a large group of people who are Mongoloid but integrated in the society and cannot be easily distinguished. These peoples have adopted the practices of other religions and are fully integrated in Hindu or Muslim society, taking on the titles and surnames that suggest a nontribal origin. But in reality, a large fraction of nontribal population has Mongoloid roots.

The Indo-Aryans

These are the descendents of early migrants from the Gangetic valley. The early ruling dynasties of Assam, then known as Kamarupa, viz. the Varmans, the Salastambhas and the Palas, occupying a period of 600 years, from sixth to twelfth century A.D., in the history of Assam, were the followers and promoters of what is called *Aryadharma.* According to B. K. Barua (1951) *Aryadharma* based on immemorial customs was the principal religion of Kamarupa. In Nidhanpur grant of seventh century, it is clearly stated that king Bhaskarvarman revealed the light of Aryadharma by dispelling the accumulated darkness of Kali age (Barua 1951:46). Barua supports his contention by referring to Aswamedh sacrifices performed by Mahendravarman and quoting sanskritised names like that of caste (*tanti*), a river *Mangaldai*, a floral species like *Palasbari* and even a hill like *Haruppeswara*. The rulers of these dynasties encouraged the migration from the Ganga valley to Kamarupa. One of the kings, named Bhutivarman (sixth century A.D.), according to Nidhanpur copper plate, granted special *agrahara* settlements to more than 200 Brahmin families of various *gotras* and *ved sakhas* for promotion of Vedic religion and culture. The speakers of Indo-Aryan languages migrated to Assam from *Madhyadesa* and a succession of influences, ideas and cultures entered Assam with them. The Brahmans and Kayasthas came to Assam from Videha (North Bihar) and Kanauj. In the following centuries, more and more people from the Indo-Aryan fold entered Assam, multiplied and spread their own culture through literature, religious practices and shrines erected all over the state. A prolonged miscegenation involving the immigrant Indo-Aryan folks and the local population led to an increase in the Hindu fold. Thus, for long, Assam had only two religious groups, the Hindus practising their ritualistic belief, propagating Sanskrit learning among the Brahmins, erecting temples of Siva and Vishnu and in the process creating a socioreligious landscape that saw the emergence of Assamese as an independent Indo-Aryan language and the animists represented by the native tribal population who had their own belief system. With successive centuries, more and more animists were absorbed into the Hindu fold either by intermarriage or by conversion to Hindu faith. The dominance of Hinduism was disturbed only in the beginning of the thirteenth century with the invasion of Muslim rulers of Bengal who had established their rule there and were trying to expand their kingdom into Assam. Thus, Islam was introduced in Assam in the thirteenth century. The spread of Hinduism was nonetheless accelerated after the arrival on the scene of Sankardeb, religious leader and social reformer of the fifteenth century, who not only propagated Vaishnavism, an important sect of Hinduism but laid a solid foundation for perpetuating Hinduism through the creation of an institutional framework under which every village of Assam has a '*namghar*', a prayer hall devoted to prayers and divine chants, all over Assam. Gradually, Hinduism crossed the racial divide and absorbed in its fold people from other racial stocks, principally the Mongoloids. This led to an increase in the number of Hindus making Hinduism the dominant religion of the state.

The other strand of Indo-Aryan stream consists of the immigrant Muslims of Bengal. The Muslim population of Assam, which also descends from the Indo-Aryan

stock, is the result of immigration during the last 500–600 years. In an earlier period, many Muslims came to Assam with the invading armies, either as foot soldiers or as part of the support troops, and stayed back, particularly if they had to accompany their defeated generals. Starting from the early thirteenth century till the late seventeenth century, culminating with the battle of Saraighat (1671 A.D.) in which the Moghul forces were routed by the Ahoms, there were many intermittent Muslim invasions. Though these invaders could not retain their foothold for a sustained period and were either forced to retreat or perished, they left behind many individuals who practised Islam as their faith. Some were captured soldiers, while others stayed behind by choice. A large-scale influx of Muslims into Assam, however, took place in the twentieth century, after the arrival of the British who guaranteed freedom of movement in their empire. Once the restrictions were done away with, the Muslim farmers from Bengal began to move into Assam and colonise new land and reclaim uncultivated area for agriculture. This movement was a migration from an area of high population density to an area of low population density. It was unlike the rural–urban migration stream, where the population shifts from agriculture to nonagricultural occupation. In the case of Bengal–Assam migration, it was a movement from a high-density *zamindari*-dominated agricultural area to a low-density agricultural area with a *ryotwari* system in which the intermediaries like the zamindars did not exist. Initially encouraged and even promoted periodically, this incessant stream of migration of Muslim peasants from Bengal, especially the neighbouring districts of Mymensingh, continued unabated except for a very short lull during the period of India's partition. Soon thereafter, illegal migration from East Pakistan started, which has not stopped to this date. The strength of Muslims in Assam is the cumulative effect of years of immigration and their multiplication and diffusion.

Despite the spread of Hinduism and Islam, both of which arrived from the Gangetic plain or delta, the racial character of the state is not completely transformed. It is quite likely that the Indo-Aryans may represent only a slice of the genetic make-up of the state. As Barkataki (1969) remarked, 'the strain of Aryan blood in Assam seems very *thin*'. The Indo-Aryan element in Assam is largely confined to the population of Hindus and Muslims who arrived in Brahmaputra valley at different periods of history.

The Austric Element

The Austric element is represented by a section of plantation workers. Many of the plantation workers were brought to Assam from Santhal Pargana in Bengal and parts of Central India. The Santhals and Mundas who arrived in Assam as tea plantation labour represent the Austric element in Assam. There are around 250,000 (242,886 – 2001) Santhali-speaking and around 100,000 (93,088 – 2001) Munda-speaking people in Assam. They don't appear in the list of Scheduled Tribes of the state, but they are settled in the state for over a century and are often in the news for wrong reasons, like the conflict with the Boros. About 80,000 Santhals are displaced following ethnic conflicts in the state.

Table 11.27 Relative strength of different religious communities over decades

Religious communities	Number of percentage of different religious communities (1931–2001)				
	1931	1951	1971	1991	2001
Hindus	3,739,252 (70.00)	5,732,517 (72.12)	10,604,618 (72.5)	15,047,293 (67.13)	17,296,455 (64.88)
Muslims	1,139,448 (21.35)	1,981,780 (24.93)	3,592,124 (24.56)	6,373,204 (28.43)	8,240,611 (30.91)
Christians	77,575 (1.45)	158,048 (1.99)	381,010 (2.6)	744,367 (3.32)	986,589 (3.7)
Others	379,016 (7.10)	76,109 (0.95)	47,400 (0.32)	249,458 (1.1)	131,873 (0.49)
Total population	5,335,331	7,948,454	14,625,152	22,414,322	26,655,528
Total %	99.98	99.99	99.98	99.99	99.98

Sources:
1. The figure for 1931, represent the population of different communities added together for Goalpara, Kamrup, Darrang, Nowgong, Sibsagar, Lakhimpur and Cachar. These were districts in 1931 that represent present-day Assam. There could be a minor discrepancy because of non-inclusion of four thanas of Sylhet district, which were added to India in 1947 and formed a part of Assam. Source, Census of India, 1931, vol. III, Assam, table XVI, Religion, pp. 256–262.
2. The figures for 1951 are calculated by adding the figures for Assam plain division (Cachar, Goalpara, Kamrup, Darrang, Nowgong, Sibsagar and Lakhimpur) and United Mikir North Cachar Hills district from the Assam Hill Division.
3. Source for figures for 1971, 1991, 2001 – Census of India 2001, Religion, Statements 2 and 2A-2G, pp. XXV–XXXII
4. Column others include Sikhs, Buddhists, Jains and others with religion not stated

The Dravidians

The *Dravidian* racial element in the state is represented by the Telegu-speaking people, though their number is relatively small. According to the 2001 census, there are 27,463 Telugu-speaking, 8,141 Malayalam-speaking and 672 Tamil-speaking people in the state.

11.10.3.2 Assamese People and Religion

Most Assamese people follow one religion or the other. The number of people who did not state their religion is just around 11 to 12,000; in the entire state that is 0.04 % of the entire population. Hinduism is the most common religion, followed roughly by two-thirds of the population.

While the Hindus are the largest group, Muslims form a significant minority. The followers of all other religions together add up to less than 5 % of the total population of the state. The relative strength of the three principal religions, viz. Hinduism, Islam and Christianity, while reflecting the sequence of their arrival, has varied over time (Table 11.27). The salient feature of this change is a progressive increase in the strength of Muslim community and a corresponding decline in the percentage of Hindu population. The trend is particularly striking during the last three decades, from 1971 to 2001.

Table 11.28 Growth rate of different communities between 1951 and 2001

		1951	1971	2001
Hindus	1. Population	5,732,517	10,604,618	17,296,455
	2. Growth ± %		+84.90 %	+63.1 %
Muslims	1. Population	1,981,780	3,592,124	8,240,611
	2. Growth ± %		+81.25 %	+129.4 %
Christians	1. Population	158,048	381,010	986,589
	2. Growth ± %		+141.07 %	+158.9 %

While between 1951 and 1971 the increase in the population of different communities has been relatively uniform, there is a sudden divergence in the growth rate as seen in Table 11.28.

While, in a 30 years period, the population of Hindus has grown by 63 %, the population of Muslims has more than doubled growing by 129 %, thus increasing the relative strength from 24.5 % in 1971 to 31 % in 2001. The Hindu population of the same period grew only 63 %, bringing their strength in the population from 72.5 % in 1971 to 64.8 % in 2001. The Christian population also witnessed an increase by 158 % and raising of their share in state's population from 2.6 % in 1971 to 3.7 in 2001. Much of the increase in the Muslim population has been in the districts bordering Bangladesh like Hailakandi, Karimganj, Dhubri, Goalpara, Barpeta and Nagaon – all in the western part of the state.

The uneven increase in the population of different communities marked by excessive increase in Muslim population during the last three to four decades is generally attributed to illegal yet uninterrupted immigration of Muslims from Bangladesh. In the initial stages, especially during the British rule, the immigrants were allowed and even their settlement was facilitated, but as their number grew and the competition for land increased, the Assamese felt threatened: the immigration that was a trickle before 1971 changed into a semi-permanent stream with immigrants entering the state in large number. The infiltration from Bangladesh has virtually stopped in recent years. Yet, the cumulative impact of past immigration has generated enough tension to create social disharmony.

The general distribution of communities, right from the beginning has been marked by a uniform spread of Hindus in all parts of the state, except the hilly tribal-dominated districts of North Cachar Hills and Karbi-Anglong, which are dominated by tribal communities. The Muslims have a higher concentration in the western districts and the Christians have a low presence in all parts of the state, but their number is slightly higher in Goalpara, Darrang, Sibsagar and Lakhimpur districts.

11.10.3.3 The Hindus in Assam

Hindus in Assam, as anywhere else in India, are a monogamous people who are not monotheistic and worship a pantheon of gods and goddesses. The multiplicity of gods and goddesses existed all through the history, starting from pre-Christian Vedic period down to the present day. Thus, in Assam, one can find temples of Indra, a Vedic god, to those of Sankara; Vishnu; goddess Kamakhya; and even various

incarnations of Vishnu, besides local deities, all representing a supreme god in different incarnations

As seen earlier, before the Muslims appeared on the scene in thirteenth century, the Assamese society consisted largely of Hindus and the pre-existing tribes who practised some kind of totemistic belief. Besides the Hindus, there were some Buddhists. The arrival of Muslims notwithstanding, the Hindu religion and, in turn, the Hindu society have undergone a prolonged period of evolution, during which the faith once greatly influenced by Buddhist '*Tantric*' tradition has adopted Vaishnavism, a sect of Hinduism that follows '*Bhakti*' tradition, implying complete surrender to God. This transformation of Hinduism was effected by Sankardeb, a fifteenth-century poet saint and his followers. The old ritualistic approach and animal sacrifices were done away with, and Sankardeb introduced a simple religion based on complete surrender to one God, a faith where worship consisted in '*kirtan*', singing hymns in praise of God. The religion, *Bhagbat dharma*, propagated by Sankardeb and his disciples, had greater appeal because of its simplicity, shorn as it was of all the elaborate rituals. Besides the followers of Vaishnavism, the most widespread sect of Hinduism in Assam, there are other sects like Saivism, which have their followers. Yet another sect that believes in the worship of 'Shakti', the goddess of energy, represented by Kamakhya Devi, including animal sacrifice, also attracts devotees.

The Hindu–Non-Hindu Relations

There were no religious conflicts in Assam, until the sixteenth century when some Hindu apostate tried to demolish Kamakhya temple at Guwahati. The most persistent reaction of the non-Hindu tribals has been to adopt Hinduism as a religion. The Bodos, the Koches, the Kacharis and even Ahoms adopted Hinduism without any coercion and joined the Hindu fold. The royal Ahoms even built temples devoted to Lord Siva and Vishnu. The temples and the priests were granted rent-free land for their upkeep. In the post-Independence period, however, there have been conflicts in which religious groups were involved. Communal disharmony developed only following large-scale illegal immigration from neighbouring East Pakistan, now Bangladesh. During the last six decades, it is not only the illegal immigration from the neighbouring country that has created tension in the society. Immigration from compatriots from other states has also caused unrest in Assamese society resulting in group-clashes.

The Structure of the Hindu Society

One of the important aspects of Hindu society is the caste system, which it has inherited from the past, embedded as the system is in the structure of the society. In case of Assam, it is generally accepted that the caste hierarchy in Assam is neither very rigid nor is it very visible. According to Barkataki (1969): 'The Assamese

Table 11.29 Percentage of different categories of Hindus

District	Hindu tribal	Hindu tea garden coolies	Hindu exterior depressed class	Other Hindus	Total Hindu	Tribal	Muslim	Others
Goalpara	8.5	4.6	1.8	28.8	43.7	10.2	43.9	2.2
Kamrup	13.1	2.5	4.4	52.7	72.7	2.0	24.6	0.7
Darrang	8.9	31.8	2.8	34.5	78.0	7.6	11.5	2.9
Nowgong	10.5	7.3	8.4	31.8	58.0	9.6	31.6	1.0
Sibsagar	6.0	33.8	4.0	46.4	90.2	3.4	4.7	1.7
Lakhimpur	9.5	48.9	3.3	29.6	87.3	2.0	3.6	3.1
N.C. Hills	73.1	6.0	–	–	–	14.9	–	6.0 (tribal Christians)

Source: Census of India (1931, vol. III Assam, Report I-A, Appendix, pp. 226–27)
1. Hindu Tribals include Kachari (including Mech, often censused as Boro-Kachari) and others like Miris, Lalungs, Rabhas, Hajong, Tiparas and Deoris of Upper Assam
2. The Ahoms are not considered Hindu tribe and are classed as a caste Hindu, because they were Hinduised for a very long period and were completely assimilated in the Hindu fold and had even adopted Assamese as their language

society is marked by the absence of a rigid caste system as is the case in the rest of India. There was no untouchability in the strict sense of the term. Even the Kaivartas, converted tribals and Hadis (Baniyas) were not considered outcaste … though they did not enjoy all the privileges'. Yet, no matter how the Hindu society is organised, it has not been able to shed the caste label, and the castes do exist, though the caste hierarchy is amorphous. There may not be a clear-cut distinction between a higher and a lower caste, yet the castes do exist, and some castes consider themselves superior to others.

That the castes exist is seen clearly from the Indian Census reports starting from 1881 till 1931, during which period castes were enumerated. For example in 1931 Census of Assam, a large number of castes were shown. The Hindus were grouped into four categories:

1. Hindus
2. Hindu 'exterior' castes (depressed castes)
3. Hindu tea garden castes
4. Tribal Hindus (Hindus still preserving their tribal organisation)

Description on the basis of caste was outlawed in Indian Constitution, and no caste data were published by Indian Census for decades. The introduction of reservation in education and employment has brought the caste system centre stage. Many communities aspire to be classed backward to entitle themselves to the advantage of reservation in educational institutions and government jobs.

In the absence of caste data for 2001, the strength of different categories of Hindu community in 1931 is quite instructive (Table 11.29).

Table 11.30 Number and distribution of Hindu castes, enumerated in 1931

Caste	Males	Females	Total	% of Hindu population	Main areas
1. Brahmans	87,864	71,252	159,116	3.06	Sylhet, Kamrup, Sibsagar, Darrang
2. Kayastha	76,303	59,287	135,580	2.60	Sylhet and Cachar
3. Ahoms	129,989	119,445	249,434	4.79	Sibsagar, Lakhimpur
4. Castes classed as tea garden coolie castes	681,596	604,677	1,286,273	24.71	Lakhimpur, Sibsagar, Darrang, Sylhet, Cachar
5. Exterior castes[a]	313,145	283,773	596,918	11.47	Sylhet, Cachar, Nowgong, Kamrup
6. Other Hindu castes and tribes	–	–	2,777,329		

Source: Census of India (1931)

[a]The Hindu exterior castes equated with depressed classes include Namsudra, Kaibarta (Nadiyal), Bania (Brittial Bania), Hira and sweeper castes in Assam valley and Namsudra, Kaibarta, Mali, Muchi, Dhuti or Dhobi, Patni, Jhalao or Malo Yogi, Mahara, Sutradhar and sweeper castes in Surma valley

The second tier division included tribes and castes like Ahirs, Brahman, Dhobi, Kayastha, Kurumi, Mali, Nai, Rajput and Teli.[22] In 1931, the province of Assam that included the Sylhet district of Bangladesh besides the areas of the present states of Nagaland, Mizoram and Meghalaya had 5,204,650 Hindus in the total state populated of 9,247,857. The Hindu fold consisted of a number of castes; the number and distribution of a few Hindu castes as they appear in 1931 are given in Table 11.30.

The Gazetteer of Assam[23] mentions three categories of Hindu castes:

1. Indigenous groups.
2. Immigrated from East Bengal (actual words in the Gazetteer are 'new imports from East Bengal').
3. Other castes migrated from other parts of India.

Indigenous castes – Brahmin, Grahbipra or Granak, Kayastha, Kahla, Mech, Baisya or Banika, Yogi or Nath, Sonari or Bonia, Charal or Hira, Brettial Barnia, Hari, Kaibarta or Nadiyal, Joloi, Keot, Napit, Sut and Kachari or Sonowal or Sarania.

Castes that immigrated from Bengal – Barui, Baidya, Das or Namsudra, Saha, Sutradhar, Mahishya, Patni, Jhalo or Malo or Jhalo Malo, Sudra, Tanti, Dholi, Mahara, and Mali or Bhuimali

The other castes from other states of India – Muchi or Rishi, Basphar, Mehtar and Lalbegi

[22]The 1931 Census of Assam also offers an explanatory note titled 'On Some Castes and Caste Origin in Sylhet' authored by Prof. K. M. Gupta of Murari Chand College, Sylhet, attached as appendix C, to part I-A.

[23]Gazetteer of India, Assam State, vol. I, 1999, Govt. of Assam, Guwahati, p. 284.

Some Traditional Specific Castes in Assam Society

The Brahmins

A class of people who migrated to Assam in early historic times. A priestly class, they promoted learning, respect for scriptures and traditional learning especially Sanskrit with many branches like grammar, literature, astronomy, philosophy and jurisprudence. The class of Brahmins who specialise in Hindu calendar and astrology and domestic rituals are called '*Grahbipras*' or *Ganak*. Their number is relatively small and a large number of them have shifted to other intellectual pursuits and follow modern professions. In 1931, the total strength of Brahmans was 159,116, of which over 30 % were settled in Barak valley largely in the district of Sylhet, followed by other districts like Kamrup, Sibsagar and Darrang.

Kayasthas

They are the second most important upper caste Hindus in Assam. Their population was 135,590 in 1931. Like the Brahmins, Kayasthas were highly concentrated in Sylhet district, which together with Cachar accounted for roughly 70 % of the population of this community. In fact, both the upper caste communities Brahmins and Kayasthas appear to have immigrated to Sylhet that was once a part of Kamarupa on the invitation of the kings of Kamarupa, particularly those of Pala dynasty. Kayasthas have an allied caste, the Vaidyas. The Kayasthas have surnames like Gupta, Dutta, Nag, Palit, Chandra, Kar, Nandi, Kundu, Pal, Deva, Som, Raksit, Biswas and Guha. They were traditionally a class of writers and administrators, quite dynamic and quick to adapt to emerging situations. A large number of them were brought to Assam by the British to assist them during the early days of their administration. They held many administrative and supervisory posts, familiar as they were with the system of administration, having studied at Calcutta and worked with the British administration. Assam today has a fair share of this caste in its population. Many Kayasthas in Assam are the descendents of Bhuyans who owned small principalities in Central Assam. Popularly known as 'Bora-Bhuyans', they were often a balancing force in terrestrial disputes during the pre-British period. The distinguished saint poet of the fifteenth century, Sankardeb, was born in a Kayastha family.

The Kalitas (Kolitas)

A caste of agriculturists, they are believed to be one of the Aryan colonists who introduced plough cultivation in Assam. They seem to have a Kshatriya origin and, after living for centuries in Assam, developed features, which show a great variety. They are not so fair as the Ahoms, but 'they have oval faces, well shaped heads, high noses, large eyes, well developed eye-lids and the light supple frame of pure Hindu' (Dalton 1872:79). In modern times, the Kalitas have taken a variety of professions after which they are known. There are 'Kumar Kalitas, 'Mali Kalitas', 'Nat Kalitas' and 'Bez Kalitas'.

Occupational Castes

Flexibility and the change in the caste's occupation is so common that the traditional occupational castes hardly exist. Some of them are found to have different occupation. One may call Kamar (potter), Tanti (weaver) and Nauki-Nadiyal (boatman) as occupational castes. Castes like Yogi (Nath) known for drum beating in history have taken to agriculture. Haris, employed as scavengers by Ahoms in upper Assam, have become goldsmith in lower Assam. Most of the castes, leaving Brahmins, Kayasthas, Kalitas and a few others, are included in the category of Scheduled Castes, the depressed classes of British days.

The Scheduled Castes of Assam[24]

Scheduled Castes is a category that comprises all the depressed classes, which are listed in the Indian Constitution under some specific schedule. There are 16 Scheduled Castes in Assam, of these the two most numerous are Kaibarta or Jalia and Namsudra. Others of lesser importance are Patni, Jhalo and Dhupi or Dhobi, etc. The state has 6.85 % of its population classed as Scheduled Castes, with highest concentration in the plain areas of Cachar, Kamrup, Marigaon, Karimganj and Hailakandi. Each of these districts has over 10 % of its population composed of Scheduled Castes.

The concentration of Scheduled Castes in different districts and the major Scheduled Castes of each district are given in Table 11.31.

Of the 16 scheduled castes communities, the most common and the most numerous are Kaibartas followed by Namsudras, Patnis, Jhalos, Sutradhars and several generic groups.

The Namsudras and Kaibartas

There is hardly a district where Namsudras are not found. Namsudras were also known as 'Chandals'; the latter term being too derogatory is now dropped. They are a fishing and boating caste, believed to have been originally propagated by the 'union of a Brahmin woman with a Sudra' (Allen 1905:88). A section of this group is formed into a group called Hira. They once worked as potters, without using the wheel. With the lapse of time Namsudras have taken to agriculture, in addition to that usual occupation of boating and fishing. The Kaibartas are as ubiquitous as the Namsudras, but while the former are indigenous to Assam, the latter are believed to have arrived from Bengal. In the eastern districts of the state, they are far more numerous than the Namsudra. Kaibartas are the fishing community, but don't sell fish in the market. In Assam, a land of great rivers and heavy rainfall, fishing and boating have been an occupation. Why they remained

[24] The scheduled castes of Assam as mentioned in the S. C. and S. T. notification order 1956 are (1) Bhasphar, (2) Bhuimali or Mali, (3) Brittial Bania, (4) Dhupi or Dhobi, (5) Dugla or Dholi, (6) Hira, (7) Jalkot, (8) Jhalo Malo, (9) Kaibarta, (10) Lalbagi, (11) Mahar, (12) Mehtar of Bhangi, (13) Muchi or Rishi, (14) Namsudra, (15) Patni and (16) Sutradhar.

Table 11.31 Distribution of scheduled castes in Assam

District	Population and % of Scheduled Castes in the district	Chief Scheduled Castes in the district	District	Population and % of Scheduled Castes in the district	Chief Scheduled Castes in the district
Kokrajhar	31,167 (3.4)	Namsudra, Sutradhar, Kaibarta	Dhemaji	30,472 (5.32)	Kaibarta, Namsudra, Jhalo
Dhubri	63,208 (3.8)	Namsudra, Jhalo, Kaibarta	Tinsukia	31,315 (2.72)	Kaibarta, Namsudra, generic castes
Goalpara	39,462 (4.8)	Namsudra, Kaibarta, Sutradhar	Dibrugarh	48,024 (4.05)	Kaibarta, generic castes, Namsudra
Bongaigaon	92,770 (10.2)	Namsudra, Kaibarta, Sutradhar	Sibsagar	35,759 (3.7)	Kaibarta, Namsudra, generic castes
Barpeta	93,861 (5.7)	Namsudra, Kaibarta, Jhalo	Jorhat	78,663 (7.87)	Kaibarta, Brittial Bania, generic castes
Kamrup	10,541 (6.76)	Namsudra, Kaibarta, generic castes	Golaghat	51,169 (5.4)	Kaibarta, Muchi, Dhupi
Nalbari	86,236 (7.5)	Namsudra, Kaibarta, Dhupi	Karbi-Anglong	29,520 (3.6)	Namsudra, Kaibarta
Darrang	6,464 (4.5)	Namsudra, Kaibarta, Jhalo	N.-C. Hills	3,360 (1.78)	Patni, Bhuimali, generic castes
Marigaon	100,346 (12,9)	Namsudra, Kaibarta, Hira	Cachar	208,235 (14.4)	Patni, Kaibarta, Namsudra
Nagaon	215,209 (9.3)	Kaibarta, Namsudra, Patni	Karimganj	130,957 (13.0)	Namsudra, Patni, Kaibarta
Sonitpur	87,900 (5.2)	Kaibarta, Namsudra, Jhalo	Hailakandi	59,251 (10.9)	Patni, Namsudra, Muchi
Lakhimpur	79,060 (7.8)	Kaibarta, Namsudra, Brittial Bania			

Sources:
1. Total S. C. population is taken from Census of India 2001, Series 1, Final Population Tables, pp. 86–90
2. Figures for individual S. C. community are from the District Basic Data Sheet of National Informatics Centre

underprivileged and poor to be given the status of a depressed caste can be explained by social history of India. Even Patnis of Cachar region are akin to Namsudras having acquired a different name. They, like the Kaibartas, also have fishing as their main profession.

Most of the castes do not have a surname or a title to give out their caste identity. It is only a matter of their lineage. In fact, caste distinction and hierarchy are not very visible in Assam, though the government records and Assam State Gazetteers continue mentioning the castes as elements in the Assamese society.

Absence of Caste Hierarchy and a Fluid Hindu Society in Assam

A characteristic feature of Assamese Hindu society is a near absence of the tyranny of caste hierarchy. There is 'no rigid caste system in Assamese society as is the case in the rest of India' observed Barkataki (1969). According to him two castes, Brahmins and non-Brahmins, and except for 'Kaivartas' who are classed as Scheduled Castes, have free intercourse and intermarriage among non-Brahmins, such as Kalitas (originally Kayasthas of Aryan stock) and Keots who are of Mongolian origin. Almost similar observation was made by Cantlie (1984) in her remarks that 'caste in Assam is to be understood as an extremely fluid process which does not correspond in a number of aspects with the current anthropological model' and seems to agree with Barkataki in her conclusion that 'with the possible exception, therefore, of Kayasthas, the clean castes are classed as either Brahmins or Shudras'…. Also the degree of segmentation is unusually low and in the majority of cases stops at the first order, that is, at the level of caste and subcaste. There are no endogamous sections among the Brahmins or Kayasthas (with the exception of Satra families) (Cantlie 1984:247). This is corroborated by an earlier observation of Choudhury (1987:313) that the Brahmins of Assam, in spite of their pride in social superiority, were liberal in outlook regarding occupations and their observation of social laws. In fact, Brahmins of Assam have always followed a rather flexible system, not as strictly rigid as in other parts of India, even in respect of food.

A near absence of rigidity in caste system, intermarriage among the castes across the caste spectrum, a liberal social attitude and fluidity in movement from one caste to another either through marriage or through material prosperity have to be seen through a number of historical facts. Firstly, first generation of Brahmins who came from the Gangetic plain did not have a long period to propagate the divine system of '*varnas*' and the merits of caste system, giving it a hierarchical order. Secondly, a large mass of Hindu fold in Assam is derived from conversion of the pre-existing Mongoloid stock who took to Hinduism without subjecting themselves to a system of caste by birth. A far more important reason that contributed to the establishment of an egalitarian society and demolition of caste hierarchy was the arrival on the scene of Sankardeb, a religious reformer, in the late fifteenth century. Supported by a succession of disciples, he introduced devotion to God, 'Bhakti', as the principle mode of worship. It was based on 'Bhagwat Purana'; the cult is also known as Bhagwat or Bhagavati Dharna, simplified in his creed 'Ek Sarana Nama-Dharna' implying surrender to God. Shorn

of idol worship and elaborate rituals, this cult was based on recitation and chants, all in the praise of God. Simplicity of this faith and the sincerity of its preachers attracted most Hindus of Assam to it. To propagate the religion, a number of monasteries called *satra* were established, and most of the Hindu families in Assam are attached to one satra or the other. These satras also have their annual or periodic congregation where all the devotees assemble. The Bhagwat Dharma, while shunning Brahmanical rituals and animal sacrifice, opened the door to divinity to all its followers. This worked as a leveller where caste was disregarded and all were treated as devotees of God. Caste discrimination or caste hierarchy was to a large extent eliminated by this newly introduced faith. The reach of Bhagwat Dharma in Assam is so wide that every village has a *namghar*, a substitute for temple without idol worship, where *kirtan* chanting of prayers is the principal mode of worship. Everyone under this faith is a creature of God and not an individual with a caste label.

The Ahom Administration and Complete Suppression of Caste Labels

The Ahoms who entered Assam in the beginning of the thirteenth century subdued most of the local and small regional powers and petty chiefs and ruled the state for over 600 years. The society under their rule was organised based on authority, obligations and privileges that were granted to individuals and groups under a system of administration that rested on the functioning of the *paik* system.[25] Under this system the entire manpower of the kingdom was classified into two categories, the *kari paiks* who were required as manual workers or foot soldiers and the *chamua paiks*, who represented the entire nobility and officialdom. From *Gohains* on the top of the ladder to the lowly *paik* as the foot soldier of the system, the whole range of hierarchical positions had certain privileges and were armed with specific level of authority. Thus, the administrative system starting with *Gohains* and ending with *Boras* carried out a large number of hierarchical positions like *Bar Gohain*, *Burha Gohain* and *Barpatra Gohain*, each with the privileges and responsibilities assigned to the rank. The positions held by an individual turned, in due course, into a title that became hereditary.

In the context of caste, what appears likely, and even obvious, is that even after the accession of the Ahom kingdom by the British and the establishment of a new administration system, the officers working under the Ahoms retained their titles, though without any usual power and privilege. The paik system was abolished quite early during the British rule, yet the Hindus still carry these titles as their surnames, which speak of their social position during the Ahom rule, and suppress the caste surname if any to which they belonged. It is quite likely that some of them had not inherited any caste surname and this may specially be the case with those who joined these ranks from the non-Hindu tribal flock, but a large number with the exception of Gohains, who were kinsmen of the king, had their roots in the society with some markings of caste. The adoption of titles like Phukan, Rajkhowa, Barua,

[25] The details given are based on E. Gait (1906:222–235).

Hazarika and Saikia in preference to a surname, originating from the caste, had an obliterating effect on caste system. Besides, the Ahom administration did not permit untouchability and even Kaivartas and Hadis (Baniyas) were not considered untouchables (Sarma 1981). To Ahoms, the castes had very little meaning except in the eighteenth century, when the Ahom king Rudra Singh recognised the importance of learning and invited Brahmins from Bengal to get himself initiated into Hinduism.

Today the Assamese society is replete with surnames like Phukan, Barua, Hazarika, Saikia, Bora, Gohains and Bardolais. None of these surnames suggests any caste, though it carries a mark of distinction as it existed during the rule of Ahoms. To the present writer, the Ahom rule was the main cause that not only worked as a leveller but also gave sanction to a new system where the social status was based on one's rank in the administrative hierarchy and not the inherited caste.

The Garden Coolies or Coolie Castes

Besides the various castes that exist, or don't exist, there is a class of people who were grouped together as one class, labelled as 'garden coolie caste' in 1931 Census of Assam. This is what C. S. Mullan (1931:222) wrote about the tea garden workers:

> Their name is legion, some are castes recognized in their provinces of origin as definite Hindu castes; others would be considered Hindu castes merely by courtesy while other(s) – such as Mundas and Santals – cannot be said to be castes at all but aboriginal tribal communities. Coolies of Assam form, however, a separate class of population, no matter what caste or tribe they belong to, and hence seem best to treat all cooly castes and tribes under one heading, for all have one common characteristic and that is, in Assam, a "cooly" is always a "cooly" and whether he works in a garden or whether he has left the garden and settled down as an ordinary agriculturist, his social position is nil. From the point of view of Assamese society, a person belonging to any cooly caste or tribe is a complete outsider and is as exterior as any or the indigenous castes I have classed as exterior.

The number of immigrant coolies and their descendents in the tea garden as estimated in 1921 was as follows.[26]

Censused coolies	840,000
Ex-coolies	360,000
	1,200,000

This number represents the number of persons who were in Assam in 1921 directly on account of tea industry. In addition, there was an estimated additional of 130,000–140,000 persons in Assam indirectly connected to the industry. These consisted of traders, mistries, carters, earth workers, etc. Another estimate made in 1931 by C. S. Mullan gives the strength of coolies as 1.4 million. Out of this, Assam valley had 1,050,000 coolie population and Surma (Barak) valley 350,000 persons working as tea garden coolies. The largest concentration was in Lakhimpur, Sibsagar

[26] Census of India 1931, pt. I-A, Report, p. 222.

Table 11.32 Concentration of Hindu coolies in Assam in 1931

Districts	% of Hindu coolie of total population
Goalpara	4.6
Kamrup	2.5
Darrang	31.8
Nowgong	7.3
Sibsagar	33.8
Lakhimpur	48.9
Balipara Frontier Tract	16.0
Sadya Frontier Tract	6.6
Sylhet	7.0
Cachar Plains	29.5

Source: Census of India (1931, ibid, p. 226)

and Darrang in that order. The percentage of Hindu coolie concentration in the main districts having large tea plantations in 1931 is as follows (Table 11.32).

At the height of the tea industry development, the highest concentration of the tea plantation workers was in Lakhimpur, Sibsagar and Cachar with 48.9, 33.8 and 29.5 % concentration of tea plantation workers, respectively. The recruitment of tea garden workers was initiated in the last quarter of the nineteenth century. The recruitment was done through contractors, called coolie catchers or through the Sardars, the old tea garden labourer. The entire family was transported. Dhubri was the gateway to Assam where the contractors handed them over to the tea garden authorities. In 1901, the tea labour force formed one-twelfth of the total population of Assam (Bose 1989:63). The origin of these tea garden workers in 1931 was as follows (Bose ibid):

Number of tea garden workers	Places from where imported
216,000	U. P., Bihar and Bengal
193,000	Santhal Pargana, Chotanagpur
78,000	Central Provinces
59,500	Madras Presidency
9,000	Other regions
65,100	Local recruits

Tea Plantation Workers Today

The total number of labour employed in the tea industry in Assam in 2000 was 602,531, of which 423,437 were the resident labour, i.e. these were the traditional garden coolies. They are largely concentrated in the north-eastern part of the valley, in Dibrugarh, Sibsagar, Jorhat, Darrang and N. Cachar district. It may be mentioned that in the early part of the last century, there were not many workers in the tea gardens. Even today, almost the entire labour force of tea plantation is constituted by the descendents of early plantation workers who migrated to Assam. Living in

what are known as coolie-lines, these descendents of immigrant labour have been patronised by tea planters, providing them assured employment and minimum residential, health and education facilities. They have, in the course of a century, developed a distinct community of plantation workers and even evolved a language, the 'garden labour language' that is an understandable amalgam of Hindustani, Assamese and Bengali. The garden labourers of Assam though distinct as a group are completely assimilated in the Assamese society and form an important segment of the Assamese community, and despite the fact they speak a patois that is particular to their class, they learn Assamese, observe Assamese festivals and carry a single identity of being Assamese (Goswami 1984). There is no doubt that 'a new dimension was added to the Assamese culture by the teagarden labourers. They have developed a language of communication, commonly known in Assam as Bagania, a mixture of various tribal languages of the communities from which the teagarden labourers have been recruited, (yet) they are gradually becoming part of the Assamese nationality' (Baruah 1991:37).

In a study of multi-ethnic tea garden labour community of Assam, based on the case study of Hitika Tea Garden in Dibrugarh district, it was discovered that 'a good majority of tribes and castes who migrated from different parts of the country a few generations ago have, by now, become fully settled and dwell in either rent free quarters provided by teagarden authorities or on Government distributed land' (Kar and Barua 1979:33–42). Hitika Tea Garden itself has a labour population of 3093 distributed among 631 families, representing 42 different tribes and castes like Santals, Munda and Ghasi. A family has at its disposal 3,000 sq. ft of space with 425 sq. ft. of floor space in the living quarters. The tea garden workers have a better consciousness of being part of a labour force rather than a smaller socio-cultural group. In fact, they do not have enough scope to project their independent ethnic identity. Indeed, they are completely assimilated in the tea plantation workers community.

The Nepalese

Another immigrant community commanding a substantial number is that of Nepalese. There are 564,790 people in Assam who speak Nepali (Nepalese) as their mother tongue. More than one-fifth of the total population of Nepalese in India lives in Assam, where they form over 2 % of the population of the state. The Nepalese, though ubiquitous, are greatly concentrated in Tinsukia, Dibrugarh, Sonitpur and Karbi-Anglong districts. They have migrated to all parts of the North-East as well, and many of them have settled in Arunachal Pradesh, Meghalaya and Manipur. Most of the Nepalese are graziers who migrated along the Himalayan foothills, settled initially on uncultivated river islands or *char-lands*, occupied hill slopes and engaged in livestock farming and dairying. They also engaged in unplanned clearing of forests to be able to cultivate the land. The community devoid of any political ambition is very enterprising and diffused all over the state. Being largely Hindus, there is a good chance of their being assimilated in the Assamese society.

11.10.3.4 Muslims in Assam

An important religious group next to Hindus, Muslims in Assam have a population of 8,240,611 (2001), which is 31.12 % of the total population of Assam. As seen earlier, the Muslim population has grown steadily and rapidly over the last five to six decades and even spread horizontally inland in Assam valley as well as in Cachar. From a strength of 24 % of the total population of Assam in 1951, the Muslim population in the state has grown to more than 31 % in 2001. While in 1951, not a single district of the state had a majority of Muslim population, in 2001, as many as six districts (Dhubri, Goalpara, Barpeta, Nagaon, Hailakandi and Karimganj) have turned a Muslim-majority population. In contrast, the Hindu population has declined in proportion from 72.12 % in 1951 to 64.88 % in 2001.[27] Part of the reason may lie in splitting the districts and the creation of new districts. Goalpara district is split in five districts, three of which have a majority of Muslim population. Similarly, Hailakandi and Karimganj were carved out of Cachar, and they show a majority of their population composed of Muslims. What is clear is that the Muslim population has increased disproportionately in comparison to the population of other communities. This increase is partly because of a higher natural growth, but it is attributed largely to immigration from Bangladesh.

Origin and Grouping of Muslims

The Muslims in the valley started arriving in the Brahmaputra valley with the invasion of Bengal Nawabs starting from Mohammed-be-Bakhtiyar in early thirteenth century and ending with the invasion, retreat and final defeat of the Moghuls in the battle of Saraighat in 1671. The Muslims ruled the area around Gauhati periodically. With every invasion of Assam, some of the Muslim soldiers who joined the campaign did not return. Besides, the officials and the retinue of the ruling *subedars* of the Nawabs of Bengal or the Moghuls usually consisted of Muslims who preferred to remain in the valley for a permanent settlement. With the arrival of the British and freedom of movement across the subcontinent, Muslim peasants from Bengal began to migrate to Assam valley. The hardy Muslim peasants of Bengal did not find it difficult to reclaim the neglected waterlogged and marshy land or even the river islands. Their immigration, which started in the beginning of the twentieth century, continued even after 1947, and what was once an induced immigration to reclaim more land turned into a surreptitious, illegal infiltration of peasants from Bangladesh, earlier known as East Pakistan. Despite the resentment and opposition of the Assamese population, there h as been an incessant stream of illegal infiltration that swelled the population of Muslims in the state. The strength of Muslims in different districts of the state is given in Table 11.33.

[27] To make the 2001 population figure comparable to 1951, only seven districts – Assam plain division (Cachar, Kamrup, Darrang, Nowgong, Sibsagar, Lakhimpur) and United North Cachar and Mikir Hills district of Assam hill division – are taken into account. These add up to the area of Assam as it was in 2001.

Table 11.33 District-wise Muslim population in Assam (2001)

District	Muslim population in 2001	% of Muslim population of total population
I. *Muslim-majority districts*		
1. Dhubri	1,216,455	74.3
2. Goalpara	441,516	53.7
3. Barpeta	977,943	59.4
4. Nagaon	1,180,267	51.0
5. Karimganj	527,214	52.3
6. Hailakandi	312,849	57.62
II. *Other districts*		
7. Kokrajhar	184,441	20.36
8. Bongaigaon	348,573	38.5
9. Kamrup	625,002	24.8
10. Nalbari	253,842	22.1
11. Darrang	534,658	35.5
12. Marigaon	369,398	47.6
13. Sonitpur	268,078	15.94
14. Lakhimpur	143,505	16.14
15. Dhemaji	10,533	1.84
16. Tinsukia	40,000	3.5
17. Dibrugarh	53,306	4.5
18. Sibsagar	85,761	8.2
19. Jorhat	47,658	4.77
20. Golaghat	74,808	7.9
21. Karbi-Anglong	18,091	2.2
22. Cachar	522,051	36.1
23. N. Cachar Hills	4,662	2.5

Source: National Informatics Centre, Basic Data Sheets for each district, 2001

As can be seen from Table 11.33, the Muslims have by and large remained confined to the western part of Assam valley and the district of Cachar, Hailakandi and Karimganj in Barak valley. Most Muslims of Assam are Sunnis. They usually group themselves into three categories: Syeds, Sheikhs and Marias.

Syeds

Muslims are those who claim descent from Prophet Mohammad. The Muslim saint Hazrat Shah Milan, popularly known as Ajan Fakir, was a Syed. He came to Assam in the middle of the seventeenth century and propagated himself as a role model for other Muslims. The Syeds claim the highest position in Muslim society and as far as possible marry among themselves. *Sheikhs* are the common Muslims, and a majority of the Muslims in Assam are Sheikhs. The *Marias* are the descendents of

the captured Muslim soldiers. Traditionally they have been the metal workers.[28] There are also other Muslims carrying titles like Pathans who seem to have arrived with the Moghul army and remained in Assam, retaining their titles. Large part of the Muslim population, however, came in Assam as immigrants and are known as *Mians*, also known disparagingly as Mymensingias as a large number of them came from Mymensingh district of Bangladesh. The distinction between these subcommunities is fast disappearing and the immigrants from Bangladesh have started intermarrying with the Marias. The preachers among the Muslims are known as Maulvis, and the priests are usually recognised as 'Quazis'.

Muslim–Hindu Relations

The relations between the two communities have different shades depending on whether the Hindu and Muslims form part of the same village and had been existing cheek by jowl for generations or whether the case relates to a newly formed village of immigrant Muslims. In the traditional villages like Singimari in Darrang district, a village with 60 Hindu and 54 Muslim households, the Hindu–Muslim relations have been found to be one of economic complementarity as well as socio-economic interactions (Nisar and Ali 1979). The village consists of three clusters where patrilineally related families live. The goodwill between the two communities is because of the fact that both the communities belong to the same economic group. There is certainly a ritual distance between these two communities, but in day-to-day interaction, neither Hindus nor Muslims envisage their positions as dominant or subservient to each other.

The new settlements of immigrant Muslims are relatively isolated, often on *char-land* or reclaimed marshy land. In normal times, there is tolerance and apparent goodwill, but one may notice a grudging acceptance of the existence of these villages among the pre-existing settlements. What is really heartening is that the immigrant Muslims have been able to adapt to the Assamese way of life rather fast. They speak Assamese and as matter of generating goodwill try to have good relations with their non-Muslim neighbours.

11.10.3.5 The Christians

The Christians, with 3.7 % of the state's population, make the third largest religious group in Assam. This is higher than the Indian average of 2.4 %. This percentage is much higher in the hilly states of Nagaland, Mizoram and Meghalaya where Christianity is the dominant religion and Christians form 90, 87 and 70 % of the population of these states, respectively. It needs be pointed out that the proselytising influence of Hindu medieval preachers did not move beyond the valleys of the Brahmaputra and Barak and the higher forest-covered hilly areas inhabited by indigenous tribes came under the influence of Christian missionaries who inculcated in them the idea of a

[28] This division of Muslims is based on the Gazetteer of India, vol. I, Assam State, pp. 278–79.

supreme being, the notion of God and Jesus. They introduced them to the notion of hygiene, medicine and health care and gradually convinced them of the unity of humankind inherent in the belief that all human beings are the children of God. Gradually by acts of compassion and persuasion, the animists of the hills were won over, and they adopted Christianity as their faith. They learnt the written mode of communication and moved towards modernity. Christianity in the North-East developed after the establishment of British rule. The first batch of Missionaries to arrive in North-Eastern India were those sent by Welsh Calvinistic Methodist Mission, followed by American Baptists who spread to Nagaland and other parts of the region. They were the pioneers in the field of education, both in the Brahmaputra valley and the tribal hilly region. 'They established churches, schools and hospitals for moral and material welfare of Nagas… Apart from education, missionaries also made a significant contribution in introducing modern western healthcare in the region. Even now some of the best hospitals of the North-East are managed by missionaries. The Mission Hospital at Guwahati, Tezpur and Dibrugarh in Assam, the Synod hospital at Shillong, Jowai in Meghalaya are a few of the illustrations' (Roy Burman 2004). In the valley, Hinduism was a well-established religion for centuries, and despite the Christian missionaries operating in many parts of the state, Christianity could not dislodge other religions and remained the religion of a small minority. A comparison made by Dubey (1972) about the educational and cultural development of the tribes of Brahmaputra valley vis-à-vis those in the hilly peripheral area brings out some interesting results. He justifiably concludes that the Nagas, Khasis and Mizos professing Christianity are relatively more literate and educated and are more westernised, whereas the tribes of Brahmaputra valley like the Kacharis, Bodos and Miris who turned to Hinduism have less literacy, and their way of life, economy and occupational structure are still traditional.

The distribution of Christian population in Assam is un-uniform, but all the districts of the state have some Christian population, the lowest being Hailakandi and Karimganj in the Barak valley and Marigaon, Barpeta and Dhemaji in Brahmaputra valley. The highest concentration of Christian population is in Kokrajhar, the westernmost district of the state, both in absolute number and in relation to the total population of the district. Kokrajhar has a Christian population of 124,270 followed by Karbi-Anglong district with a Christian population of 117,738, forming about 15 % of the population of the district. What is significant is that the Christian population is meagre in districts with a majority of Muslim population.

11.10.4 Language of the People

Language is a universal vehicle of communication and a medium of expression of thoughts, beliefs and ideas. It also imparts a sense of cultural identity among the speakers of a specific language. In case of India, the states were recognised on a linguistic basis, and the linguistic boundaries between the adjacent languages

formed the boundaries of the states. Language formed the basis of the reorganisation of Indian states, creating linguistic states. In the large Hindi-speaking belt, there are several states organised on the basis of their history and culture. Assam, unlike many other states, is not a unilingual state. The people in Assam speak a number of languages and a large number of dialects. There are 114 languages in Assam spoken as mother tongue, of which about a dozen are spoken by more than 100,000 people. The principal scheduled languages spoken in the state are Assamese, Bengali, Bodo, Hindi, Nepali, Manipuri and Santali.

It was a unilingual state during the pre-British period when Brahmaputra valley from Sadiya to Dhubri was known as Assam and perhaps only spoke Assamese. But even in those remote days, there were some people speaking Bengali in areas like Dhubri lying on the border of Bengal. Besides, a large section of tribal population – and their number was legion – spoke their own languages like 'Mishing', Bodo, Barahi and others. The situation changed completely after the British reorganised the state and tagged the entire North-East territory like Naga Hills, Lushai Hills, Khasi–Jaintia Hills, Garo Hills and Cachar Hills and Barak valley, on to the main area of Assam represented by Brahmaputra valley. Assam thus became a state representing a mosaic of contrasting physiography, people, culture and economy, each component unit having its own language with English as the administrative language of the state. Thus, the state, its component units and the multiplicity of languages are part of a legacy of the colonial past as well as the result of successive and frequent reorganisation of the territories of the North-East during the post-independence period, leading to a vivisection of colonial Assam and the emergence of a number of small states based on cultural identity of certain tribes. What is left, however, is not entirely a monolingual block. There are two principal languages occupying two distinct geographical divisions of the state, viz. the Brahmaputra valley speaking largely Assamese and the Barak valley where a majority of the people speak Bengali as their mother tongue. There is, however, no watertight compartmentalisation. There are Assamese-speaking people in Barak valley as much as there are Bengali-speaking people in Brahmaputra valley.

Before 1947, Assam was a much larger state then known as Assam Province of which Sylhet district, now in Bangladesh, was part and where 93 % of the people had Bengali as its mother tongue. Similar was the case with Cachar and Goalpara where majority of the people had Bengali as their mother tongue. These densely populated districts swung the balance in favour of Bengali. But leaving aside these areas, Assamese was the mother tongue of the majority of population in the entire valley of Brahmaputra. The tribal communities recorded their own spoken language as their mother tongue. The linguistic picture in Assam in 1931 was as follows (Table 11.34):

The linguistic composition of the state, as it existed in 1931, generates a picture where Assam does not appear to be exclusively an Assamese-speaking state. Majority of the people in the province, under the British rule, spoke a non-Assamese language as their mother tongue. In fact, the relative strength of Assamese-speaking people in Assam was very low in the early part of the last century despite the fact

Table 11.34 Number of people speaking different languages in Assam in 1931

Administrative units	Number per 10,000 of total population who speak – 1931					
	Assamese as mother tongue	Bengali as mother tongue	Tibeto-Burmese as mother tongue	Khasi-Synteng as mother tongue	Others	Total
ASSAM	2,157	4,246	1,753	253	1,591	10,000
Brahmaputra valley	4,197	2,303	1,186	3	2,311	10,000
Goalpara	1,826	5,397	1,765	–	–	10,000
Kamrup	6,650	1,745	1,148	6	1,012	10,000
Darrang	3,302	1,626	1,065	1	4,006	10,000
Nowgong	4,220	3,437	1,308	3	1,032	10,000
Sibsagar	5,396	786	776	1	3,041	10,000
Lakhimpur	3,153	1,069	708	3	5,067	10,000
Surma valley	10	8,729	332	11	918	10,000
Sylhet	5	9,212	136	9	638	10,000
Cachar plain	35	6,280	1,328	19	2,338	10,000
Hills	70	248	7,545	815	322	10,000
North Cachar	107	333	8,186	214	1,160	10,000

Source: Census of India (1931, Vol. III, Assam pl. I-A, Report p. 184). In the last column 'others' is added by the author. Others include any other Indo-Aryan language or any Austric or Dravidian language or even Indo-European language

that Indo-Aryan languages dominated the area. The percentage of people speaking Assamese as their mother tongue in Assam as a whole in early twentieth century was as follows:

Year	Percentage of Assamese speakers (%)
1901	22.0
1911	21.7
1921	21.6
1931	21.6

Source: Census of India 1931, Vol. III, pt. I-A, Report, p. 177

The linguistic composition of the state (Table 11.35) has undergone a series of changes since 1931, when Assam was a large territory including Sylhet district of Bengal, now in Bangladesh, Meghalaya, Naga Hills and Lushai Hills (Mizoram) commanding an area of 55,014 sq. miles (142,486 km^2). The change in the linguistic make-up of the state is attributed to a change in the outline and area of the state following the partition of the country when a greater part of Sylhet district was ceded to East Pakistan. This resulted in the transfer of about three million Bengali-speaking population to Pakistan. Secondly, the formation of new states like Nagaland, Meghalaya and Mizoram took away a large chunk of Indo-Austric-speaking Khasi population and equally large number of Naga, Mizo and Kuki population who speak

Table 11.35 Strength of different languages spoken as mother tongue in Assam, in 1931, 1951 and 2001

Language spoken as mother tongue	Years		
	1931	1951	2001
Assamese	1,994,564	4,972,493	12,623,234
	(21.6)	(55.0)	(47.36)
Bengali	3,966,363	1,719,155	7,255,880
	(42.9)	(19.1)	(27.22)
Hindi	589,841	335,668	1,017,424
	(6.4)	(3.7)	(3.82)
Bodo	282,582	166,420	1,292,950
	(3.1)	(1.84)	(4.85)
Nepali	136,106	125,320	564,734
	(1.5)	(1.38)	(2.1)
Miri/Mishing	80,831	130,581	517,170
	(0.9)	(1.44)	(1.94)
Karbi/Mikir	126,457	130,600	406,160
	(1.4)	(3.7)	(1.52)
Santali	293,896	188,567	240,770
	(3.2)	(2.08)	(0.9)
Oriya	202,737	114,253	223,638
	(2.2)	(1.26)	(0.83)
Manipuri	368,247	89,433	154,059
	(4.6)	(0.98)	(0.57)
Garo	192,480	236,032	143,257
	(2.2)	(1.26)	(0.53)
Rabah	27,006	18,822	136,269
	(0.29)	(0.2)	(0.50)
Dimasa	14.680	6,015	107,070
	(0.16)	(0.06)	(0.4)
Munda	–	–	93,088
			(0.35)
Kurukh/Oraon	52,516	27,430	72,311
	(0.56)	(0.30)	(0.27)
Mundari	–	–	32,718
			(0.12)

Source: Census of India 1931, vol. III, Assam pt. I-A, Report, pp. 182–183; for 1951 language figures, refer to Census of India 1951, vol. XII, Assam, Manipur & Tripura pt. II-A tables, pp. 70–86; for 2001 figures refer to Census of India 2001, Language, pp. 46 and 280

one or the other Tibeto-Burman languages. The relative strength of population speaking different languages as mother tongue changed. The loss of territory and the non-Assamese-speaking people raised the relative strength of Assamese-speaking people. The immigration of Bangladeshis did not raise the number of people speaking Bengali as their mother tongue, as the immigrants often declared Assamese as their mother tongue to hide their identity.

Table 11.36 Distribution of Assamese-speaking population in Assam (1991)

Percentage of speakers of Assamese language	No. of districts	Names of districts
>90	1	Sibsagar
80–90	4	Jorhat, Golaghat, Marigaon, Dibrugarh
70–80	3	Dhubri, Kamrup, Nalbari
60–70	4	Nagaon, Darrang, Lakhimpur, Barpeta
50–60	3	Tinsukia, Goalpara, Sonitpur
40–50	2	Dhemaji, Bongaigaon
30–40	Nil	–
20–30	1	Kokrajhar
10–20	Nil	–
5–10	1	Karbi-Anglong
<5	4	N. C. Hills (3,28), Cachar (0.48), Karimganj (0.33), Hailakandi (0.16)
Total	23	

Source: Census of India (1991:26–27)

The change in the territorial shift and strength of different linguistic groups is obvious. During the colonial period, most linguistic groups, originating from outside the North-Eastern region, were largely concentrated in the tea garden areas. These included Santals, Kharia, Kurku and others of Munda branch, as well as Kurukh and Gondi of Dravidian group. The Oriya- as well as Bhojpuri- and Hindi-speaking people also clustered in the tea garden areas of Eastern Assam. The situation is greatly modified today if not completely changed. The new entrants into Assam are traders, professionals and skilled workers who have spread all through the state, though their concentration is more in the urban areas.

11.10.4.1 The Principal Languages of Assam

Assamese

Assamese, the principal and official language of the state, is spoken by 48.8 % of the people of whom over 47 % speak the language as their mother tongue and the rest as a subsidiary language. From a mere 21 % during the colonial period to a position when over 48 % of the people in Assam speak Assamese as their mother tongue is a quantum jump. In most districts of the state today, Assamese is the language of the majority (Table 11.36). In the Barak valley districts of Cachar, Hailakandi and Karimganj, the hilly districts of North Cachar Hills and Karbi-Anglong and some districts in the western part of Brahmaputra valley, notably Bongaigaon and Kokrajhar, less than 50 % of the people speak Assamese as their mother tongue

Bengali is the principal language of Barak valley that is separated from Brahmaputra valley by Barail range. Not even 1 % of the people speak Assamese in

Table 11.37 Percentage of people speaking Bengali and Assamese in Goalpara district

	Years		
Language	1931	1951	1991
Assamese	18 %	62 %	55 %
Bengali	54 %	17.5 %	22.5 %

Note: Goalpara district till mid-1980 was a much larger district than what is at present and included in its ambit the present districts of Dhubri, Kokrajhar and Bongaigaon

any of the districts of Barak valley. The erstwhile Surma valley – now called Barak valley – is a continuum of Bengali linguistic region that has a large west–east sweep from Ganga delta to Barak basin. The merger of Sylhet district in Assam in 1874, though a territorial gain for the provinces, 'threatened to reduce the Assamese speaking people into a minority in their own state' (Baruah 1991). The hilly districts of North Cachar – now rechristened as 'Dima Hasao' – and Karbi-Anglong are largely inhabited by tribes like Dimasas and Karbis, and they speak their own language. It must be noted that both Dimasa and Karbi are recognised nonscheduled languages. The distribution of Assamese, as the mother tongue, in Assam as it existed in 1991 is as follows:

The West Assam districts, on the border of Bangladesh or West Bengal, are inhabited by people who, though part of Assam, have been traditionally speaking Bengali as their mother tongue. What is intriguing is that some of the districts like Dhubri, Barpeta and Nagaon, where majority of the population consists of Muslims, show preference for Assamese. The situation was not so before 1947 (Table 11.37). A change from Bengali to Assamese in a span of a decade or two is a complete switch over to Assamese, as a matter of strategy to secure their socio-economic interest and establish better rapport with the Assamese society.

Despite the regional differences, Assamese remains the principal language of the state. It is the mother tongue of the majority and is spoken as subsidiary language by the rest of the population. Many tribal groups like the Bodos, Miris and Karbis maintain their own language, though they speak Assamese outside the family and use the language for all official purposes. The Bodos adopted Assamese script and have adopted the language as a medium of instruction. There is a greater concentration of Assamese-speaking people in the mid-eastern districts of the state. In peripheral districts either bordering Bangladesh or Arunachal Pradesh, the languages of the neighbouring regions creep in.

Assamese, the principal and official language of the state, has a rich copious literature. The language developed in Assam almost concurrently with Bengali in Bengal. Assamese, the language of the Brahmaputra valley, not only unites the people located far apart in the state and reflects all the folkloric tradition, the ethos and the problems of the contemporary Assamese society. She is a common bond that unites the immigrants of diverse origin who ultimately merge their identity in Assamese society as Assamiyas.

Bengali

Bengali is the second important language of the state. An Indo-Aryan sister language of Assamese, it spread naturally in South Assam and other border areas of the state. It was brought and propagated by the early Bengali immigrants and spread all over the state. It is spoken by 75–80 % of the population of the three districts of Barak valley, viz. Cachar, Hailakandi and Karimganj where the speakers of the language have a strength of 76, 82 and 85 % of the population, respectively. The districts of Assam west of Nagaon have a fair strength of Bengali-speaking people. Thus, Kokrajhar, Goalpara, Bongaigaon, Bongaigaon and Barpeta have 20–25 % Bengali-speaking people. South Assam is a world apart. It appears a miniature of Bengal with its language, literature, food habits and social association. The three constituent districts of Cachar, Hailakandi and Karimganj form the Bengali counterpart of the Brahmaputra valley.

Assamese and Bengali Beyond Assam

These two principal Indo-Aryan languages spoken by the people of Assam have over the decades spread beyond the borders of Assam. One can observe then that some of the states like Nagaland, Meghalaya and Mizoram were the constituent units of Assam, before they were constitutionally given the status of full states. What is intriguing is that in the border states of Arunachal Pradesh, Nagaland, Manipur, Mizoram and even Meghalaya, the Bengali speakers far outweigh the Assamese-speaking people. This is a reflection of the migration trail that started from Bengal and continued even after the formation of East Pakistan and subsequently Bangladesh. The maximum impact of this migration is felt in Assam and Tripura as these are the neighbouring states, but part of this migration trail also reached Arunachal Pradesh, Nagaland and Mizoram. What is surprising is that even in Meghalaya overlooking the Brahmaputra valley, the number of Bengali-speaking people is five times higher than the number speaking Assamese. One of the reasons is that the Brahmaputra valley, the core area of 'Assamese', had enormous opportunity for agriculture and the people did not have to migrate elsewhere. The general reluctance of Assamese to migrate to areas of difficult terrain can be another reason.

Hindi

Hindi speakers, spread all over the state, have been historically tea garden coolies. Several generations of the immigrants are now settled in the valley as farmers, intermarried and are integrated in the society. A large number of manual workers – some can be observed working as coolies at Guwahati railway station – dhobis, vegetable vendors, cleaners and others have migrated to Assam and now form a part of Assamese society. Besides, masons, road-building workers, construction workers, railways *chowkidars* are often spotted to be Hindi speakers. During recent decades a small number of Hindi-speaking people have also taken up petty trades and

there are some skilled workers and employees of the Central Government, but their number is relatively small. Hindi speakers make the third largest linguistic group in Assam, after Assamese and Bengali.

Nepali

Nepali is spoken by Nepalese who also account for over 2 % of the population of the state. They are spread all over North-Eastern states and have made cattle grazing and dairying their favourite occupation. Nepalese are more numerous in North Cachar Hills, Tinsukia and Sonitpur. The language is confined to the families of the immigrants themselves.

Bodo

Bodo, one of the scheduled Indian languages, without a script of its own, is spoken by a million and a half people in the state. This is the language of Bodos, a tribal group, considered to be the earliest settlers of Brahmaputra valley. Many of the other nonscheduled languages like Garo, Rabha and Dimasa are sister languages of Bodo, showing essential unity in their structure and vocabulary. Long detachment from the parent language has given each of these languages and the linguistic group an independent status. Bodo is the largest linguistic group in Kokrajhar district in Western Assam, where roughly 40 % people speak the language as their mother tongue. Bodo-speaking people, like the Assamese speakers, are widely diffused, but language has not established its foothold in eastern part of Assam and remained largely confined in a narrow belt stretching from Kokrajhar to Sonitpur, north of Brahmaputra.

Miri

Miri is another indigenous language that is spoken by over half a million people largely in Dhemaji, Lakhimpur and Jorhat districts. The language is spoken by Miri tribe, which descended from Arunachal under pressure from other warring tribes and settled in Eastern Assam.

Besides the above languages, there are others which arrived in Assam with the immigrants. Bengali, Hindi, Nepali, Santali, Oriya, Oraon, Mundari and Punjabi, the non-Assamese languages, have reached the bank of Brahmaputra having migrated from other parts of India to Assam during the last couple of centuries.

11.10.4.2 The Uniqueness of the Linguistic Landscape of Assam

There are several unique features in the linguistic composition of the state. To start with, Assamese, the official language of Assam, is spoken by less than half the population of the state. Only 48.8 % of the population speaks Assamese in the state of

which 47.38 % speaks the language as its mother tongue. Secondly, there are districts where Assamese is not spoken even by 1 % of the population of the district. The entire Barak valley is devoid of any impact of Assamese, as not even 1 % of the population in the three districts of Cachar, Hailakandi and Karimganj speaks Assamese. Almost similar is the situation in the tribal districts of North Cachar Hills (Dima Hasao) and Karbi-Anglong districts, where Assamese is spoken by less than 10 % of the population. Even in Brahmaputra valley, Assamese is not the language of the majority of the people in the districts of Dhemaji, Bongaigaon and Kokrajhar. In case of Kokrajhar, Bodo-speaking people form the largest linguistic group. The most significant fact is the existence of a large number of tribal languages, a reflection of the primordial loyalty of different tribes who continue speaking the tribal language despite their familiarity with Assamese. Thus, Bodo, Miri, Rabha, Karbi, Dimasa, Lalung, Hmar, Deori, Santali and several other tribal languages are spoken by a substantial number of people. Of these, Bodo has already assumed the status of a scheduled language. The number of languages with their origin outside the state is legion. Besides Bengali, Hindi, Nepali, Oriya and Manipuri, the five scheduled languages, there are a number of nonscheduled languages like Santali, Kurukh/Oraon, Mundari and Gondi which have their origin outside the state.

There are in all 114 recorded languages in the state. This includes both scheduled as well as nonscheduled languages. Out of these, more than half have less than 1,000 speakers each. About one-third have less than 50,000 speakers each. The remaining 15 % – 16 languages – have each more than 50,000 speakers, and there are 13 languages which are spoken by more than 100,000 people; each of these Assamese, Bengali, Hindi and Bodo is spoken by more than a million people. Assamese is spoken by 13,001,478 (48.8 %) of which 12,623,234 (47.4 %) speak the language as their mother tongue.

11.10.4.3 Historical Background to the Linguistic Composition of Assam

Assam as a state was not formed as a consequence of the reorganisation of the states on linguistic basis in 1956. The state was named believably after the Ahoms who ruled a large part of Brahmaputra valley for over six centuries, from early thirteenth century to the end of the first quarter of the nineteenth century. The British retained this name for an extended territory, far beyond the territory held by the Ahoms and the Assamese-speaking area. In pre-1947 British Assam, just around 22 % of the population spoke Assamese, as their mother tongue, while Bengali was spoken by 43 % of the population. The situation is now vastly changed after 1947. With the transfer of the most thickly populated Bengali-speaking district of Sylhet to Pakistan (now Bangladesh), the proportion of Assamese-speaking population rose to around 55 %. A subsequent relative decline to around 48 % is largely attributed to influx of Bangladeshi immigrants as well as people from other parts of India. Though Assamese is the official language, the change from English to Assamese has not been smooth. The tribal population like the Dimasas, the Karbis and the Bodos have not accepted Assamese unequivocally, and the secession of Meghalaya from the parent state of Assam can be attributed to the language policy of the state as

enunciated in the Official Language Act (XXIII-1960). Under this Act, Assamese was made the official language for Assam valley districts and Bengali in Cachar, while the languages of the hills were to be decided by the District Councils (Barpujari 1998). Following this Act, the Khasis and the Garos separated from Assam and a new state of Meghalaya emerged.

The Bodos, the largest tribal group of the state, also revolted and not only succeeded in obtaining for Bodo the status of a scheduled language but also the right to school education in their own language.

The tribes and their languages go together. Most tribes have their own language without a script but guard their language jealously without succumbing to the onslaught of Assamese or other scheduled languages. At best, they adopt Assamese, the lingua franca of the state, to be able to participate in the socio-economic activities and other services outside their community.

The loyalty of several linguistic groups to their mother tongue and reluctance to accept Assamese in preference to their own language have created a situation where some tribal groups demand a separate state of their own or at least some kind of territorial autonomy. The demand for Bodoland is a case in point where the Bodo-speaking Bodo tribes demand Bodoland, a separate state of their own. It is observed that some of these linguistic groups don't hesitate to resort to some kind of ethnic cleansing to claim sole possession of a territory. This is especially so where a specific linguistic tribe has a majority in the district. Today, Assam has, besides two official languages, Assamese in Brahmaputra valley and Bengali in Barak valley, a medley of nonscheduled languages patronised by different tribal groups.

To reconcile conflicting viewpoints, an administrative approach based on a reasoned understanding of the grievances and the operations of different linguistic and tribal groups may help solve the problem.

References

Allen BC (1901) Census of India, vol VI, Assam, pt II, tables p 9 (for religious composition of Lushai Hills), Shillong

Allen BC (1905) The gazetteer of Naga Hills and Manipur. Assam District Gazetteers, vol XI, Shillong

Banerjee S (2004) Pnar social structure. In: Basu A, Dasgupta BK, Sarkar J (eds) Anthropology for North-East India: a reader. IAA, Kolkata

Banthia JK (ed) (2001) Census of India 2001. First report on religion. Government of India

Bareh H (1964) Khasi democracy. Don Bosco School, Shillong

Bareh H (1967) History and culture of Khasi people. Shillong

Barkataki S (1969) The tribes of Assam. NBT, Delhi

Barpujari HK (1998) North East India: problems and prospects. Spectrum, Delhi

Barua KL (Rai Bahadur) (1933) Early history of Kamarupa from the earliest times to the end of the 16th century. Shillong (published by the author), 2nd edition in 1966 published by Lawyers Book Depot, Guwahati

Barua BK (1951) A cultural history of Assam. Nowgong, Barooah, p 4

Baruah TKM (1960) The Idu Mishmis: the people of NEFA (North-East Frontier Agency). Govt. of Assam, Shillong, 110 p

Baruah AK (1991) Social tensions in Assam – middle class politics. Purbanchal Prakash, Guwahati, p 37

Bhagabati AC (2003) Structure and change in Arunachalee society: some observations: In: Goswami P (ed) Insight: a collection of articles. XXIV Session. NEIHA, Gauhati University, Guwahati, pp 142–146
Bhagabati AC (2004) The tribe as a social formation: the case of Tangsa of Arunachal Pradesh. In: Arabinda B et al (eds) Anthropology for North-East India: a reader. Indian National Confederation and Academy of Anthropologists, IAA, Kolkata
Bhattacharjee PN (1983) The Jamatiyas of Tripura. Government of India, Agartala
Bhaumik S (1996) Patterns of minority violence in North-East India. quoted from N Das (2002) Regionalism, ethnicity and nationalisation in North-East India. In: Joshua Thomas C (ed) Dimensions of displaced people in North-East India. Regency, Delhi
Bose ML (1989) Social history of Assam. Concept, New Delhi
Butler (Capt) J (1875) Rough notes on Angami Nagas. JASB 44(pt IV):307–346
Cantlie A (1984) The Assamese. Centre of South Asian Studies, University of London, London
Carey BS (1896) The Chin Hills: a history of people, British dealings with them, their customs and manners and a gazetteer of their country. Cultural, Delhi, Reprinted 1983
Census of Assam (1881) The province of Assam under the jurisdiction of the Chief Commissioner (Chief Secretary C. J. Lyall) castes and tribes, Report. Supdt. Govt. Printing Press, Calcutta 1883, pp 63–64
Census of India (1911) Bengal, Bihar, Orissa and Sikkim, vol V, pt I, Report, p 257, Calcutta
Census of India (1931) Assam, vol III, part II, tables, pp 261–270 (The 1931 Census of Assam also offers an explanatory note titled 'On some castes and caste origin in Sylhet' authored by Prof. K. M. Gupta of Murarichand College, Sylhet attached as appendix C, to part I-A), Shillong
Census of India (1991) Language atlas of India, New Delhi
Census of India (2001a) Assam, Series 19 – primary census abstract – Assam Tables A5, A6, A7, A8, A9, Scheduled Castes and Scheduled Tribes Orders (Amendment) Act 1976, Guwahati
Census of India (2001b) State primary census abstract for individual tribe – 2001, A-11, New Delhi
Census of India (2001c) Scheduled tribe atlas of India, New Delhi
Census of India (2001d) India – languages, states and union territories, Series 1, table C/16, p 28, New Delhi
Chatterjee SK (1950) Kirata Jana Kriti, the Indo-Mongoloids: their contribution to the history and culture of India. J R Asiat Soc Bengal 16(2):22, Calcutta
Chatterjee SK (1955) The place of Assam in the history of civilisation of India. Banikant a Kakati memorial lectures 1954. University of Gauhati, Guwahati
Chaudhuri NC (1965) The continent of Circe. Jaico Books, Mumbai
Choudhury PC (1987) History of civilisation of the people of Assam to the 12th century A.D. Ph.D. thesis, London University, published subsequently, Spectrum, Guwahati
Dalton, ET (1872) Descriptive ethnology of Bengal. Asiatic Society of Bengal Press, Calcutta. Reprinted 1973 by Cosmo Publication, Delhi
Damant GH (1880) Notes on the locality and population of the tribes dwelling between Brahmaputra and Ningthi rivers. JRAS 12:228–259
Danda DG, Danda AK (2004) On Dimasa descent system. In: Basu A et al (eds) Anthropology for North-East India: a reader. Special Publication of the Indian National Confederation & Academy of Anthropologists, Kolkata, pp 140–151
Das BM (1981) Microrevolution. Concept, Delhi
Das BM (1987) The people of Assam. Gyan, Delhi
Das G (2002) Immigration in North-East India: The security dimension. In: Joshua Thomas C (ed) Dimension of displaced people in North-East India. Regency, Delhi, p 80
Das BM (2008) Ethnic elements in North-East India. In: Sengupta S (ed) Peoples of North-East India: anthropological perspectives. Gyan, New Delhi
Debbarma K (2002) Internationally displaced persons in Tripura. In: Joshua Thomas C (ed) Dimension of displaced people in North-East India. Regency, Delhi
Dixon RB (1922) The Khasis and the racial history of Assam. Man in India 2:1–11
Dubey SM (1972) Education, social change and political consciousness among the tribes in North-East India. In: Singh KS (ed) The tribal situation in India. IIAS, Shimla, pp 280–293

Dunn EW (1886) Gazetteer of Manipur. Manas, Delhi, Reprinted 1992
Dutt KN (1979) Assam district gazetteer: Karbi Anglong and North Cachar Hills. Govt. of Assam, Guwahati
Dutt KN, Dutta NC (eds) (1976) Gazetteer of Lakhimpur and Dibrugarh. Assam State Gazetteers, Govt. of Assam, Gauhati
Elwin V (1964) The tribal world of Verrier Elwin: an autobiography. Oxford University Press, New York/Bombay
Endle, S (rev) (1961) The Kacharis. Macmillan, London. Reprinted by Cosmo Publication
Gait EA (1906) A history of Assam. Thacker, Spink & Co., Calcutta. Reprinted 2006, LBS, Guwahati
Godden GM (1897) Nagas and the frontier tribes of North-East India. J R Anthropol Inst 26:161–201
Gopalakrishnan R (1995) Meghalaya: land and its people. Osmons, Delhi
Goswami PC (1984) The migration of Bengali Muslims. In: Abbi BL (ed) Northeast region: problem and prospects of development. CRRID, Chandigarh
Goswami MC, Majumdar DN (2004) Clan organization among the Garos of Assam. In: Arbinda B, Dasgupta BK, Jayanta S (eds) Anthropology for North-East India: a reader. IAA, Kolkata, pp 129–139
Grierson GA (1903) Linguistic survey of India. Tibeto-Burman Family, Bodo, Naga and Kachari Groups, vol III, pts. 1, 2 and 3. Reprinted 1967, Motilal Banarsidass, Delhi
Grierson GA (1905) Linguistic Survey of India. Mon Khmer family vol II, 1. Reprinted 1967, Motilal Banarsidass, Delhi
Gundevia YD (1975) War and peace in Nagaland. Palit & Palit, Dehradun
Gurdon (Lt. Col.) PTR (1914) The Khasis. Macmillan, London
Hodgson B (1847) First essay on the Kocch, Bodo and Dimal Tribes. Baptist Mission Press, Calcutta
Hunter WW (1881) Imperial Gazetteer of India, vol IV. Trubner & Co., London
Hutton JH (1921a) The Angami Nagas with some notes on neighbouring tribes. Macmillan & Co., London, Reprinted OUP
Hutton JH (1921b) The Sema Nagas. Macmillan, London
Kar KK, Barua G (1979) Tea labour: preliminary appraisal of common identity in multi-ethnic community in Assam. Man in India 59(1):33–42
Karna MN (2005) Meghalaya. In: Mayumi Murazava, Kyoko Inoue and Sanjoy Hazarika (eds) Subregional relations in the Eastern South Asia with special Focus on India's North-Eastern Region, Tokyo, pp 243–276
Kuhn E (1889) Beiträge zur Sprachenkunde Hinterindiens. Sitzungsberichte d. k. bayr. Akademie d. Wissenschaften, pilosoph. philol. Cl. part 2 190–236, Munich
Kyndiah PR (1990) Meghalaya: yesterday and today. Har-Anand, New Delhi
Kyndiah PR (1994) Mizo freedom fighters. Sanchar, Delhi
Lalkhama (2006) A Mizo civil servant's random reflections. Express Print House, Ghaziabad, 368 pp
Lyall C (1908) The Mikirs, from the papers of the late Edward Stack, IES (edited, arranged and supplemented). D. Nutt, London. Reprinted, United Publishers, Guwahati
Mandal H, Mukherjee S, Datta A (2002) India: an illustrated atlas of tribal world. Anthropological Survey of India, Kolkata
Mankekar DR (1967) On the slippery slopes of Nagaland. Manaktales, Bombay
Menon KD (1975) Tripura district gazetteer. Government of India, Agartala
Mukerji B, Singh KS (1982) Tribal movement in Tripura. In: Singh KS (ed) Tribal movement in India, vol I. Manohar, Delhi
Mullan MA (1931) Caste, tribe, race and nationality. Census of India, vol 3, Assam, pt. I, Report, Appendix to Chapt. XII, p 201, Shillong
Nayak DK, Patra A (2003) Ethnic conflict and forced migration in the area of Bodo concentration in Assam, India. TIIG 25:30–48
Nisar A, Ali I (1979) Hindu–Muslim relations in Assam. Man in India 59(4):361–382
O'Donnel CJD (1893) Lower provinces of Bengal and their feudatories, Census of India 1891, vol IV, Administrative Table, caste tables, p 12, Calcutta

O'Malley LSS (1911) Bengal, Bihar, Orissa and Sikkim, Census of India, vol V, pt I, Report p 117, Calcutta
Olivier G (1958) Physical anthropology of the Nagas of Assam. Man in India 38(2):105–110
Pachuau L (1991) Population structure and settlement patterns in Mizoram. Unpublished Ph.D. dissertation, NEHU, Shillong
Playfair A (1909) The Garos. David Nutt, London
Pudaite LT (2005) Mizoram. In: Murayava M, Inoue K, Hazarika S (eds) Sub-regional relations in the Eastern South Asia with special focus on India's north-eastern region, IDE-JETRO, Joint Research Program Series No. 133, Institute of Developing Economies, Chiba, pp 155–242
Rongumuthu DS (1960) The epic lore of the Garos. Department of Tribal Culture and Folklore Research, University of Gauhati, Guwahati
Roy Burman BK (2004) Christianity and development among the hill tribes of North-East India. In: Basu A et al (eds) Anthropology for North-East India: a reader. Spl. Publ., IAA, Kolkata, pp 73–87
Saha RK (2004) Ecology in Time and space: structural transformation among the Meiteis of Manipur Valley. In: Basu A et al (eds) Anthropology for North-East India: a reader. IAA, Kolkata
Saha A (2005) Tripura: In: Murayava M et al (eds) Subregional relations in the eastern South Asia with special focus on India's north-eastern region. IDE-JETRO, pp 301–320, Tokyo
Sarma SN (1981) Social changes in Assam – 1750 to 1950. J Univ Gauhati 28–29:109–121
Shakespear (Col.) LW (1914) History of upper Assam, upper Burma and north-eastern frontier. Macmillan, London
Singh KS (1978) Bio-anthropological study of three populations in Manipur valley. Ph.D. thesis, Pune University
Singh KS (ed) (1998) People of India. National series, vol VI, Indian communities. ASI, Kolkata
Singh KS (1994 onward) The scheduled tribes of India. National series, vol III. ASI, Kolkata; Oxford University Press, New Delhi
Sinha R (1962) The Akas. Research Department, Adviser's Secretariat, Shillong
Sinha R (1977) Religion and culture of North-East India. Abhinav, New Delhi
Stack E (1908) The Mikirs (edited, arranged and supplemented by Sir Charles Lyall) from the Papers of late Edward Stack. United, Guwahati
Suri R (1985) Physical anthropology of Angami Naga. A tribe of North-East India. Ph.D. dissertation, Gauhati University
Thane GD (1882) On some Naga skulls. J R Anthropol Inst 11:215–18
Thompson WH (1923) Census of India 1921, Bengal, pt I, Report Ben. Sec. Bk. Depot, Calcutta, p 162
von Fürer-Haimendorf C (1946) Agriculture and land tenure among the Apatanis. Man in India 26(1):20–49
Waddell LA (1900) The tribes of the Brahmaputra Valley. JASB 69(3):1–127
Wangshimenla (2002) Environmental ethics, social norms and land use practices in Ao region, Nagaland. Ph.D. dissertation, Nagaland University, Lumani
Woodthorpe (Lt Col) RG (1882) Notes on the wild tribes inhabiting the so-called Naga Hills on our North-East frontier of India. J R Anthropol Inst 11(Pt I): 56–74; Pt II:196

Chapter 12
Population of the North-Eastern States of India

Abstract North-East India, comprising the seven states, has a population of over 45 million, which is 3.76 % of India's population. The overall density of population is 159 persons/km^2, though Assam, the principal state of the region, has a population density of 397 persons to a km^2. In contrast, the state of Arunachal Pradesh, occupying the foothills of the Himalayas, has an average density of 17 persons to a km^2. The distribution of population is highly irregular that reflects the sequent of occupancy, the agricultural potential of a state and the ruggedness and accessibility of the terrain. The most densely populated parts of the region are the plains of Brahmaputra and Barak, the Imphal plain in Manipur and the western part of Tripura.

The mid-twentieth century was a demographic watershed in the population growth of Assam, as much as for the rest of India. While the population of Assam grew by just 55 % over a period of half a century between 1901 and 1951, the accelerated growth after 1951 resulted in a population growth of 288 % between 1951 and 2001. During the same period, the population of North-Eastern region as a whole grew four and a half times showing an increase of 350 %. The region has around 27 % indigenous people in its population, recognised by the Indian constitution as Scheduled Tribes or STs. The sex ratio of the region is 954 females per 1,000 males, slightly above the national average of 940 females per 1,000 males. The literacy rate in different states is variable, the highest being in Mizoram which has enumerated 93 % of its population as literate in contrast to Arunachal Pradesh which has recorded only 67 % of its population as literate. During the last four decades, birth as well as death rate has declined. A steep decline in birth rate has led to a decline in growth rate, despite the decrease in death rate. The highest decadal growth rate was between 1971 and 1981, but it has come down to 1.7 % in 2011, a figure that corresponds to the population growth rate for India.

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The population of North-East India or, for that matter, any other state is essentially the picture of the numerical strength of the people in a specific area, as it varied over time and space, in density, growth, composition and several other attributes, which, in a large measure, determine the qualitative strength of the population. The North-Eastern states of India (Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Tripura – the original seven states – to which Sikkim was added in 1975, making it a conglomerate of eight states) have a total population of 45,588,381 that accounts for 3.77 % of the population of India (Table 12.1). The region as a whole is sparsely populated and shows wide contrasts in its ethnic composition and density pattern as reflected in the population density of Assam and Tripura, which show a density of population comparable to the country as a whole (Fig. 12.1).

The North-Eastern region, taken as a block of eight states, has a population density (159 persons/km^2) that is even less than half the national average of 382 persons/km^2. The picture is understandably deceptive as some individual units (states) show extremes of higher and lower density of population, related to their resource endowment and historical antecedents (Table 12.2). The overall density of 159 persons/km^2 for the North-East region is one of the lowest in India and comparable to Uttarakhand (189 persons/km^2), Jammu and Kashmir (124 persons/km^2), Himachal Pradesh (123 persons/km^2) or the forested regions of Chhattisgarh with a population density of 189 persons/km^2. A population density of 159 pales into insignificance when compared with high-density areas of India like Bihar, W. Bengal and Kerala with a population density of 1,102, 1,029 and 859 persons/km^2, respectively. Arunachal Pradesh, a very sparsely populated state, with a density of 17 persons/km^2 occupies one extreme of population density with Assam having a population density of 397 persons/km^2 at the other end. An intra-regional contrast in population distribution in relation to the area gives a better picture (Fig. 12.2).

The two riverine states of Assam and Tripura together account for more than three-fourths of the total population of the North-East region with only 33.7 % of

Table 12.1 Area and population of North-Eastern states in comparison with India (2011)

Administrative units	Area (km^2)	Area as % of the area of India	Population 2011	As % of the population of India	Density/km^2 2011
India	3,287,263	100 %	1,210,193,422	100 %	382
Arunachal Pradesh	83,743	2.547	1,382,611	0.114	17
Assam	78,438	2.386	31,169,611	2.576	397
Manipur	22,327	0.670	2,721,756	0.225	122
Meghalaya	22,429	0.682	2,964,067	0.245	132
Mizoram	21,081	0.641	1,091,014	0.090	52
Nagaland	16,579	0.504	1,980,602	0.164	119
Sikkim	7,006	0.213	607,688	0.050	86
Tripura	10,486	0.318	3,671,032	0.303	350
NE region	**263,179**	**8.006**	**45,588,381**	**3.767**	**159**

Source: Census of India (2011), Provisional Population Totals. Pt. 1, for all states

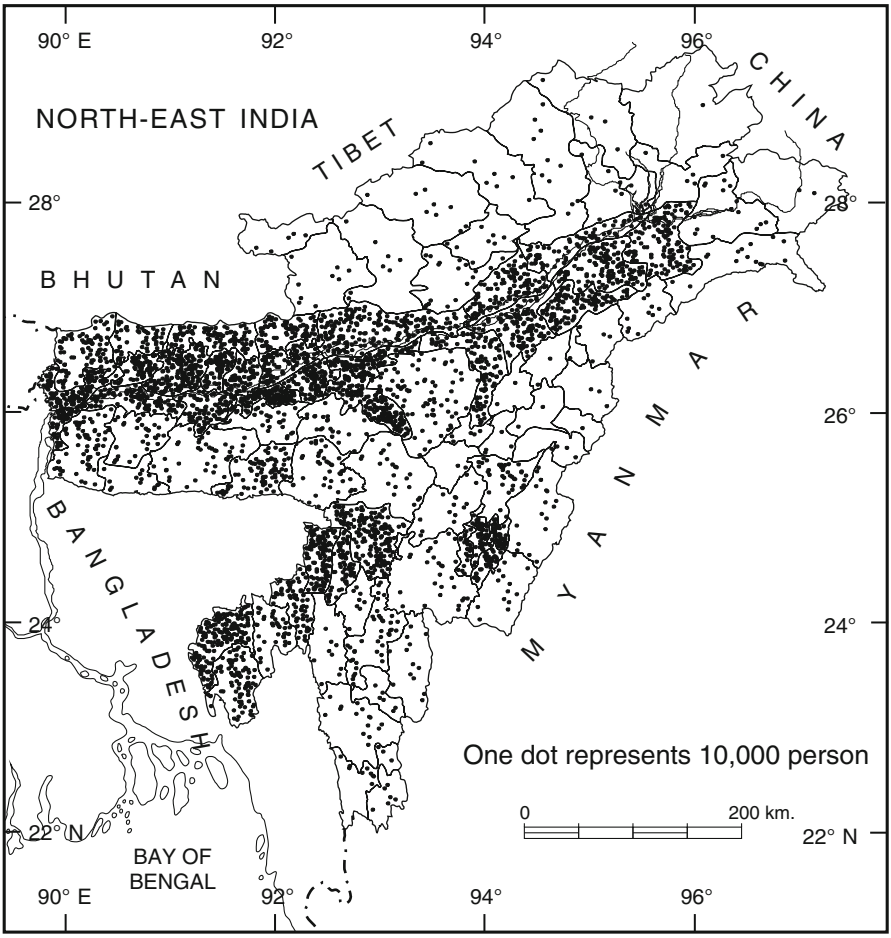

Fig. 12.1 Population distribution in North-East India – 2011 (each *dot* represents 10,000 persons)

the area. The former is formed largely by the Brahmaputra and Barak river plains, and the latter is partially an eastward extension of the Bengal delta. The hilly and dissected terrain of Arunachal occupying almost one-third of the territory of the North-East region, extending from 20 to 50 km north of the Brahmaputra, reaching the Himalayan heights and forming the main Indo-Tibetan boundary, is the most sparsely peopled part of the country. Mizoram with hardly any plain to support a larger population and Sikkim with its mountains and severe winters have not proved congenial to the growth of population. Mizoram, Sikkim, Manipur and Nagaland are other states besides Arunachal Pradesh that have remained sparsely populated.

Table 12.2 Population distribution in North-East India in relation to the area (2011)

States	Area of the state (km^2)	Area of the state in % of the area of the North-East	Population of the region 2011	Population of the state as % of the population of the NE region
North-East region	263,179	100 %	45,588,381	100 %
Arunachal Pradesh	83,743	31.80	1,382,611	3.03
Assam	78,438	29.80	31,169,611	68.37
Manipur	22,327	8.48	2,721,756	5.97
Meghalaya	22,429	8.52	2,964,067	6.50
Mizoram	21,081	8.01	1,091,014	2.39
Nagaland	16,579	6.29	1,980,602	4.35
Sikkim	7,006	2.66	607,688	1.33
Tripura	10,468	3.97	3,671,032	8.05

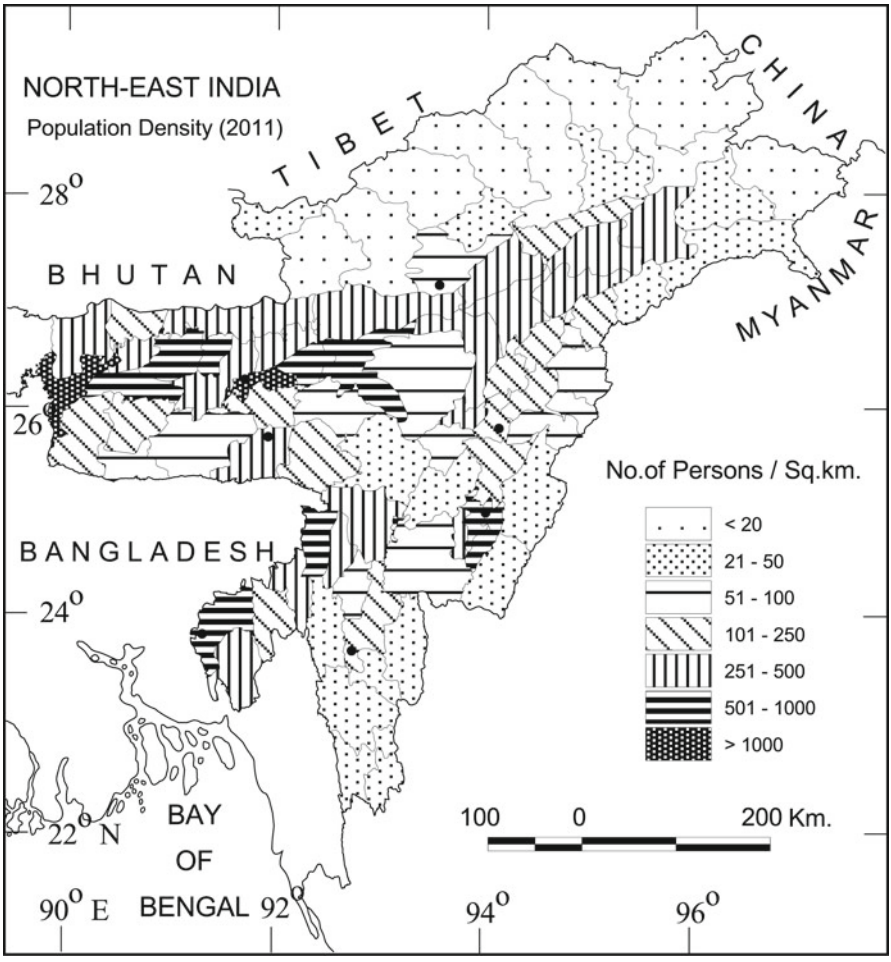

Fig. 12.2 Density of population in North-East India shown at district-level of aggregation (2011)

12.1 Distribution and Density of Population

A very generalised picture based on states averages could be misleading and has to be examined in the light of sub- and micro-regional conditions.

12.1.1 Population Density in Assam

Assam, essentially comprising the Brahmaputra and Barak valleys, contributes the largest share of population of the North-East region. It accounts for more than two-thirds (68.4 %) of the population of the region with not even one-third (29.8 %) of the area. The narrow alluvial plain of Brahmaputra, from Tinsukia on the east to Kokrajhar on the west, a stretch of about 700 km with a maximum width of 80 km, is the most densely populated region in the North-East, with a density of 400 persons/km^2. This is also the most productive region agriculturally and is the home to the Tinsukia–Digboi–Dibrugarh industrial area of the state, besides having extensive tea plantations in upper Assam. Also, the largest urban centres of the region Guwahati, Jorhat and Dibrugarh are located in this region. The southern region of Assam, south of the Barail range, drained by the Barak river and divided into three districts of Cachar, Hailakandi and Karimganj, has a relatively high density of population. Karimganj, on the border of Bangladesh, has a population density of over 600 persons/km^2. The lower Barak basin is a physiographic extension of Bangladesh, the Ganga–Brahmaputra delta. The only districts of Assam that have a density of less than 100 persons/km^2 are the hilly districts of Karbi-Anglong and Dima Hasao (North Cachar). These districts are hilly and forested with poor agricultural productivity. Ranging in height from 500 to 1,000 m and confined between the two towns of Lumding in the north and Haflong in the south, it is an old gneissic block, rocky and devoid of fertile alluvium that could support rich agriculture.

Most districts of Assam have a population density of 350 persons/km^2 with some like Kamrup (436 persons/km^2), Nagaon (711 persons/km^2), Barpeta and Marigaon having a population density of over 600 persons/km^2. Some districts like Dhemaji, occupying the right bank of Brahmaputra in the North-East, suffer from marshy conditions repelling population and showing a population density as low as 213 persons/km^2.

12.1.2 Population Density in Manipur Plain

Other areas beyond Assam and the valleys of Brahmaputra and Barak that show clusters of villages and high-density population are the districts of Manipur valley (Imphal valley) and the western part of Tripura, which again is an extension of the Bengal delta. The Manipur plain, also known as the Imphal plain, an alluvium-filled tectonic depression, a featureless flat plain, covered by four districts, viz. Imphal West, Imphal East, Bishnupur and Thoubal, supports 61 % of the state's population with

10 % of the area of Manipur state. Imphal West and East, the two districts of Manipur, have an exceptionally dense population, the former having a population density of 992 persons to a km^2 and the latter a slightly lower density of 638 persons/km^2. Imphal West, the district centred around Imphal town, the capital of Manipur, has the highest density of population in the North-East region, comparable to West Bengal and Kerala. West Tripura, with Agartala, the state capital, has a density of over 300 persons/km^2.

12.1.3 Population Density in Arunachal Pradesh

The rest of the North-East region, being hilly, forested and deeply entrenched by valleys, with the exception of the Meghalaya plateau, is devoid of productive terrain and consequently dense population distribution. The most sparsely settled region in the North-East is Arunachal Pradesh. With an overall density of 17 persons/km^2, some districts like Dibang Valley and Upper Siang have a population of 4–5 persons/km^2. Dibang valley, lying in the extreme North-East corner of Arunachal, the largest district of the state is the most sparsely populated district of the state. The population and the settlements in Arunachal are tethered to the north–south flowing rivers, like Dibang, Siang, Subansiri and Kameng and their tributaries. The sparse population becomes further sparse as one moves closer to the Indo-Tibetan border, where the settlements are located far apart sticking to the riverside. In fact, sometimes for tens of kilometres there are no settlements and no population. One-third of the population of the state is concentrated in the three eastern districts, viz. Changlang, Tirap and Lohit. The western hilly part of the state, formed by Kameng and Tawang districts, carries some towns like Tawang and Bomdila, but these have not added much to the population density. Much of the population of Arunachal is confined to the southern and eastern part of the state, oriented to river valleys that also provide the routes for laying roads.

No other part of India is so sparsely populated as Arunachal Pradesh.

12.1.4 Population in the Eastern Mountainous Region

The eastern hilly region comprising Nagaland, Manipur and Mizoram has hardly any concentration of population except in the Imphal valley described above. Nagaland has a population density of 120 persons to a km^2 with the northern parts of Mon and Mokokchung showing an above-average density of population. Dimapur in the southwest has the highest density in the state, supported by a productive agricultural base of Dhansiri river and the well-established urban centre of Dimapur that controls the transport and warehousing of goods moving along the national highway no. 39. Less accessible higher eastern part of Nagaland rising to a height of over 3,500 m ASL as at Saramati, constituted by the two districts of Tuensang and Phek, has a density of population of less than 100 persons/km^2.

Manipur with its mountainous rim and the central Imphal plain presents a study in population density contrast, determined exclusively by agricultural support base.

The mountainous region of much of the north, west and east Manipur state, comprising the districts of Senapati, in the north, Tamenglong in the northwest, Churachandpur in the southwest and Ukhrul and Chandel in the east, has a very low density of population, with 109, 32, 59, 40 and 43 persons/km^2, respectively, whereas the districts of central Imphal plain are constituted by the districts of Bishnupur, Thoubal, Imphal West and Imphal East, which have a population density of 485, 818, 992 and 638, respectively. This imbalance in population density is seen in the crowding of the population in the extended Imphal plain with 60 % of the total population of Manipur state with only 10 % of the area. The 90 % of the area, formed by the mountainous ranges, has only 40 % of the population of the state.

The divide between the mountainous rim and the plain is also the divide between the tribal and non-tribal population in Manipur. The tribal population is overwhelmingly confined to the mountainous fringe, whereas the non-tribal population is largely centred in the plain. Another important demographic feature of Manipur is the presence of people classed as Scheduled Caste, not found in other hilly region like Nagaland and Mizoram where their presence is only notional. This clear-cut spatial division of the tribal and non-tribal population has created a situation of conflict, where the tribal population, largely composed of Nagas, aspires to be independent of the Imphal valley where they have a minimum stake and would like to join their ethnic counterpart in Nagaland.

Next to Arunachal, Mizoram is very sparsely populated, the overall density being 52 persons/km^2, with some districts like Lunglei and Lawngtlai in the central southern part of the state showing a population density as low as 34 and 46 persons to the km^2 respectively. Aizawl, the capital of the state, has attracted a larger population, accounting for over one-third of the population of the state. Mizoram with a population of just over a million, with half the population living in two settlements classed as urban, is agriculturally the least productive of the states of the North-East. It has a geological structure that has produced sharp-crested north–south ridges and deep valleys with very limited scope for regular agriculture and depends almost exclusively on shifting cultivation practised on the hill slopes.

12.1.5 Population Density in Meghalaya

Meghalaya, with a population of nearly three million, has a population density of 132 persons to the km^2. For long, though a part of Assam, it remained detached from the Brahmaputra valley, firstly because of its height, 1,500 m above the Brahmaputra valley, and thus maintaining a separate physiographic entity, but equally because of the composition of its population consisting of a few ethnic groups, like the Khasis, Jaintias and Garos which maintained a cultural identity independent of the population of Assam valley. The region, despite having the seat of administration at Shillong for the entire North-East region for over 75 years, did not attract much population because of the hilly terrain, poor soil and high rainfall. Besides, any increase in population because of immigration remained confined to Shillong. Thus, between the two densely populated alluvial plains of

Brahmaputra in the north and Surma in the south, Meghalaya, known earlier as Shillong Plateau, remained thinly populated.

The state has an overall density of 132 persons to a km^2, not very dissimilar from Nagaland and Manipur. Much of the plateau has an overall density of less than 100 persons/km^2, with the exception of East Khasi Hills, centred around Shillong. With all the administrative and other public institutions located there, East Khasi Hills has a population density of 292 persons/km^2. Similarly, West Garo Hills, occupying the western part of the plateau, shows an above-average density of population largely because of the low relief which merges with the Brahmaputra plain with better agriculture and partly because of Tura town, the administrative seat of Garo Hills district and the traditional seat of Garo chiefs.

12.1.6 Tripura

The most interesting state in the North-East from the point of view of population distribution and density is *Tripura*, a small state of 10,486 km^2, formerly a princely state. The state has a density of 350 persons/km^2. A low density of population in the eastern hilly part is compensated by a high density in the western region adjacent to Bangladesh. Thus, while hilly Dhalai district has population density of 150 persons/km^2, West Tripura plain has 976 persons/km^2. Like Assam, Tripura has a majority of non-tribal population (over 70 %) and a significant percentage of Scheduled Caste population (17.39 %) largely concentrated in the plains of West and South Tripura. This percentage is higher than Assam which has only 6.8 % of Scheduled Caste population. Two things account for it; the first is the intensity of agriculture in western Tripura and the second is the traditional community structure of Hindu society that was established in Tripura centuries ago.

To summarise, much of the population of the North-East region of India is contained in the two states of Assam and Tripura, both of which have a high density of population, particularly in the alluvial plains. These two states with one-third of the total area of the North-East region accommodate 76 % of its population. The rest of the region with the sole exception of Manipur plain, centred around Imphal, has a low to very low density of population, varying from 17 persons for Arunachal to 52 for Mizoram, 120 for Nagaland, 122 for Manipur and 132 for Meghalaya. Of the total population of the North-Eastern region, about 27 % is composed of Scheduled Tribes, and Scheduled Caste population numbers a little over 6 %. A detailed account of regional communities is given in Chap. 11.

12.2 Population Growth in the North-East Region from the Late Nineteenth Century till 2011

The earliest demographic record of North-Eastern region of India or, for that matter, the entire country is available since 1871, when the Government of India finalised the *Memorandum of the Census of British India*, for its first regular census

Table 12.3 Area, villages and population in Assam (1871–1872)

Districts	Area (km^2)	No. of villages and towns	Population	Density of population/km^2	No. of persons/ villages
1. Sylhet	13,941.9	5,589	1,719,539	123.30	308
2. Cachar	3,328.1	389	205,027	61.60	527
3. Cachar Hills	9,621.8	No census taken			
4. Kamroop	9,404.3	1,649	561,681	54.08	341
5. Durrung	8,839.6	187	236,009	59.73	1,723
6. Nowgong	9,448.3	1,293	256,390	27.13	198
7. Seebsagar	6,249.6	203	296,589	47.45	1,461
8. Luckimpour	8,145.5	125	121,267	14.88	970
9. Luckimpour Hills	21,608.3	No census taken		8.90	–
10. Naga Hills	12,691	–	68,918	5.43	–
11. Cossya and Jyntea Hills	15,946.6	–	141,836	8.89	–
12. Goalpara	11,481.4	1,330	444,761	38.73	334
13. Garo Hills	8,780.1	–	80,000	9.11	–
Assam	**139,486.5**	**10,715**	**4,132,019**	**36.19**	

1. Memorandum of the Census of British India (1875)
2. The area given in square miles is converted into square kilometres by multiplying it by 2.58999
3. Mizoram (Lushai Hills) was not a part of British India in 1872
4. Arunachal, the erstwhile NEFA is partly represented here in Luckimpour Hills
5. Manipur and Tripura are princely states in 1971

in 1881. Though brief and partial, this Memorandum gives a picture of the population distribution and density as these existed 140 years ago. The Memorandum of the Census published from Her Majesty's Stationary Office, London, in 1875, carries some appendices, which incorporate several tables giving some basic numerical information about area, settlements, population and density of the states, then forming a part of British India.

According to that report, Assam in 1871–1872, with 13 districts which also included Naga Hill district (now part Nagaland) and districts of Cossya and Jyntea Hills (Khasi and Jaintia Hills) and Garo Hills and 10 other districts, had a population of 4,132,019, distributed over 10,715 villages and towns, showing a density of 32 persons/km^2 (Table 12.3).

The religious composition of the population of Assam in 1871, when Sylhet, part of Nagaland then known as Naga Hills district, and the districts of Meghalaya were parts of Assam, was very different from today. About a fourth of the population comprised Muslims (26.7 %), and the Hindus formed 70 % of the population of the state, with 34.89 % pure Hindus and 36 % aboriginal and semi-Hinduised Hindus. No district had a population density of over 100 except Sylhet, which had a population density of 123 persons/km^2. Even Kamrup and Goalpara, in the alluvial tract of Brahmaputra, were thinly populated.

From 1870 till the end of the nineteenth century, there were a number of territorial changes made in the area of the state as well as the districts, but the area as a whole lingered around 50,000 sq. miles (130,000 km^2) which included 13 districts (1. Cachar, 2. Sylhet, 3. Garo Hills, 4. Goalpara, 5. Kamrup, 6. Darrang,

Table 12.4 Statement of area, population and settlements in Assam province (1871–1901)

Year	Area of Assam province (in sq. miles)	Population of the province	Density of population per sq. mile	No. of settlements	No. of settlements per sq. mile
1871[a]	53,856	4,132,019	99.00	10,715	0.39
1881[b]	46,341	4,881,428	105.37	22,408	0.48
1891[c]	45,548	5,433,201	119.28	17,160	0.37
1901[d]	52,959	5,841,878	110.30	21,859	0.41

Sources:
[a]Memorandum of the Census of British India (1875)
[b]Report of the Census of Assam for 1881 (1883)
[c]Report on Census of Assam (1891, pt. II, Ch. 1, p. 57)
[d]Census of India 1901, vol. IV – Assam pt. II by B. C. Allen, Supdt. of Census Operations in Assam, Shillong, 1902, pp. 1–3

Table 12.5 Growth of population in Assam in the nineteenth century (1872–1901)

Districts	Population in 1872	Population in 1901	Percentage change
1. Cachar plains	205,027	414,781	102.00
2. Sylhet	1,719,539	2,241,848	30.37
3. Goalpara	387,341	462,052	19.03
4. Kamrup	561,681	589,187	4.89
5. Darrang	235,720	337,313	43.09
6. Nowgong	260,238	261,160	0.35
7. Sibsagar	317,799	597,969	88.15
8. Lakhimpur	121,267	371,396	206.25
9. N. Cachar Hills	30,000	40,812	36.04
10. Naga Hills	71,021	102,402	44.18
11. Khasi and Jaintia Hills	140,356	202,250	51.22
12. Garo Hills	100,780	138,274	37.20
Assam (excluding Manipur)	4,150,769	5,841,878[a]	40.70

[a]In the Census of Assam 1901, pt. II, table 2, the population of Assam for 1901 is given as 6.126 million which includes the population of Manipur, which is deducted to reach the figure of 5.84 million

7. Nowgong, 8. Sibsagar, 9. Lakhimpur, 10. North Cachar Hills, 11. Garo Hills, 12. Khasi Hills, 13. Naga Hills). The population varied between 4.13 million in 1871 and 5.84 million in 1901, ascribed largely to the addition of territory (Table 12.4). The density of the population varied between 100 and 120 persons per square mile (40–45 persons/km^2).

12.2.1 Growth of Population in Assam in the Nineteenth Century 1872–1901

The population of Assam grew from 4.15 million in 1872 to 5.84 million in 1901 (Table 12.5). This is partly ascribed to the addition of territory in Assam. Table 12.5

has ignored the figures as these appear in 1872 Memorandum and relies on the figures given in 1901 Census, as seen in table 2, page 2 of Census of Assam 1901, vol. IV, pt. II tables (by B C Allen).

It would be safe to conclude that the population of Assam increased by about 40 % over a period of three decades between 1871 and 1901, though this generalised picture is disturbed because of virtual stagnation of population in Lower Brahmaputra valley, viz. the districts of Kamrup, Nowgong and Goalpara, and a phenomenal increase in the population of Cachar plains, Lakhimpur and Sibsagar districts.

The Lower Brahmaputra valley including Nowgong, Kamrup and Goalpara did not show any increase despite the rice-producing fertile plain. These districts suffered severely from *kala-azar* in the last quarter of the nineteenth century, particularly between 1891 and 1901. Added to the evil effects of *kala-azar* that took a heavy toll of life, the severe earthquake of 1897 was also responsible for causing tremendous loss of life and property. On the contrary, the increase in the population of Lakhimpur and Sibsagar is attributed to the huge influx of workers, usually called 'coolies' who were engaged in tea plantations. After the discovery of indigenous tea in Brahmaputra valley in 1821, some of the earliest tea gardens were started in Lakhimpur district in 1835, and these exist till date. During the last three decades of the nineteenth century, the population of Lakhimpur district tripled and that of Cachar plains and Sibsagar almost doubled, all as a result of the huge influx of labour force for tea plantations from other parts of India. The local population of the province had abundant supply of wasteland that they could till and increase their income without back breaking hardwork in the plantations. A doubling of the population of Cachar plains in the last three decades of the nineteenth century, rather exceptional for that period, resulted from the migration of people from Bengal, as under the British rule they had unrestricted access to the less densely populated Lower Barak plains often to work on tea plantations.

The entire population of around six million (1901) was distributed unequally over 22,000 settlements, over 90 % of which were tiny villages with a population of less than 500 persons. The remaining 10 % lived in villages ranging in population from 500 to 2,000. The large villages with a population of over 2,000 were not more than 100, largely confined to the plains of Sylhet and Goalpara. There were about 20 towns in Assam in 1901, all but three having a population of less than 10,000 persons, and many had a population of less than 500 persons.

Golaghat and Jorhat both classed as towns had a population of 2,359 and 2,859, respectively. The largest towns in what is now contemporary Assam were Gauhati with a population of 11,661, Dibrugarh with 11,227 and Silchar with 9,250 persons. Shillong, by then the capital of the state, had a population of 8,384.

The largest town east of Dacca in India was Imphal with a population of 67,093. The towns described above had a very adverse sex ratio, the number of males being twice that of females in some cases (Table 12.6). The overall sex ratio in late nineteenth- or early twentieth-century Assam was 949 females per 1,000 males.

Table 12.6 Population and sex ratio of the towns of the North-East region in 1901

Town	Population 1901	Males	Females	Sex ratio females per 1,000 males
Silchar	9,256	6,575	2,681	408
Karimganj	5,692	3,470	2,222	640
Dhubri	3,737	2,670	1,067	400
Goalpara	6,287	4,198	2,089	498
Gauhati	11,661	7,772	3,889	500
Barpeta	8,747	4,221	4,526	1,072
Tezpur	5,047	3,568	1,479	415
Nowgong	4,430	2,659	1,171	666
Sibsagar	5,712	3,420	2,292	670
Jorhat	2,899	1,849	1,050	568
Golaghat	2,359	1,391	968	696
Dibrugarh	11,227	7,091	4,136	583
Kohima	3,093	2,174	919	422
Shillong	8,384	4,980	3,404	684
Imphal	67,093	32,965	34,128	1,035
NE region	**155,624**	**89,003**	**66,621**	**748**

Source: Census of India, 1901, vol. IV, Assam

12.2.2 Pattern of Population Distribution in Assam in the Early Twentieth Century

The population of Assam including Sylhet, now part of Bangladesh, and Manipur, now a separate state, was 6,126,343 in 1901, which produced a density of 42 persons/km^2. In the beginning of the twentieth century, Assam had 14 districts including the above two with an area of 145,663 km^2. The province included, then, more than half of present Nagaland, the eastern half remaining un-administered, the entire area of Mizoram, then known as Lushai Hills, and the districts of Meghalaya and Manipur. Of these, Sylhet alone with an area of less than 10 % of Assam accounted for more than a third of its population. Sylhet and the Cachar plains were the most densely populated districts, both occupying the fertile plain of Barak. These had a population density of 160 and 78 persons/km^2, respectively. At the other end of the density spectrum were the hilly districts of Lushai Hills (Mizoram), Naga Hills and Cachar Hills, which together spread over 23 % of the area of the province had only 3.68 % of its population. These least densely peopled hilly districts had a population density of 4.47, 9.20 and 9.96 persons/km^2, respectively, and presented a sharp contrast to the overall density of 42 for the province as a whole.

The mid-level density pattern was presented by the districts of Khasi, Jaintia and Garo, now constituting Meghalaya, and the districts of Brahmaputra valley. The Shillong plateau, then with almost an identical area to the contemporary Meghalaya, state had a population of 340,524, a seventh of what it was in 2001.

Table 12.7 Population density zones of Assam in 1901

Zone with districts	Area (km^2)	Zonal area as percentage of the area of the province	Population of the zone	Zonal population as percentage of the population of the province	Population (density/km^2)
Barak valley plain (Sylhet and Cachar plains)	19,440	13.40	2,656,629	43.36	136.60
Brahmaputra plain (Goalpara, Kamrup, Darrang, Nowgong, Sibsagar, Lakhimpur)	62,891	43.17	2,619,077	42.75	41.64
Meghalaya (Khasi and Jaintia, Garo Hills)	23,741	16.30	340,524	5.50	14.34
Eastern mountainous zone (Nagaland, Lushai Hills)	31,086	21.34	225,648	3.68	7.25
Manipur	8,505	5.84	284,465	4.65	33.44
Total	**145,663**	**99.9**	**6,126,343**	**99.99**	**42**

Source: Census of India, 1901, vol. IV, Assam

The two districts of the province, viz. Khasi and Jaintia Hills on the east and Garo Hills on the west, had population densities of 13 and 17 persons to a km^2, respectively.

The population in the Brahmaputra valley, Assam proper, with its six districts, viz. Goalpara, Kamrup, Darrang, Nowgong, Sibsagar and Lakhimpur, had a population of 2,619,077 (roughly 2.62 million), almost identical to the population of Sylhet and Cachar plains. The distinction lay in the density. While the two plain districts of Barak valley (Sylhet and Cachar) had a population density of 137 persons, with Sylhet having a density of 159 persons/km^2, the highest in the province, the districts of Brahmaputra plain had a population density of only 41.6 persons to a km^2. This, incidentally, also approximated the population density of the districts as a whole.

Thus, there were four population density zones in Assam in 1901 (Table 12.7).

1. A high-density zone of Barak plain
2. A medium-density zone of Brahmaputra plain
3. A moderately low-density zone of Meghalaya
4. A very low-density zone of the eastern hilly zone of Mizoram and Nagaland

Manipur, though included in Assam in 1901 Census was not strictly a part of Assam, as it was temporarily under the rule of the East India Company following the Manipur revolt, also known as Anglo–Manipur war, in 1891.

12.3 Population Growth in the North-East Indian States in the Twentieth Century (1901–2001)

The twentieth century witnessed a firmly established British rule in the North-East with two princely states, viz. Manipur and Tripura, permanently accepting their vassal status vis-à-vis the British crown. And, there were additional changes in the frontiers and in the territory of the province. The area of 'Naga Hills' district was enlarged, and additional areas of Sadiya, Balipara and Tirap frontiers were included in the British administrative territory. Thus, the area of Assam province including Manipur and the frontier area of Sadiya, Balipara and Tirap increased to 174,453 km^2 in 1941 and 220,172.5 km^2 in 1951 from 145,663 km^2 in 1901 showing an increase of over 50 %. The increase in area coupled with population growth, either natural or by immigration, resulted in increase in population (Fig. 12.3a, b).

The changes in the territorial organisation of North-East India were far more radical after India attained independence in 1947, creating new states out of the existing ones, based on language, ethnicity, regional sentiments and administrative convenience. New states like Mizoram, Nagaland, Meghalaya and Arunachal Pradesh emerged on the scene, adjacent to and carved out of the former province of Assam. Sylhet, a district in Assam, was merged into Eastern Pakistan (now Bangladesh), and the princely states of Manipur and Tripura were ceded to the Indian Union as separate states. This also resulted in the population migration and a shift in the demographic structure. Large-scale migration from the adjacent territory of erstwhile Pakistan changed the religious, ethnic and linguistic composition of population in some parts of the North-East, principally Assam.

In order to discuss the impact of these changes, the twentieth-century population study of the North-East is divided into two periods – a colonial or pre-independence period ending in 1947 and a period following the colonial period, coinciding with the latter half of the twentieth century.

12.3.1 Population Growth of Assam During the First Half of the Twentieth Century (1901–1951)

Assam during the first half of the twentieth century coincided largely with the present-day North-East India. The district of Sylhet, now in Bangladesh, formed part of Assam then, but the eastern part of the present-day Nagaland and part of Arunachal Pradesh were not fully administered and hence excluded from the census. Assam as seen in Table 12.8 excludes the princely states of Manipur and Tripura in 1951.

The population of the region grew from 5,641,878 in 1901 to 9,043,707 in 1951 excluding the population of Manipur, a growth of 54.8 % in a span of five decades, an average growth of 11 % in a decade or a 1.01 % annual growth. This growth has not been uniform in all decades, and in the last decade, i.e. 1941–1951,

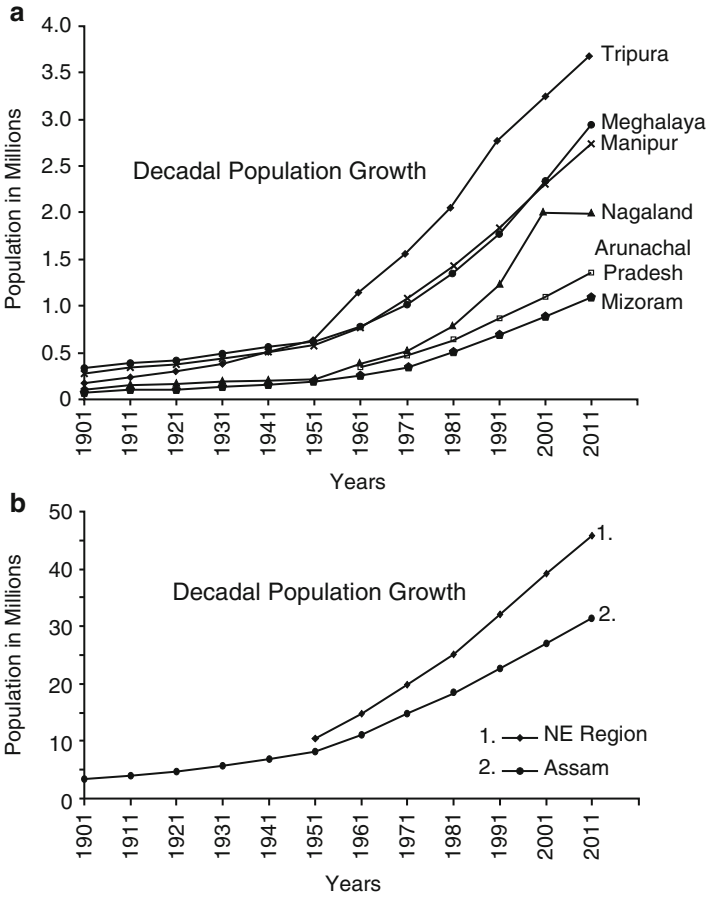

Fig. 12.3 (**a**) Growth of population of the six states of North-East India (Arunachal Pradesh, Nagaland, Manipur, Meghalaya, Mizoram and Tripura) between 1901 and 2011. (**b**) Growth of population of Assam between 1901 and 2011, and for the entire North-East India between 1951 and 2011

there was even a decline of over 10 %. But calculated after keeping the area of the state constant over five decades (1901–1951), there is an increase of over 137 %, from over 3.8 million in 1901 to over 9 million in 1951, a decadal average increase of about 15 % in the first and 19 % in the second quarter of the last century. There was a sudden spurt in population increase in the second half of the last century, as would be seen later.

The period with the maximum population growth coincided with 1931–1941 decade when there was no territorial change or dispute, no war or pestilence, nor even a major catastrophe. Added to these factors of stability was the impact of

Table 12.8 Population of Assam during the first half of the twentieth century (1901–1951)

Assam	1901	1911	1921	1931	1941	1951
Area in km^2	137,158	137,158	137,304	142,480	142,317	220,173
Population (only British territory)	5,841,878	6,082,256	7,606,230	8,622,251	10,204,733	9,043,707
Decennial growth	–	15.23	13.17	15.73	18.19	−17.26
Population density persons/km^2	42.00	44.34	50.18	53.03	62.65	41.00

Sources:
1. Census of India (1901, vol. IV, Assam, pt. II, table 1, p. 1)
2. Census of India (1911, vol. III, Assam, pt. I, Report, p. 4)
3. Census of India (1921, vol. III, Assam, pt. II, table 1, p. 1)
4. Census of India (1931, vol. III, Assam, pt. II, table 1, p. 1)
5. Census of India (1941, vol. IX, Assam, table 1, p. 2)
6. Census of India (1951, vol. XII, Assam, Manipur & Tripura, pt. II-A tables, table A-13)

immigration. A vast territory under the same power from central India to the eastern border of Assam made interregional migration easy, and based on population density gradient, migration took place from parts of adjacent Bengal, suffused with high population density, to Assam, an area relatively devoid of adequate manpower to develop its own land resources.

The decline of population of the state during the decade 1941–1951, in the aftermath of the Second World War, the end of the British colonial rule and finally the division of the country following its independence was caused by the transfer of some thickly populated areas of Assam to East Pakistan, now Bangladesh. The Sylhet district, with a population well over three million that accounted for nearly 30 % of the total population of the state, was transferred to Pakistan following the partition of India in 1947, because of its religious composition. Addition of frontier territories of Sadiya and Balipara and the eastern part of Naga Hills or the extension of Lakhimpur district did not cause much of an increase in the state's population as these were sparsely peopled land.

There is yet another way of looking at the demographic changes in Assam during the first 50 years of the twentieth century. The Census of India has adopted a different approach. While evaluating the decennial variation in population, they keep the present area of the state or district in view and adjust the population of the previous years conforming to the present areal coverage of the state or the districts as they obtain in the contemporary situation. Thus, while calculating the variations in population of Assam over the previous 50 years, the area of the state has been kept constant (Table 12.9).

This, no doubt, brings about a measure of comparability to see the growth in specific areas; it presents an unreal picture of the state for earlier decades. And, though the overall population of Assam declined in 1951 as a result of the transfer of some territory to Pakistan, regionally and district-wise, there was an increase, comparable to the previous decades, as can be seen from Table 12.10:

Table 12.9 Variation in population in Assam during 1901 and 1951

	According to 1941 census[a]		According to 1951 census[b]	
Years	Population	Decennial variation	Population	Decennial variation
1891	5,478,343	–	–	–
1901	6,127,411	+649,068	3,814,188	–
1911	7,061,034	+933,623	4,482,864	+668,676
1921	7,990,775	+929,741	5,316,590	+833,726
1931	9,218,397	+1,257,622	6,344,456	+1,027,866
1941	10,930,388	+1,681,991	7,593,037	+1,248,581
1951			9,043,707	+1,450,670

[a]As given in the Census of India (1941, vol. IX, Assam, General Tables, Area, Houses and Population, table II, p. 8)
[b]As given in Census of India (1951, vol. XII, Assam, Manipur, Tripura, pt. I-A, table II, p. 6). In this case the population of Assam for earlier decades is adjusted to the area of the state as it existed in 1951

Table 12.10 Decadal population growth 1941–1951 (area adjusted)

Region/districts	Population in 1941	Population in 1951	Percent growth 1941–1951
Brahmaputra plains division 1	5,695,659	6,689,693	+17.45
Cachar	641,181	1,115,865	+74.03
Goalpara	1,014,285	1,108,124	+9.25
Kamrup	1,264,200	1,490,392	+17.89
Nowgong	710,800	886,955	+24.02
Darrang	736,791	913,841	+24.78
Sibsagar	1,074,741	1,212,224	+12.79
Lakhimpur	894,842	1,078,157	+20.48
Naga Hills	189,641	205,950	+8.50
Lushai Hills	152,786	196,202	+28.40
Manipur state	512,069	577,635	+12.80

1. For Brahmaputra plain, the six districts have been considered for population growth
2. Figures for column 2 and 3 are taken from Census of India, Assam 1941 and 1951, respectively

The population growth between 1941 and 1951 was not uniform and varied not only because of unequal resource endowment or economic development, but also with the extent to which the district experienced the impact of partition of the country in 1947 and the migration of the people. Some districts were the receivers of population, while others lost some of their population. The two-way migration based on religious persuasion of individuals, out of a perceived security risk or better prospects, propelled people in one direction or the other.

The areas with low population growth, almost half the average growth of the Brahmaputra plain, include the districts of Goalpara; the westernmost district of Brahmaputra plain in 1951, bordering East Pakistan; and the Naga Hills district. Even Manipur does not show any increase in average growth rate.

Almost half of its population of Goalpara district (46.3 %) followed Islam, and a large number of them migrated to East Pakistan, now Bangladesh. This explains a growth of less than 10 % over the 1941–1951 decade. This was the scene in the early 1950s immediately following the partition, but the picture is completely reversed as a trail of migration of both Muslims and Hindus started from East Pakistan to Assam, in the late 1950s and continues even today. The result was that the East Bengal Muslim immigrants and their Assam born generation constituted about 15 % of the state's population in 1971, and their percentage distribution at the district level was 34, 25, 37.5, 11.5 and 1.5 in Goalpara, Kamrup, Nowgong, Darrang and Lakhimpur, respectively (Dass 1980). Das's statement that these were the East Bengal Muslim descendants has to be taken with a bit of caution, since even in 1941, the Muslims constituted 46, 29, 35, 16.4 and 4.8 % of the population of these districts, respectively (Census of India 1941, Assam, vol. IX, p. 25). The areas like Naga Hills and Manipur were in the throes of the Second World War, particularly during the closing years. The disturbed conditions in Nagaland between 1944 and 1946 – preceding, during and after the Dimapur–Kohima battle that led to the defeat and retreat of the Japanese forces – were responsible for a negligible population growth in Naga Hills district. The Nagas not only participated in the war but also provided invaluable logistic support to the Allied forces like loyal British subjects. Manipur was also affected during the Second World War but not to the same extent as Naga Hills district.

In contrast to the decline in population of certain districts, there were others whose population swelled following the arrival of Hindu refugees from Eastern Pakistan. These were the districts of Cachar, Darrang, Lakhimpur and Nowgong, which received the largest number of Hindu immigrants from East Pakistan as seen in the high growth of their population ranging between 20 and 25 %, which is much above the average for the Brahmaputra valley.

12.3.2 Population Growth of the North-East Region (1951–2011)

The North-East region of India comprising eight states – Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura – has an area of 263,179 km^2 and a population of 45,588,381 persons. This constitutes 8 % of the area and 3.8 % of the population of India.

The population of this region before the partition of India in 1947 coincided with the population of Assam and the two princely states of Manipur and Tripura, now full-fledged states in their own right. Several states of the North-East, like Mizoram, Nagaland and Meghalaya, were carved out of the old Assam province, and some like Manipur and Tripura were made into states after 1947, by stages. The North-East frontier areas were grouped under a separate state of Arunachal Pradesh, and Sikkim, a former princely state, joined India as one of its states at a later stage. Thus, it is clear that only the last three censuses, viz. those of 1991,

2001 and 2011, were conducted for all the eight states. The population figures quoted for earlier decades for some of these states represent a readjusted figure of areas and population based on the census records of earlier decades. Equally important, a fact to be noted, is that there was no census conducted for Assam in 1981, and the population figure of Assam and its districts was interpolated with the help of 1971 and 1991 census figures. The census for Arunachal was conducted for the first time in 1961.

12.3.2.1 Growth Trend in the First Half of Twentieth Century

There is disproportionate contrast in the population growth trend of North-East region between the first half and the latter half of the twentieth century. In the first half the present North-East region was roughly equivalent to Assam which comprised many of the present-day states, notably Nagaland, Mizoram and Meghalaya together with Sylhet, now part of Bangladesh, besides the two princely states of Manipur and Tripura. Today, all the former constituent units of Assam, as well as the princely states, are full-fledged states. In addition, Arunachal and Sikkim are now included in the North-East region.

The population of Assam rose only by 55 % over a period of half a century (1901–1951) at an average annual rate of just over one percent because of the loss of Sylhet to Pakistan, the most densely populated part of the province with one-third of the total population of the province. For comparison, it is prudent to take the first 40 years when there was not much territorial change. Seen this way, the population of Assam grew by 75 % in four decades, an annual growth of around 1.85 %. This was a modest growth rate in the first half of last century. The picture changed completely in 1951, when there was a decline in total population of the state, attributed not only to the loss following the partition of the country as mentioned above, but also because of addition of areas that had a very low density of population. More importantly, there was a decline even in population density by over 30 % from over 62/km^2 in 1941 to 41 in 1951. Thus, though there was a visible increase in the territory of Assam following a reorganisation of states, and the addition of Mishmi Hills, Abor Hills, Tirap and Balipara frontier and Naga Tribal area, there was a decline in population.[1]

It may be noted that about 90 % of the area of Sylhet district, 12,351 km^2, was transferred to East Pakistan in August 1947, following the partition of the country, leaving only 1,836 km^2 comprising the thanas of Badarpur (121.73 km^2), Ratbari (621.6 km^2), Patharkandi (717.4 km^2) and a portion of Karimganj thana with Assam and which were merged with Cachar in the form of a separate sub-division of Karimganj. This loss of area was more than compensated by the addition of old Khasi states (9,811 km^2) in the United Khasi and Jaintia Hills district. Besides, for census purposes, the district of Mishmi Hills (24,320 km^2), Abor Hills (22,128 km^2), Tirap Frontier Tract (7,449 km^2), Balipara Frontier Tract (31,348 km^2) and

[1] See Census of India (1951, vol. XII, pt. II, A7, pp. 2 & 3).

Naga Tribal Area (5,322 km^2), the un-administered area of Nagaland, was also added to Assam, swelling the area of the latter to 220,173 km^2, almost three times the size of the present-day Assam. In subsequent years, many parts of this large Assam became full-fledged states, leaving Assam with an area of only 78,438 km^2. But despite this increase in area, the population of Assam declined to 9,043,707 in 1951 compared to 10,930,388 in 1941, when it was a part of undivided India.

Taking area per area, the decadal growth of Assam during the first half of the last century was 15–19 %, which accelerated in the second half. This can be demonstrated by comparing the population variation as given in 1941 and 1951, the pre- and post-independent census years.

As can be seen there is a wide discrepancy between the population figures given in Tables 11.9 and 11.10. This discrepancy persists if we compare 1941 Census figures with the earlier decades. As a matter of practice to adjudge variation and to introduce comparability, the Census adjusts the previous Census figures to compare area per area, to understand the growth behaviour of the population.

12.3.3 Territorial Changes of States in the Second Half of the Twentieth Century

Between 1951 and 1985, there have been many changes in the territorial organisation of different states. New states like Nagaland, Mizoram and Meghalaya have been carved out of the old Assam state that extended from Sankosh river on the west to Myanmar border in the east. The princely states of Manipur and Tripura have become full-fledged states. Since these changes were effected at different dates, states with their area and population in different censuses kept changing. For the sake of comparability, what has been done by the Census of India is to adjust the area and the population of the previous censuses to make them comparable to the latest census figures.

As seen from Table 12.11, the population of the North-Eastern region comprising the eight states has grown 3.75 times over a period of six decades (1951–2011). The constituent states show a variable growth rare. The increase over this period is the lowest in Assam (288 %), i.e. the population of Assam has grown 3.8 times and a quarter times. Arunachal shows a similar increase in five decades. At the other end of the scale is Nagaland, its population growing over nine times in 2011 to what it was in 1951. Assam, occupying a median location forming the core of the North-Eastern region with a long demographic history, shows a more representative growth rate, though slightly higher than the gross average growth rate for the country as a whole. Assam does not suffer from frequent droughts, stony terrain or snowy inaccessible heights, as some other parts of India that affect population density and growth. A large part of Assam's population growth, however, is not natural and is ascribed to incessant flow of immigrants from neighbouring Bangladesh and other parts of Nepal and India, causing disproportionate increase in the population of the state.

Table 12.11 Population of the states of North-East region of India with decadal variation (population, actual figure; variation, in percent)

States	1951	1961	1971	1981	1991	2001	2011	Increase in 60 (50) years in percent
Arunachal Pradesh	–	366,558	467,511 + 27.53	631,839 + 35.15	864,558 + 36.83	1,097,968 + 26.99	1,382,611 + 20.59	277 (197)
Assam	8,028,856 + 19.93	10,837,329 + 34.99	14,625,152 + 34.95	18,041,248 + 23.35	22,414,322 + 24.23	26,655,528 + 18.92	31,169,611 + 16.93	288 (232)
Manipur	577,635	780,037 + 35.03	1,072,753 + 37.52	1,420,953 + 32.45	1,837,149 + 29.28	2,294,000 + 24.86	2,721,756 + 18.65	371 (297)
Meghalaya	605,674	769,380 + 27.02	1,011,699 + 31.49	1,335,819 + 32.67	1,774,778 + 32.86	2,318,822 + 30.65	2,964,067 + 28.72	389 (283)
Mizoram	196,202 + 28.40	266,063 + 35.60	332,390 + 24.92	493,757 + 48.54	689,756 + 39.69	888,575 + 28.82	1,091,014 + 22.78	456 (353)
Nagaland	212,975	369,200 + 73.35	516,449 + 39.88	774,930 + 50.04	1,209,546 + 56.08	1,990,036 + 64.52	1,980,602 − 0.47	830 (834)
Sikkim	137,725 + 13.34	162,189 + 17.76	209,843 + 29.38	316,385 + 50.77	406,157 + 28.37	540,851 + 33.16	607,688 + 12.36	341 (293)
Tripura	634,029 + 24.56	1,142,005 + 78.70	1,556,342 + 36.28	2,053,058 + 31.90	2,757,205 + 34.29	3,199,206 + 16.03	3,671,032 + 14.75	479 (401)
North-East region	10,398,096	14,662,761 + 37.98	19,792,139 + 34.98	25,067,989 + 26.65	31,953,771 + 27.46	38,857,771 + 21.60	45,588,381 + 17.32	338 (274)
India	361,088,000 + 13.31	439,235,000 + 21.64	548,160,000 + 24.80	683,324,000 + 24.60	846,303,000 + 23.85	1,028,737,000 + 21.60	1,210,193,422 + 17.64	235 (185)

1. Census of India, India, General Population Tables, India, States and Union Territories, tables A1 to A3
2. The figures for Assam for 1981 are interpolated, as there was no Census in Assam in 1981
3. The decennial growth for Arunachal, Meghalaya and Nagaland 1941–1951 is not given, because there was no Census in 1941 in Arunachal or there was a substantial change of territory as in the case of Meghalaya
4. Population figures for 2011 are taken from Census of India 2011, Provisional Population Totals

Table 12.12 Changes in the religious composition of Goalpara district between 1941 and 1951

Year	Population of Goalpara district	Hindu population	Percentage of Hindu population	Muslim population	Percentage of Muslim population
1941	1,014,285	306,223	30.19	468,924	46.23
1951	1,108,121	570,080	51.53	475,825	42.90
Growth between 1941 and 1951 in %	+9.25	+86.49	21.34	+1.47	−4.14

Sources:
1. Marar (1941)
2. Census of India (1951:106–107)

The growth in the peripheral hilly areas of the region is phenomenally high, some of which could be attributed to over-enumeration as in the case of Nagaland. Besides Assam, Tripura is another state that has been the recipient of immigrants, both during the wake of partition and subsequently whenever there is unrest in adjacent Bangladesh. The story of Chakma refugees is more recent when about 100,000 Chakmas, Buddhist in faith and victims of religious persecution, left Chittagong territory of Bangladesh and took refuge in Tripura, following the Indo-Pakistan war of 1971. Thus, while Assam and Tripura have experienced growth because of immigration, the peripheral states of Nagaland and Mizoram show a growth rate, possibly because of improved economic conditions.

12.3.4 Demographic Scene in the Aftermath of Partition of India in 1947

12.3.4.1 Population in 1951 and the Two-Way Migration of People

The negative increase in population of between 1941 and 1951 is attributed not only to the loss of some territory to East Pakistan (now Bangladesh), unstable conditions during the Second World, but also above all to the emigration of some Muslim population from Assam to East Pakistan. The most illustrative case of this type is Goalpara district, the westernmost district of Assam, now divided into five districts of Dhubri, Kokrajhar, Bongaigaon, Barpeta and Goalpara (Table 12.12).

As can be seen, there is an unprecedented increase of 86 % in the population of Hindus, in a span of 10 years, an impossible proposition, if only natural increase is considered, as the area of the district remained more or less the same. A natural increase of about 15 % should have at the most led to a population of 360,000, but an increase of over 86 % suggests an unambiguous case of immigration of Hindu population from East Pakistan. In contrast, there is a decline in Muslim population by

1.5 % and a fall over 4 % in the share of Muslim population in the total population of the district. This nominal increase in Muslim population, much below the natural increase of around 15 %, can be explained only by emigration. An estimated 70,000 Muslims should have migrated to East Pakistan, immediately following the partition. A steep decline of 42.6 % in the population of Muslims in Assam during the decade 1941–1951 is generally attributed to the transfer of Sylhet district to East Pakistan.

Thus, the border district of Goalpara was marked by a two-way movement of population. The immigration of Hindu population from East Pakistan was much larger and could be an estimated 200,000 people.

The immigration of Hindu refugees in Assam, immediately after 1947, forced either by persecution or prompted by the fear of persecution in East Pakistan, not only inflated the Hindu component of population in Goalpara but also in the neighbouring district of Kamrup, where the strength of Hindus jumped from 55 % in 1941 to 70 % in 1951. Similarly, an increase of about 25 % in the population of Nowgong (now Nagaon) despite transfer of a part of its territory to form the new district of united Mikir and Cachar Hills suggests a huge infusion of population. Transfer of territory largely inhabited by tribes to Mikir Hills did not materially affect the population of Hindus and Muslims, and both the communities, Hindus and Muslims, found it a convenient area to migrate, the former to seek shelter as refugees and the latter in search of better land resources from Cachar district where the Muslims though not a majority had a slightly higher concentration (36.2 %) against the Hindu population of 35.2 %. Partition changed the entire picture, as that part of Sylhet that had more the 50 % of Hindu population was added to Cachar, and its religious composition changed. This may have forced the Cachar Muslims to migrate to Nowgong.

Till 1951, where there was a refugee immigration of Hindus, this was partly compensated by the emigration of Muslims from border areas like Goalpara. But, there was also internal movement of population of Muslims for reasons of security and better livelihood. In Assam, Cachar, Nowgong and Darrang districts showed an above-average growth rate.

After 1951, the situation changed and almost all the states of the North-East showed a remarkable increase in their population for two decades ending 1961 and 1971, registering an increase of over 35 % in each decade. It was not the case of only sparsely peopled states like Nagaland and Tripura, but the most densely peopled areas of Brahmaputra and Barak valleys also showed a remarkable increase. These were the decades when the rate of India's population growth was also on the rise. India's population growth rose from 13.31 % during the decade 1941–1951 to 22 % during 1951–1961 and 25 % during 1961–1971 decades. During these decades the population of all the states in the North-East rose sharply to show a gradual decline in the late 1970s and the 1980s.

As 1950s were the watershed that saw steep rise in the growth rate, 1980s were another landmark that set the peak from where the population curve started moving downward. While the rise in the 1960s and 1970s is attributed to immigration and

better health care, the 1980s saw the result of Family Planning Programme and reflected national concern for excessive growth in India's population. The state most influenced by Family Planning Programmes in the North-East was Assam; the smaller states like Nagaland, Mizoram, Tripura and Arunachal Pradesh continued growing at a rapid rate. In the population growth of the North-Eastern states, besides the natural growth that was influenced by Family Planning Programme launched all over the country, other factors like migration, both interstate and international, always remained a potent factor.

A second spurt in immigration from Bangladesh, following the 1971 Indo-Pakistan war and the liberation of Bangladesh, influenced in no small measure the rise in Assam's population in the 1970s of the last century. Though all the states bore the brunt of the migration from Bangladesh, Assam and Tripura were the worst affected. Immediately after the liberation of Bangladesh and its independence that saw improved relations between India and Bangladesh, there followed a migration wave, initially of political refugees forced out by the Pakistan army that turned later into a massive influx of illegal immigrants.

The continued higher growth of Tripura in successive decades is clearly the result of immigration of Bengali-speaking people, essentially Hindus, initially from Bangladesh, but subsequently even from Assam. The agitation of the 1980s in Assam contributed in no small measure to the migration of a large number of families from Assam to Tripura. The sudden increase in the Hindu population of Tripura from 76 % in 1961 to 89.5 % in 1971 and a corresponding decline in Muslim population for over 20 % in 1961 to 6.6 % in 1971 clearly reflects the two- way migration, the Hindus arriving from Bangladesh and the Muslims leaving for Bangladesh.

The population growth rate has taken a downturn in Assam, Sikkim and Manipur since 1981, despite continued immigration in Assam. In Sikkim and Manipur, it is the result of the population composition where non-tribal population is in majority. The case of Tripura stands at a different footing because of continued immigration of not only from Bangladesh refugees like the Chakmas, the followers of Buddhism, whose number swelled to 128,260 in 1991, but also even from other districts of Assam. It is a safe haven for Bengali-speaking Hindus and even other non-Muslims.

The peripheral hilly areas of the North-East, forming a girdle in the north and east, are very sparsely peopled because of poor resource endowment, isolation from the plains and their ethnic composition. But, despite the paucity of resources, the population of these hilly states has grown unexpectedly during the last few decades. In case of Nagaland, the state showed a population growth of over 50 % during the decade of 1971–1981 and 56 and 64 % during the successive decades 1981–1991 and 1991–2001. Meghalaya continues to record a higher growth of over 30 % ever since the beginning of the 1970s of the last century but shows signs of gradual decline in its growth rate. The last decade witnessed a growth rate of 27.8 %, though lower than the previous decade it is much higher than the national regional average.

Table 12.13 Decadal growth rate of North-Eastern states and India in percentage

Territorial unit	1911	1921	1931	1941	1951	1961	1971	1981	1991	2001	2011
India	5.74	–0.3	10.60	14.20	13.30	21.64	24.80	24.60	23.80	21.50	17.64
NE. Region	–	–	–	–	–	37.61	34.98	26.65	27.46	21.60	17.32
Arunachal	–	–	–	–	–	–	38.90	35.15	36.80	27.00	25.92
Assam	16.99	20.48	19.90	20.40	19.93	34.98	34.95	23.35	24.23	18.92	16.93
Manipur	21.80	10.90	6.14	14.80	12.80	35.04	37.50	32.46	29.29	24.86	18.65
Meghalaya	15.54	7.10	13.98	15.60	8.92	27.03	31.50	32.04	32.86	30.65	27.82
Mizoram	10.97	7.69	26.50	23.38	28.42	35.60	24.93	48.55	39.70	28.82	22.78
Nagaland	46.0	6.71	12.57	6.14	12.30	73.35	39.88	50.05	56.08	64.53	–0.47
Sikkim	49.15	–7.30	34.14	10.90	13.10	17.76	29.36	50.77	28.47	33.06	12.36
Tripura	32.94	32.17	25.65	34.30	24.56	78.71	36.28	31.92	34.90	16.03	14.75

Source: Census of India for the relevant years. The apparent decline in the population of Nagaland in 2011 is generally attributed to the inflated population in 2001.

Table 12.13 summarises the growth rate of different states of the North-East region of India vis-à-vis the entire country:

One may summarise the population growth trend of the North-East as follows:

The population growth of the North-East region follows the national trend, though at a slightly higher level.

All the states in the North-East show a higher growth in the two decades ending 1961 and 1971.

Assam and Tripura, both show the highest growth in the decade ending 1961, as a result of huge migration of population from Bangladesh.

Most of the states show a declining growth trend after 1981, following Family Planning Programme.

The state of Nagaland is an exception, which has shown an inexplicable growth of 64 % during the 1991–2001 period, usually ascribed to over-enumeration.

In the last decade (2001–2011), all states of the North-East with the exception of Arunachal Pradesh, Meghalaya and Mizoram have shown a decadal growth of less than 20 %.

12.4 Composition of Population

Composition of population in the North-East region of India could be based on ethnicity, language, religion, educational achievement or literacy, besides age and sex ratio of the population. It is not the intention of this chapter to discuss the different tribal groups of the North-East. It would be interesting to know the contrast between different states in their composition in general, Scheduled Caste and Scheduled Tribe population. It is important, as half the states of the North-East have a dominance of tribal population, population scheduled in Indian Constitution.

Table 12.14 Population of S.T. and S.C. and their percentage share in the total population of the N.E. region

States	Population S. T.	Population S.C.	Percentage S. T. population to total population of the state	Percentage S. C. population to total population of the state	% of S. T. population of S.T.in the state to the total S. T. population of N. E. region	% of S. C. population of S.C. in the state to the total S.C. population of N. E. region
Arunachal P.	705,158	6,188	64.22	0.56	6.73	0.23
Assam	3,308,570	1,825,949	12.40	5.82	30.59	70.16
Manipur	741,141	60,037	34.20	2.77	7.08	2.71
Meghalaya	1,992,862	11,139	85.94	0.48	19.04	0.50
Mizoram	839,310	272	94.45	0.03	8.00	0.012
Nagaland	1,774,026	–	89.14	–	16.95	–
Sikkim	111,405	27,165	20.29	5.02	1.06	1.22
Tripura	993,426	555,724	31.05	17.37	9.49	25.09
N. E. region	**10,465,898**	**2,486,479**	**26.53**	**5.70**	**98.94**	**99.97**
India	84,325,240	166,635,700				
% North-East S.T. and S.C. population of the total for India	12.40	1.49				

Source: Census of India (2001) Series 1, Final population Totals, pp. 1–167

It is generally perceived that the states of North-East India have a majority of tribal population, a position only partially correct. Out of the eight states, the three states of the north-eastern and eastern periphery, viz. Arunachal Pradesh, Nagaland and Mizoram, and Meghalaya, the last a plateau sandwiched between Assam plain and Bangladesh, have a majority of their population constituted of Scheduled Tribes, and the remaining four states, viz. Assam, Tripura, Manipur and Sikkim, have a much lower level of Scheduled Tribe population (Table 12.4).

The entire North-East, considered together, has over a quarter of its population in the category of Scheduled Tribe (Table 12.14).

The entire North-East region with eight states has only 12.5 % of the total population of Scheduled Tribes and 1.46 % of the total population of Scheduled Castes in the country. In terms of absolute number, the highest number about 31 % of the S. T. population of the North-East region comes from Assam, around 19 % from Meghalaya, 16 % from Nagaland, 9.5 % from Tripura, 8 % from Mizoram and over 6 % from Arunachal Pradesh. Yet, if one talks of concentration of Scheduled Tribes in the population of each state, Mizoram, Nagaland, Meghalaya and Arunachal have 94, 89, 86 and 64 %, respectively, of their population constituted of tribal communities, though their number may be small. In these states, one hardly finds any trace of

permanently settled non-tribal population. The non-tribal population in these states consists of people who are in the administration either in central or state services or professionals working on projects or businessmen running diversified trades without any prospect of their being domiciled or owning property.

These states are the exclusive domain of tribal population, protected by an archaic Act of 1873, passed by British Parliament and continued and adopted by the Government of India giving these states the status of excluded or partially excluded areas and subject to Inner Line Regulation. The three states of Nagaland, Arunachal Pradesh and Mizoram don't even allow non-tribal people to enter their state without any entry permit, let alone owning property, which in any case is barred by the Tribal Land Alienation Act. Even children born to non-tribals, nurtured and educated in these states during the tenure of their parents, don't receive the domiciled status and have no title either to own property or seek employment except under contractual terms of state government. This has not permitted any increase in non-tribal population in these states.

Some of these states are home to specific tribal communities, like Nagaland dominated by Nagas of different clans, Mizoram by the Mizos and Lakhers, Meghalaya by Khasis and Garos and Arunachal by a large number of tribal communities.

In Tripura, where the Scheduled Tribes form only one-third of the population, they are largely concentrated in the hilly and forested area of Dhalai district. Similarly, much of the tribal population of Assam is concentrated in the hilly Karbi-Anglong district, followed by Dhemaji and Lakhimpur district as well as the districts of western Assam, notably Kokrajhar with one-third of its population being tribal. Other districts of western Assam have substantial population of Scheduled Tribe people, but their relative strength is often below 20 %. If the absolute number of Scheduled Tribe population is taken as criterion, Karbi-Anglong, Kokrajhar, Dhemaji, Kamrup and Darrang are the five districts in descending order. But if concentration of Scheduled Tribes is considered, North Cachar Hills (68.3 %), Karbi-Anglong (55.2 %), Dhemaji (47.3 %), Kokrajhar (33.7 %) and Lakhimpur (23.5 %) are the districts which stand in descending order of concentration of Scheduled Tribe population in the districts.

Contrasting with the generalised picture of strength of around 12 % of Scheduled Tribe population, the latter constitute 56 % of the population in Karbi-Anglong and 68 % of the North Cachar Hills (Dima Hasao). These are hilly forest covered areas, with irregular dissected terrain devoid of any plain and hardly any permanent cultivation, and the Karbis, Dimasas, Kacharis and even Hmars have made this region their homeland. Another area of Scheduled Tribe concentration is the north-eastern part of Brahmaputra plain, north of the river coinciding with Dhemaji and Lakhimpur districts, showing a Scheduled Tribe concentration of over 47 % in Dhemaji and 24 % in Lakhimpur. These are plain Miris many of whom have adopted Hinduism. The Kokrajhar district in the western extremity of Brahmaputra plain has a high concentration of Scheduled Tribes, particularly the Bodo tribes, accounting for over one-third of the total population.

Assam has a cultural history which has witnessed the arrival and spread of different faiths in the Brahmaputra valley. These faiths could not penetrate the forest clad hilly terrain of the borderlands, from Arunachal Pradesh and Nagaland to Mizoram,

Table 12.15 Sex ratio of North-Eastern states from 1991 to 2011

	Sex ratio									
	Total population			Rural population		Urban population		Scheduled Tribes only	0–6 years	
States	1991	2001	2011	2001	2011	2001	2011	2001	2001	2011
Arunachal	859	893	920	916	929	819	889	1,003	964	960
Assam	923	935	954	945	956	872	937	965	965	957
Manipur	958	978	987	978	966	1,009	1,038	965	957	934
Meghalaya	955	972	986	969	983	982	997	980	973	970
Mizoram	921	935	975	923	950	848	1,000	1,000	964	971
Nagaland	886	900	931	883	942	915	915	984	964	944
Sikkim	878	875	889	880	883	830	908	943	963	944
Tripura	945	948	961	946	956	859	976	957	966	953
N. E. region	927	937	954		955		953			956
India	927	933	940		947		926		927	914

Sources:
Census of India 2001, A series, General Population Tables table A-1 to A-3, pp. 133–137
Census of India 2011, Provisional Population Totals, Vol. 2, 1 for different states

and even the high altitude plateau of Meghalaya inhabited by the Khasis and the Garos. These areas, which have a predominance of tribal population, were penetrated by Christian missionaries in the nineteenth and twentieth century, and large mass of tribal population was proselytised to Christian faith. In fact, the majority of the population of Nagaland, Mizoram and Meghalaya has adopted Christianity; yet they are considered among the tribes for reasons of their ethnicity.

A fuller account of different tribal communities and the societies in the North-East is given in the Chap. 11.

12.4.1 Sex and Age Composition

Sex composition in a society is expressed by what is commonly known as sex ratio. It is important in that it affects the fertility, natural growth and the character of the work force, but more importantly, but a balanced sex ratio imparts stability to the society. An adverse sex ratio, either way, gives rise to social tension producing deviant behaviour and causing instability in the society.

Usually sex ratio is expressed by the number of females per 1,000 males in a given population. One may look at the sex ratio of different states in the North-East against the backdrop of the sex ratio of the country as a whole (Table 12.15).

With the exception of Nagaland, Arunachal Pradesh and Sikkim, most other states of the North-East have a sex ratio close or above the national average of 940 in 2011. The North-East, on the whole, shows a slightly higher sex ratio. Manipur and Meghalaya have the highest sex ratio, the former because of the traditional importance of women in business and trade and the latter because of their being a

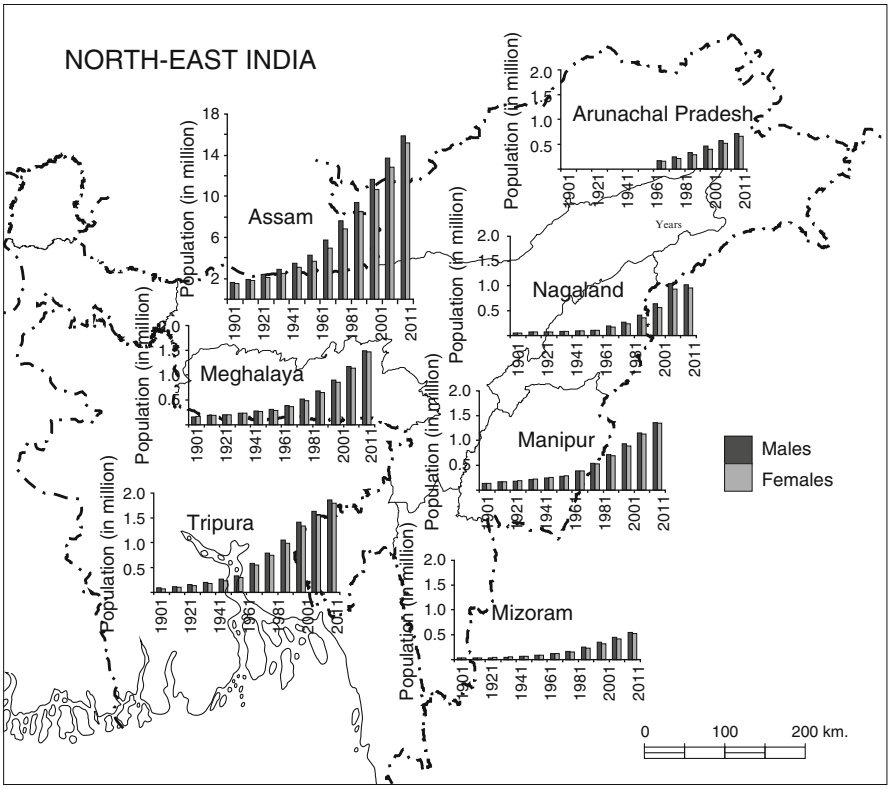

Fig. 12.4 Growth of male and female population in the states of North-East India from 1901 to 2011

matrilineal society, where the women inherit the family property and are socially as important as their men folks (Fig. 12.4).

The case of the sex ratio in Arunachal Pradesh is very different. If one takes only the Scheduled Tribes, the state has a sex ratio of over 1,003, with several districts like Tawang, East Kameng, Lower Subansiri, Upper Subansiri and East Siang all showing a sex ratio of over 1,000. Arunachal has only 64.22 % of its population enumerated as Scheduled Tribes; the remaining population has resulted from the huge infusion of workers and professionals in all segments of administration in the state. A large number of them arrive without their families, as these immigrants don't have and cannot attain a domiciled status even after prolonged stay. This applies as much to the children born to un-domiciled professionals as to them, leaving them no option to leave part of their families behind, particularly the ladies in the security of their extended families.

Also, many professionals, like engineers, doctors, teachers and administrators, are on short-term deputation and stay alone, to return to their original postings after their term expires. The non-tribal people in the state have a very adverse sex ratio, bringing the total sex ratio down.

The infant sex ratio of the children, below the age of 6 years, is surprisingly similar in most states varying between 934 the lowest for Manipur to 970 for Meghalaya and 971 for Mizoram the highest in the region. It is generally believed that the discrimination that follows in bringing up the children rearing male and female child that tilts the ratio is in favour of one or the other sex. In most cases, the sex ratio of the entire population is lower than what it obtains among the infants, except Meghalaya where children of both sexes receive unbiased attention, and in Manipur where the sex ratio improves with advancing age, perhaps an appreciation of the asset value of the growing female child. An extremely low sex ratio in Sikkim could be explained by the religious composition of the population. A large component of Sikkim's population has adopted Buddhism, the religion in which the life of monks, who are celibates, is respected.

The rural sex ratio is usually higher than the urban sex ratio in most India, yet it is not so in the North-East. For different states, the sex ratios of rural and urban population reflect the respect and the importance the women command in different societies and the level of urbanisation. In Manipur, Meghalaya and Mizoram, there is not only a better balanced sex ratio, but even the rural urban differential comes down considerably. In the above states, the sex ratio is higher in urban areas than in the rural societies. This could be explained, besides the women's right, by their role and participation in urban functions. Not a small number of enterprises are run by women in Manipur and Mizoram. In contrast, the concentration of non-tribals living without families in the urban areas has led to a very low sex ratio in the urban centres of Arunachal Pradesh. Assam, like any other state of India, with large urban centres has a low sex ratio because of migrant labour working in the towns. The sex ratio in the Brahmaputra plain is related to the level of urbanisation in each district.

12.4.2 Literacy in the North-East Region

Literacy is an important attribute of any population. Some believe that 'with increase in overall literacy rate, segmental disparities do tend to decline' (Panda and Mohapatra 2003). This may or may not hold true, but a higher level of literacy and educational achievement would certainly improve the economic state of the people through empowerment.

Literacy is one of the attributes of population in which the North-Eastern states either compare favourably with India or exceed the national average. Secondly, there is a growing effort towards education, and the literacy is improving rapidly in these states (Table 12.16). Generally, the people belonging to Scheduled Castes and Scheduled Tribes have a lower percentage of literate people. Equally, there is a disparity between the level of literacy between males and females. 'The prevalence of strong societal prejudice against women's mobility and education has been responsible for the slow progress of literacy in the state' (Kar 2001).

Table 12.16 Literacy rates in North-East India

	Literacy rates per 1,000 persons of the age 7 or above								
	In 1991			In 2001			In 2011		
State	Total	Males	Females	Total	Males	Females	Total	Males	Females
Arunachal	41.5	51.4	29.7	54.3	63.8	43.5	66.95	73.69	59.57
Assam	52.9	61.2	43.0	63.3	71.3	54.6	73.18	78.81	67.27
Manipur	59.9	71.6	47.6	70.5	80.3	60.5	79.85	86.49	73.17
Meghalaya	49.1	53.1	44.9	62.6	65.4	54.6	75.48	77.17	73.78
Mizoram	82.3	85.6	78.6	88.8	90.7	86.7	91.58	93.72	89.40
Nagaland	61.7	67.6	54.7	66.6	71.2	61.5	80.11	83.29	76.69
Sikkim	–	–	–	–	–	–	82.20	87.30	76.43
Tripura	60.4	70.6	49.6	73.2	81.0	64.9	87.75	92.18	83.15
India	52.2	64.1	39.3	64.8	75.3	53.7	74.0	82.1	65.5

Source: Census of India 2011, Provisional Population Totals, Vol. 2, 1 for different states

The literacy rate in the North-East region, though not quite what the region would like to achieve – 100 % literacy – compares favourably with India and is ahead of many less developed states of the country like Bihar or Uttar Pradesh. A lot of schools and colleges have sprung up in the remotest part of the region, during the last two or three decades. The literacy rate in Mizoram is the highest in the country. This is partly ascribed to a religio-cultural resurgence of the state where about 90 % of the people have adopted Christianity. The family thinks of sending every child to school as much as they are encouraged by the church. Even the female literacy in Mizoram is very high (89.4 %). A high rate of literacy is changing the social base of the society. One cannot comment here on the impact of Christianity on the sociocultural attitude and life of people, but what is undoubtedly true is the role of Christian missions in Mizoram and even in Nagaland in generating interest among these groups for education and modern way of life. That this has not happened in Meghalaya is a paradox. For one, the level of proselytisation in Meghalaya is lower than what one finds in Mizoram, though it started much earlier. Only 70.3 % of Meghalaya's population has adopted Christianity, and the tribal population is still widely scattered in the hilly countryside, some of them practising their traditional animistic beliefs.

The state lagging behind in educational achievement and literacy is Arunachal Pradesh that also explains why a large number of professionals are drafted from outside the state to run the subordinate and professional services. Arunachal Pradesh achieved the status of a state only in the 1980s of the last century, and it is quite a difficult task to reach the distant corners of the hilly state that has the largest area (83,743 km^2) in the North-Eastern region. Accessibility is a problem, but Arunachal Pradesh may soon catch up with its neighbours in education.

As a matter of policy, the North-East has the largest number of universities, many of them funded by the Central Government.

Table 12.17 No. of villages and towns and the percentage of population living in villages and towns

State	Years	No. of villages	No. of towns	Percentage of rural population	Percentage of urban population	Average size per village
Arunachal P.	2001	4,065	17	79.40	20.69	214
	2011	5,589	27	77.33	22.67	
Assam	2001	26,312	125	87.10	12.90	882
	2011	26,395	214	83.62	16.38	
Manipur	2001	2,391	33	73.42	26.58	665
	2011	2,588	51	69.79	30.21	
Meghalaya	2001	6,026	16	80.38	19.62	309
	2011	6,839	22	79.92	20.08	
Mizoram	2001	817	22	50.28	49.61	547
	2011	830	23	49.49	51.51	
Nagaland	2001	1,317	9	82.77	17.23	1,250
	2011	1,428	26	71.03	28.97	
Sikkim	2001	452	9	88.91	11.09	1,064
	2011	452	9	75.03	24.97	
Tripura	2001	870	23	82.93	17.07	3,049
	2011	875	42	73.82	26.18	
N. E. region	**2001**	**42,250**	**254**	**82.00**	**18.00**	
	2011	**44,996**	**414**	**79.12**	**20.88**	

Sources:
1. Census of India 2011 Provisional Population Tables Number of Administrative Units, Districts, Villages and Towns 2001 and 2011
2. Census of India 2011 Rural Urban Distribution of Population (provisional)
3. See http//www.census india.gov.in/2011-prov-results/data-files/india/paper-contentsetc.pdf

12.4.3 Habitat of the People

There is a separate chapter on the level of urbanisation and the growing number of towns in the North-East, as well as the character of villages discussed under 'Human Settlements'. Here an outline is given about the proportion of the population living in towns and villages, their number and size (Table 12.17).

The total population of over 45 million (2011) lives in over 44,996 villages and 414 towns (2011). Theoretically, there is a ratio of one town for 110 villages, the towns being much larger, the ratio between their population is that of the average population of a town being equal to the population of 31 villages.

The process and level of urbanisation and the spread of villages and towns in the region are discussed at length in another chapter. Suffice here to say that Assam and Tripura, the two states with the highest population, and an organised cluster of settlements, have 17–26 % of urbanisation, respectively. A high level of urbanisation as seen in Mizoram (51.5 %) and Arunachal Pradesh (22.6 %) is more a reflection of the administrative classification of settlements where standard census definitions have not been followed.

12.4.4 Birth and Death Rate: The Components of Natural Population Growth

The population growth of a region or a community of people is determined by its natural growth and migration. Natural growth could be positive or negative depending on the balance between the birth rate and the death rate. In a normal situation, birth rate is higher than death rate unless there is some sudden and prolonged scourge of epidemics as it happened in history. Natural growth is as such the excess of birth over death over a specific period of time. Migration could be immigration or emigration. The former leads to a decline and the latter to an increase in the population of a region or a community. The natural growth is a perpetual process, whereas migration is episodic and uncertain and occurs following certain events like war, persecution of minorities and a catastrophic situation like drought and can be even caused by poverty. A contrast in living conditions between adjacent countries, or job opportunities or simply wage differentials could also prompt migration where the migrants move as refugees for protection and even as illegal immigrants.

In the case of the North-East region of India, natural growth and migration have operated simultaneously, the latter not insignificantly. The natural growth in the region is clear from Table 12.18 having birth and death rates during different decades:

It is not possible to show the birth and death rates of all these states for earlier decades, as several of these states came into existence successively in different years after 1947, but more specifically at different dates of reorganisation of the territory in the North-East.

As the pattern of natural growth emerges, four main categories can be recognised:

1. The states where the birth and death rate both have greatly changed. This is the case with Tripura, which records the lowest natural growth rate of 10.5‰, and Mizoram (11.3‰) can be included in this category.
2. The second category is of such states as have shown a great decline in birth rate and have constantly maintained a low death rate, as in the case of Manipur where the birth rate declined from 33.3‰ in 1971 to 18.3‰, while the death rate that was already low declined marginally from 6.9 in 1971 to 5.2 in 2001 recording a natural growth of 13.2‰.
3. The third category refers to the states that showed a very moderate decline in birth rate, but a drastic decline in death rate, as in Assam, to record a lower yet an above-average rate of growth. A decline in natural growth rate in this case is more a function of death rate. Assam still shows a high birth rate of 27 per 1,000, higher than the other five states, viz. Arunachal, Manipur, Mizoram, Tripura and Sikkim. The two states that still show a high birth rate are Nagaland (30‰) and Meghalaya (28.2‰).
4. Tripura is the solitary state that has substantially brought down its birth rate (16.1‰) as well as death rate to 5.6‰, thus recording a growth rate of 10.5 % during the decade ending 2001.

Table 12.18 Birth and death rates in North-East India (1971–2001) per thousand of population

States		1971	1981	1991	2001
Arunachal Pradesh	Birth rate	36.8	32.1	30.9	22.2
	Death rate	19.8	12.1	14.5	6.0
	Growth	17.0	21.0	16.4	16.2
Assam	Birth rate	36.4	34.2	30.8	27.0
	Death rate	17.9	12.4	10.4	9.6
	Growth	18.5	21.8	20.4	17.4
Manipur	Birth rate	33.3	26.6	20.1	18.3
	Death rate	6.9	6.6	5.4	5.2
	Growth	26.4	20.0	14.7	13.2
Meghalaya	Birth rate	–	32.6	32.4	28.2
	Death rate	–	8.2	8.8	9.0
	Growth	–	24.4	23.6	19.2
Mizoram	Birth rate	NA	NA	NA	15.7
	Death rate	NA	NA	NA	4.4
	Growth	NA	NA	NA	11.3
Nagaland	Birth rate	24.6 (1974)	24.9 (1979)	18.5	30.2 (1997)
	Death rate	9.3	5.3	3.3	4.8 (1994)
	Growth	15.3	19.6	15.2	25.4
Sikkim	Birth rate	–	31.0	22.5	21.6
	Death rate	–	8.9	7.5	5.1
	Growth	–	22.1	15.0	16.5
Tripura	Birth rate	35.8	26.4	24.4	16.1
	Death rate	15.3	8.0	7.6	5.6
	Growth	20.5	18.4	16.8	10.5

Source: Basic Statistics of NER (2006:166–167)

The highland states like Nagaland, Manipur, Mizoram and Meghalaya had always recorded a relatively lower death rate after 1960 and declined further in the last quarter of the twentieth century, but the decline in birth rate is marginal. Nagaland and Meghalaya still show a high birth rate. For Meghalaya, it was still 28.2 % in 2001. For Nagaland over 30 % birth rate was recorded in 1997.

Traditionally, the plains of Assam, Tripura and Manipur had higher birth rates. In recent decades this has been brought down substantially though Assam still has a birth rate of 27‰.

Most of the states in North-East India compare favourably with the birth rate (25.8‰) and the death rate (8.4‰) for India. The only exception is Nagaland still showing a very high growth rate, resulting from a very high birth rate and a low death rate.

12.4.4.1 Migration

No part of India is as much affected by migration, both international and interstate, as the states of the North-East. The worst affected is Assam, where continued immigration of people originally from East Pakistan, now Bangladesh, and other

states of the country seem to be changing not only the demographic nature of the Assamese society but also poses serious threat to the livelihood of original inhabitants of the state. An elaborate discussion of migration in the region can be found in the sequel (Chap. 13).

References

Allen BC (1902) Census of India 1901, vol IV. Assam Secretariat Printing Press, Shillong
Banthia JK (ed) (2001) Census of India 2001. First report on religion. Government of India
Basic Statistics of NER (2006) North-Eastern Council Secretariat, Shillong
Census of Assam for 1881 (1883) Superintendent of Government Printing Press, Calcutta (The Province of Assam under the Jurisdiction of the Chief Commissioner J C Lyall)
Census of Assam for 1891 (1891) Parts I & II. Superintendent of Government Printing Press, Calcutta
Census of India (1941) Assam including Sadiya and Balipara tracts, Manipur and Khasi States, vol IX
Census of India (1951) Assam, Manipur, Tripura, including Mishmi Hills, Abor Hills, Tirap Frontier and Balipara Frontier, vol XII, pt. II A, General Population Tables
Census of India (1961) General population tables, vol XXIII. Nagaland. pt. II A
Census of India (1971a) General population tables, Series 15, Nagaland. pt. II A
Census of India (1971b) Tripura. Series 20, General tables I-A, report
Census of India (1971c) Series 3, Assam. pt. II C (II), Social and cultural tables and migration tables
Census of India (1971d) Series 3, Assam, pt. II A, General population tables
Census of India (1991a) Languages, language atlas of India. Controller of Publications, New Delhi
Census of India (1991b) Series 1, India, pt. V, D series, Migration tables, vol I, India, States and Union Territories
Census of India (1991c) Series I, India, Paper of 1995 religion
Census of India (2001) General population tables, population of India, states and union territories
Census of India (2011) Provisional population totals paper 1 and 2, for each of the States of the Northeast
Central Statistical Organisation (2006) Selected socio-economic statistics of India. Central Statistical Organisation, New Delhi
Chaudhuri JG (1980) Tripura: the land and its people. Leeladevi Publication, New Delhi
Das HP (1970) Geography of Assam. NBT, New Delhi
Dass SK (1980) Demographic transformation of Assam. Econ Polit Wkly XV(19):850–859
Gait EA (1902) The lower provinces of Bengal and their Feudatories. Census of India 1901, vol VI, pt. I, Report
Hunter WW (1881) Imperial Gazetteer of India, vol IV. Trubner & Co., London
Kar BK (2001) Population (of Assam). In: Bhagabati AK, Bora AK, Kar BK (eds) Geography of Assam. Rajesh Publications, New Delhi, p 144
Khobung L (1955) Trans-border migration and political conflicts: a case study of Chakmas. MA dissertation, Jawaharlal Nehru University
Lloyd GT (1923) Census of India 1921, vol III, Assam, pt. II, tables. Assam Secretariat Press, Shillong
Marar KWP (1941) Census of India 1941, vol IX, Assam, tables, pp 24–25
McSwiney J (1912) Census of India 1911, vol III, pt. I, Report, Assam. Assam Secretariat Press, Shillong
(1875) Memorandum of the Census of India, London 1871–72. Her Majesty's Stationary Office, London
Mipun BS (1997) Immigrants and agricultural changes in the Lower Brahmaputra valley: a case study of Darrang district. Ph.D. dissertation, North-Eastern Hill University, Shillong

Mullan CS (1932) Census of India 1931, vol III, Assam, pt. II, tables. Assam Secretariat Press, Shillong
Neufville JB (1828) On the geography and population of Assam. Asiat Res 16:33–52
O'Donnell CJ (1891) Census of India 1891, vol IV, The lower provinces of Bengal and their Feudatories
O'Donnell CJ (1893) Census of the lower provinces of Bengal. Bengal Secretariat Press, Calcutta
O'Malley LSS (1912) Census of India, vol V, Bengal, Bihar, Orissa and Sikkim, pt. I, report
Panda B, Mohapatra AC (2003) Disparity in literacy in the states of Arunachal Pradesh and Mizoram. In: Mohapatra AC, Pathak CR (eds) Economic liberalization and regional disparities in India: special focus on the North Eastern Region. Star Publishing House, Shillong, pp 193–98
Paul CR (1961) Census of India 1961, vol 26, pt. VI, Village Survey Monograph, Village Kamalghat
Paul CR (1967) Census of India 1961, vol XXVI, Tripura, pt. I (i), general report
Porter AE (1933) Census of India 1931, vol 5, Bengal Sikkim, Report and tables, Calcutta
Roy Burman BK (1970) Demographic and socio-economic profile of the hill areas of North-East India. Census of India 1961, New Delhi
Sikri DK (2001) Census of India. Scheduled Tribes Atlas
Sikri DK (2005) Census of India 2001, Tripura Administrative Atlas. Registrar General and Census Commissioner
Sinha M (2003) Tribal – non-Tribal boundaries in Assam with special reference to areas of Bodo concentration. Ph.D. dissertation North-Eastern Hill University, Shillong
Thompson WH (1923) Census of India 1921, Bengal, pt. I, report
www.mospi.gov.in (2006) Central Statistical Organisation, selected socio-economic statistics – percentage of population below poverty line (1999–2000)

Chapter 13
Migration and Its Impact on the Society and the Economy of North-East India

Abstract No other region of India has experienced such a huge, continuous and prolonged immigration as the North-East of India. Much of the brunt of this immigration is born by Assam, especially the Brahmaputra valley. There has been an equally intense immigration in Tripura during the last four decades, but Assam stands apart as a state, which has witnessed the severest impact of immigration from East Pakistan and subsequently Bangladesh. Starting from the recruitment of Bengali officials during the early years of British rule, continuing immigration as tea plantation workers and subsequently the peasants from Mymensingh looking for land to reclaim and settle in Assam – all have meant additional burden on the resources of the state. The population of immigrant Bangladeshi population has grown rapidly and has changed the demographic composition of the state. Today, in six districts of Assam, Muslims, with an inflated population because of illegal immigration from Bangladesh, form the majority religious group, and more districts are likely to turn into Muslim-majority districts. As a community, they have begun to exercise influence on the politics of the state. In the process of immigration, the Bangladeshi immigrants have suffered worst reprisals, but the immigration has continued unabated. The people of Assam perceive this illegal immigration as a threat to their economic security and cultural harmony. Another foreign immigrant group in Assam is that of Nepalis who are ubiquitous in all parts of the state but remain confined to service industry like transport and dairying.

The single most important factor that has contributed to this illegal mass exodus from Bangladesh to Assam is a steep population density gradient. While Bangladesh has a population density of over 1,000 persons to a km^2, Assam's density of population is less than 400 persons to a km^2.

Tripura is another state in the North-East which has experienced huge influx of Hindu refugees and illegal migrants. The immigrant population was accommodated in the state compassionately, though occasional violent clashes did occur between the original indigenous population and immigrant population. Following the adoption of Bengali language as the language of the state and Hinduism as the faith of the royalty, the erstwhile kings and their subjects willingly absorbed the

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cultural influences from Bengali Hindu society. It was not difficult to assimilate the immigrants in their fold. Today, unlike in Assam, the immigrant Bengali community contributes greatly to the economic and cultural development of the state.

Human migration, a common demographic phenomenon, involves the movement of individuals or communities from their place of residence to a new destination, with intent to settle there permanently or for a specific period of time. Such migrations could be voluntary or forced. There are many reasons for migration, but the underlying motivation, in most cases, is a quest for better opportunities, access to better resources and the promise of a better life. There could be other reasons as well that work as push factors. Poverty of resources, escape from persecution by the state or a hostile community and natural catastrophes like floods and droughts often work as push factors forcing a community to leave their hearth and settle elsewhere.

History is replete with instances of migration caused by situations ranging from religious persecution, conquest of a territory by some ambitious overlord, promise of a newly discovered land, some kind of El Dorado, visitation of natural calamities in successive years and, in the worst-case scenario, migration as an indentured labour or exiles from a state.

The most recent large-scale migration, almost a selective mass exodus that the Indian subcontinent witnessed, was following the partition of India into two nations, India and Pakistan in 1947, involving catastrophic migration of minority communities, Hindus and Muslims, each migrating to their preferred country – usually Hindus moving from Pakistan to India and the Muslims in the reverse direction. The propelling force, more than the motivation, was the combination of two factors, the perceived insecurity in the land of majority community and promise of better and harmonious life in the country of choice.

In contemporary Indian situation, the most common form of migration that materially affects the regional distribution of population and forms an important link in the process of industrialisation and urbanisation of the country is the rural–urban migration. Besides this, seasonal migration of farm labour during harvest season, as commonly witnessed in the mass of labour migrating to the Punjab from Bihar during summer, or that of graziers practising transhumance, between the plains during winter and higher altitude pastures during summer, is a common feature in some parts of India.

13.1 Migration in the North-East

In the context of North-East region of India, the most significant migration is the immigration in the region of people from other parts of India particularly the neighbouring states as well as the adjacent countries, specifically Bangladesh, Nepal and Myanmar.

The history of immigration in the North-East is long and sordid. It started with the recruitment of tea plantation workers in the mid-nineteenth century, degenerated into migration of East Bengal peasants reclaiming and colonising vast tracts of land in the western part of Assam, followed by a trail of refugee migration after the partition of the country and finally perpetuating itself as illegal migration from Bangladesh that has very adversely impacted the demography, economy and even social fabric of Assam. It must be stated that among the states in the North-East, Assam is the most affected, though Tripura has also experienced continued immigration, albeit of a different kind, which had only refugee immigrants, and not colonists.

13.1.1 A Historical View of Immigration in North-East India

Based on the instrument of immigration, the motivation of immigrants and the policy of the British Government, immigration could be put qualitatively and historically into five phases. Though these phases overlapped and occurred concurrently, qualitatively they were distinct in their purpose and motivation. These were:

1. Immigration of Bengali officials, recruited and employed by the British rulers, immediately after they took over the complete administration of Assam in 1826. Acquainted as they were with British administration, they were to help the colonial government in running the administration of the province. They came largely from Sylhet.
2. Recruitment and immigration of tea plantation workers labelled as 'tea garden coolies' from Bengal and the neighbouring provinces. This continued almost uninterrupted for 50 years from 1880 to 1930.
3. An immigration of Bengali peasants, parallel to one above, largely from Mymensingh district in Assam. These were the colonists who migrated with a clear intent of settling in Assam. The sequential process was to establish their foothold somewhere, reclaim wasteland, cultivate and develop their own permanent settlements. These immigrants never returned and settled in Assam.
4. Refugees from East Pakistan (now Bangladesh) after the partition of the country in 1947. The wave of refugees consisting largely of Hindus lasted for a few years. The impact of this migration was most felt in the two states of the North-East, viz. Assam and Tripura in the East and West Bengal in the West.
5. Post-partition illegal migration from East Pakistani peasants – This was the most dangerous phase of immigration, which got accentuated after 1971 war when hordes of Pakistanis migrated to Assam on the pretext of escape from the brutality of the Pakistani army. This stream of immigration continued till the 1980s of the last century, when an anti-immigration movement in Assam vigorously opposed and resisted illegal immigration.

A concurrent immigration of Nepali graziers though not as numerous as the Bangladeshis can be mentioned. The Nepali immigrants are a ubiquitous sight in the

North-East and are spread in all the states of the region, though their greatest concentration is in Assam.

These five phases are qualitatively different though not always differentiated. It may be mentioned that Guha (1978:44) recognises only four principal streams of immigrants. He does not consider the early Bengali settlers of Assam as a part of the immigrant stream. These were the people recruited by the British administration, the lower rung of which consisted almost solely of Bengali Hindus imported from Sylhet (Sharma 1980).

13.1.1.1 Early Immigration of Bengali Officials

These early migrants consisting largely of educated middle class Bengalis, though relatively small in number, wielded considerable influence in administration and in the course of time grew in strength, large enough to assume an independent sociocultural identity in the province. Besides their dislike of the bureaucratic dominance of the Bengali community during the early part of the British rule, the Assamese society, especially the peasantry, also held a mute and unremitted resentment against the Bengali community for their role in foisting Bengali as the official language in Assam and making it the medium of instruction in schools, in the 1830s. It was only in 1874 that Assamese could resume its rightful place as a medium of instruction in schools, through the pioneering effort of Anandaram Dhekial Phukan who convinced the authorities, particularly the Sadar Diwani judge of Calcutta, A. J. Moffat Mills, of the point of view that Bengali was alien to the culture of the people of Assam and its use as a medium of instruction was an imposition of a foreign language. This is a century-old story but is quoted even today as illustrative of Bengali domination of Assam in the early days of British rule. The Assamese, in general, are not reconciled to this historic injustice meted out to them, and their resentment, at times, erupts into clear hostility toward non-Assamese communities, as seen in the movement of the 1980s.

Secondly, Guha has not paid attention to the latest invisible stream of illegal immigrants who are different from the category of displaced Hindu refugees. There is no doubt that continuous illegal immigration of Bangladeshi in Assam is very significant and has, more than any other factor, adversely influenced the social fabric of the state, creating a state of perpetual tension and posing a threat to the economic security of the peasant community in the state. It is the economic rise of the immigrants and their growing influence in the politics of the state that combined to trigger the anti-non-Assamese movement in Assam, in the mid-1980s of the last century.

The tea plantation workers and Nepali graziers, though substantial in number, did not pose a challenge to what Guha calls ‘autochtone Assamese’. It is the immigrant Muslims from Bengal who occupied large chunks of land, who, having attained some level of prosperity, pose a threat to the traditional cultural identity of Assam.

13.2 Migration during the British Period

There is justification for treating the migration during the British period, distinct from the subsequent migrations. Before 1947, the source and destination of much of the immigrant population lay in the same country, India, and movement from one part to the other was perfectly legal, though it may have been to the dislike of the people of the host regions.

13.2.1 Initiation of Immigration in the Mid-Nineteenth Century

Much of the information that is available on immigration – past and present – comes from Indian census reports that not only paid attention to the migration aspect of demography but also commented on the qualitative, quantitative and spatial aspects of migration. Immediately after Assam Tea Co. was formed in 1839, a number of tea gardens emerged in upper Brahmaputra valley, and by mid-nineteenth century, the need to import labour was felt. There are conflicting views about the reasons for importing labour from outside the province in preference to local recruitment. According to official British sources, 'There are very few landless labourers in Assam and people who have land naturally prefer the independence and ease of their position as cultivators to the discipline and labour of tea gardens. It was found necessary, at a very early stage, to seek teagarden coolies elsewhere' (Gait 1906:354). Contrary to this view, Misra (1980) writes that 'Tea garden managements in Assam have traditionally avoided employing local Assamese hands, and the Assamese villagers being adjacent to the vast stretches of tea gardens have been accepting this as a common natural phenomenon. While an occasional local village youth might secure some clerical position in a nearby teagarden, the majority of villagers have not looked upon tea gardens as a possible venue for employment'. Misra quotes the case of Madhu Koch who in 1858 had led a revolt of tea labourers against the horrible exploitation by the British planters. Madhu Koch was sentenced to 8 years rigorous imprisonment and peace was restored, but the British had learnt the lesson, and from then onward they followed a policy of deliberately discouraging the recruitment of local labour. Misra's contention appears plausible, yet it may be added that there was, certainly, some recruitment of local labour in the twenties of the last century, though not at a large scale.

In 1853, the Assam Tea Co. began importing labour from Bengal. To facilitate this, a series of enactments were brought fourth that, among other provisions, included ones that could ensure to the employer the services of the labourers imported by him for a period sufficiently long to enable him to recoup the cost of recruitment and bringing them to the garden. In reality, however, the recruitment of plantation workers was badly organised. It was done through contractors called 'coolie catchers', an offensive word, and *sardars* who were old tea garden labourers.

Table 13.1 Immigrant population in Assam in 1881

	No. of persons	Percentage of population
1. Population in Assam in 1881	4,881,426	100.00
2. Population born in the province	4,600,426	94.24
3. Population born outside the province	281,000	5.76
(a) Immigrants from Bengal	172,000	3.52
(b) Immigrants from other provinces	109,000	2.24

Source: Lyall (1883)

The entire family of the recruited labour was transported. Dhubri was the gateway to Assam where the contractor handed over the coolies to garden authorities. Initially, the contracts with the plantation workers used to be long-term contracts, but during 1920s, short-term contracts were also given and the coolies were allowed to return on a 'Sardari Certificate', meaning that the persons returning home are labour contractors and should be allowed to return. A very sad chapter in the recruitment process was the death of coolies, some during transport and a large number even on tea gardens. In Assam valley, the number of coolies lost by death was sometimes as much as the number of fresh arrivals. For instance, in 1920–1921, 21,000 coolies were imported in Brahmaputra valley, while the number lost stood at 20,000 (Census of India 1931a). In the decade 1920–1930, there was not a single year where at least 15,000 coolies did not die on tea plantations, often due to *kala-azar* (black fever), malaria and dysentery.

13.2.2 Influx of Plantation Workers

The recruitment of plantation workers started quite early, not much after the opening of the first tea gardens in Lakhimpur district in 1835. The cultivation of tea in Cachar started much later in 1856. The process picked up in the latter half of the nineteenth century. This could be seen from the record of population born outside the province of Assam, available since 1881, the year of the first Census of India (Table 13.1). In 1881, out of a population of nearly five million, 281,000 people were born outside the province of Assam.

Bengal province, in 1881, was a much larger entity and included the adjacent provinces of Bihar and Orissa. North-West Frontier Province and Oudh was the province known presently as Uttar Pradesh. Thus, even as early as 1880, the principal source of labour was Bengal (the subsequent British provinces of Bengal, Bihar and Orissa) and Uttar Pradesh, especially its eastern districts. As the demand for labour in the tea gardens grew, there appeared a progressive and accelerated increase in recruitment and immigration. The field of recruitment also expanded which included, besides Bengal and U. P., other areas like Central Provinces, Madras, Nepal, Rewa, Rajputana and several other districts of Central India Agency.

13.2.3 Early Twentieth Century: The Critical Years in the History of Immigration in Assam

The early years of the twentieth century witnessed an accelerated increase in the immigrant population in Assam. Other states of the North-East were, then, constituent units of Assam. The princely states of Manipur and Tripura were not in the reckoning as far as tea plantation was concerned. While the population of the province grew between 1881 and 1901 from 4,881,426 to 6,126,348, showing an increase of hardly 25 %, over a period of two decades, the immigrant population, as suggested by the number of people born outside the province, multiplied almost three times, from 281,000 in 1881 to 775,844 in 1901.

13.2.3.1 Labour Recruitment Field of Assam Tea Plantation

As seen earlier, the tea plantation depended for their labour supply on the neighbouring provinces, principally Bengal, Orissa, Bihar and Uttar Pradesh. But as the demand increased, they were drafted from further afield, like Madras Presidency and even Punjab. This is reflected in the place of birth of plantation workers, a fact regularly recorded in the provincial census reports decade after decade (Table 13.2). For all practical purposes, the number of persons born outside the province is taken as the number of immigrants (Fig. 13.1).

Bengal, lying in close proximity of Assam and sharing a common border, was the largest supplier of plantation labour. Some parts of Bengal, especially the tribal districts of Chota Nagpur and Orissa, contributed a much larger share. The three districts of Lohardaga, Hazaribagh and Manbhum together contributed around 45 % of the total labour force coming from Calcutta. The remaining half came from Patna, Bhagalpur and Burdwan districts. The Uttar Pradesh districts of Ghazipur, Azamgarh and Jaunpur accounted for 10 % of the total labour force. The eastern districts of Bengal, viz. Dacca, Rajshahi, Chittagong and some others, contributed only 16 % of the labour force.

An important aspect of immigration from Bengal is the composition of the immigration stream. A large number of migrants, particularly from the districts bordering Assam, like Mymensingh, Rangpur, Dacca and Tipperah (now Tripura), did not join the stream of plantation workers. These were largely land-hungry peasants who looked for land to be reclaimed and cultivated. Many of them arrived in Assam as coolies but soon settled down in rural areas. Writing in 1911, McSwiney (1912) observed that 'the last decade has witnessed a large number of immigrants from the neighbouring districts of Bengal in the riverain areas of Goalpara'. Many of these immigrants had a short stint as coolies and then settled down to farming. The Revenue Department of Assam estimated that 95,091 acres of land were held by ex-garden coolies in 1900–1901. This was a considerable increase over 23,953 acres, the area that was occupied by immigrant coolies in 1890–1891 (Census of India 1911).

The immigration of Bengal peasants with an intent to reclaim and colonise the land started in the beginning of the nineteenth century, and what started as a trickle

Table 13.2 Statement showing the number of immigrants in Assam in 1901 (based on the place of birth)

Province or princely state where the immigrant was born	Number of persons born in specific province	Percentage of immigrants born in a province of the total number of immigrants	Principal districts of recruitment in the province
A. Indian provinces and states			
Bengal	501,743	64.67	Lohardaga, Manbhum, Hazaribagh, Mymensingh Rangpur
North-western Provinces (Uttar Pradesh)	108,900	14.03	Ghazipur, Azamgarh, Jaunpur
Central Provinces	84,170	10.84	Bilaspur, Jubbulpore (Jabalpur), Sambalpur
Madras Presidency	21,571	2.78	Ganjam
Punjab	6,214	0.82	
Bombay Presidency	1,407	0.18	
Rewa	10,274	1.32	A princely state in Central India Agency
Subtotal	**734,279**	**94.64**	
B. Foreign countries			
Nepal	21,347	2.76	
Afghanistan	1,101	0.14	
Burma	1,666	0.22	
Bhutan	919	0.12	
Baluchistan	655	0.09	
Europeans	1,340	0.15	
Others	14,537	1.87	
Subtotal	**41,565**	**5.35**	
Total	**775,844**	**99.99**	

Source: Census of India (1901)
Note: Bengal in 1901 included Orissa as well as Bihar; Madras Presidency included Andhra Pradesh as well as Karnataka

in the general stream of tea garden coolies grew into an uninterrupted stream for several decades that not only transformed the character of land use in the Brahmaputra valley bringing more land under plough but also resulted in a gradual change in the demographic composition of the population giving rise to social tension manifest in the occasional eruption of violence and riots.

13.3 Migration in the North-East in the Twentieth Century: Volume, Source and Destination

Though migration is used as a general term for the movement of people, it is essentially the immigration that is a predominant feature of population movement in the North-Eastern region. Much of the change in the demographic character of that has

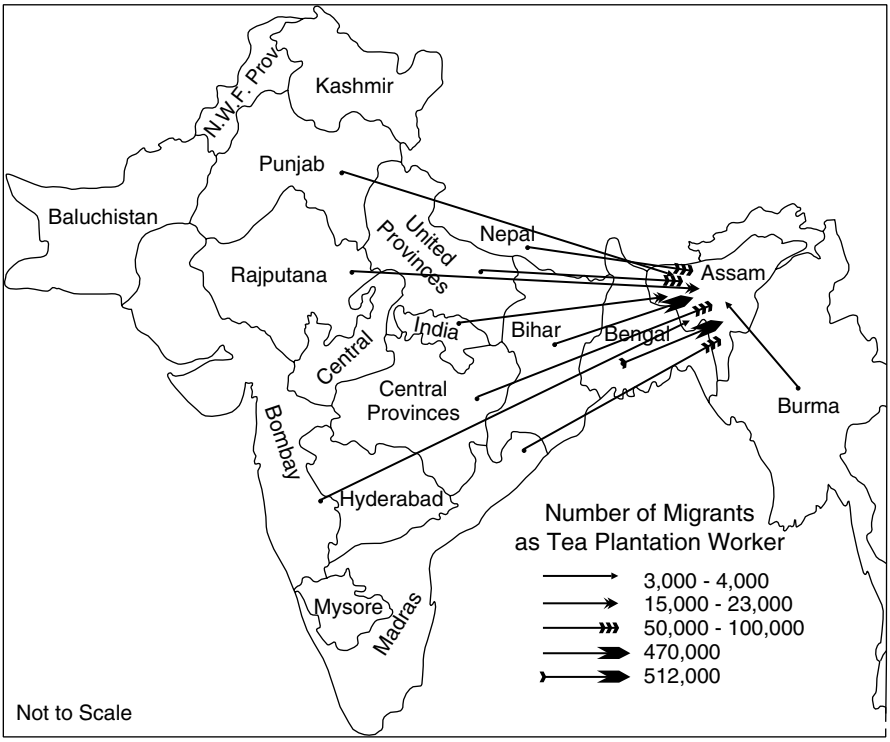

Fig. 13.1 Tributary area for the recruitment of tea plantation workers for the tea gardens of Assam – 1931 (Adapted from Census of India 1931b)

resulted in the North-East is primarily because of immigration from other parts of India and the neighbouring countries like Pakistan, now Bangladesh, Nepal and to some extent Myanmar.

The nature of immigration has varied significantly from pre-independence to post-independence period in Indian history and then in the aftermath of the creation of Bangladesh. The discussion of the subject is organised in three parts – immigration before 1947, the year of India's partition; immigration during the post-partition period (1947–1971); and immigration after the creation of Bangladesh in 1971.

13.3.1 Immigration During the First Half of the Twentieth Century

The immigration that took place during this period had multiple shades depending upon purpose of migration, place of origin and destination and the community involved. While deciphering the type and volume of migration in the twentieth century, one has to bear in mind the change of territorial organisation that took place in the nineteenth century. Till 1872, Cachar and Sylhet, the two districts of Surma

valley, were a part of Dacca Commissionerate, and Goalpara was attached to the Commissionerate of Cooch Behar. By 1881, these districts were merged into the province of Assam headed by a chief commissioner.

13.3.1.1 Source and Quality of Data

Most population studies in India including migration depend on data published by the Census of India decennially, starting from 1881 till date. Much of the data that is advanced on 'migration' is based on the 'place of birth' statistics. A person born outside a province is counted an immigrant to the province. Such data were collected and have been published ever since 1881, the year of the first Census of India. In the case of Assam, however, there was no census in 1981 because of unrest during the movement against illegal migration.

During the British rule, there was a Labour Board in Assam, presided over by a Chairman that published periodically or even annually Immigrant Labour Reports that gave a reliable figure of the number of people who were recruited as labour, especially for tea plantation. Early census reports also compiled the data relating to the number of immigrants as well as emigrants, natural increase of population and the actual number that was added to the population. What is published now is the 'place of birth' by province or state or the 'place of last residence and duration of stay in the place of enumeration'. Both these data – 'place of birth and the place of last residence and duration of stay at the place of enumeration' – are utilised for tracing the place of origin of the immigrants and estimating the number of immigrants. The reliability of these data depends squarely on the skill and accuracy of the enumerators and 'the response of individuals obtained in a data sheer'. It would be naive to believe that all the immigrants reveal correct information and don't hide the ones that put them to them to the risk of deportation.

13.3.1.2 Migration Calculated on the Basis of Place of Birth

This implies that a person not born within the limits of the state is an immigrant in that state. The place of birth gives the origin of immigrants and the place of enumeration as their destination. Collectively, these data give a fairly good idea of the number, the origin and the present place of enumeration of the immigrants.

The Census of India distinguishes the following categories of immigrants based on the place of birth[1]:

A. Persons born in India

   I. Within the state of enumeration

      (a) Born within the district of enumeration

[1] Based on Census of India (1951).

(b) Born in a district of the state, other than the district of enumeration

II. Born in any other state of India beyond the state of enumeration

(a) Born in a state, adjacent to the state of enumeration
(b) Other states of India

B. Countries of Asia beyond India (including USSR)
C. Countries in Europe
D. Countries in Africa
E. Countries in America
F. Countries in Australia and Oceania
G. Birth place not stated

13.3.1.3 Migration Calculated on the Basis of Last Place of Residence and Duration of Stay at the Place of Enumeration

This method was introduced in 1991. The method has some advantages, but equally some disadvantage. The advantage is seen in the break-up of the duration of stay at the place of enumeration that suggests the trend of immigration. A mention of only the place of birth does not suggest whether the immigration is continuing with an increasing or declining trend. The drawback of the method, on the other hand, is the possibility of masking the actual origin of migration in situations of multistage immigration, a phenomenon quite common in Assam. An ideal situation would be to combine the two methods that could provide actual number of immigrants based on place of birth and the trend based on the duration of stay at the place of enumeration.

13.3.1.4 Immigration in Assam in the First Half of the Twentieth Century

Table 13.3 shows the number of people who migrated to Assam, as suggested by the place of their birth, in successive decades. The immigrant population has two major components – those who were born in other states of India and those born abroad. The latter category includes also the population displaced from East or West Pakistan. Since the immigration data is based on the place of birth, no distinction is drawn between the displaced persons and other immigrants. The number of immigrants, based on the place of birth, as given in the table includes the number of displaced persons who migrated to Assam between 1946 and 1951.

13.3.1.5 Displaced Persons

The states of India in proximity to the two wings of Pakistan, East and West Pakistan, experienced a huge influx of refugees, following the partition of the country. Assam

Table 13.3 Immigration in Assam based on place of birth, as recorded in successive decades

Year	Population of Assam	Persons born in Assam	Persons born outside Assam	Persons born in other states of India	Persons born outside India	Persons born in Pakistan	Persons born in Nepal	Persons born in Europe
1901	5,841,877	5,066,033	775,844	748,488	27,356	–	–	1,340
In %	100	86.7	13.28	12.8	0.46			
1911	7,059,857	6,177,375	882,482	811,884	70,598	–	–	–
In %	100	87.5	12.5	11.8	0.7			
1921	7,990,246	6,700,089	1,290,157	1,218,661	73,496	–	70,000	–
In %	100	83.85	16.14	15.22	0.92			
1931	9,247,857	7,839,094	1,408,763	1,314,00	94,763	–	88,000	–
In %	100	84.8	15.2	14.2	1.0			
1941	10,930,388	Tea garden population 1,134,034 or 10.37 % of total population of the province					–	–
	100							
1947	Partition of India							
1951	9,043,707	7,699,759	1,343,803	447,414	896,389	833,288	56,572	3,396
In %	100	85.15	14.85	4.95	9.9	9.21	0.69	0.04

Sources:
Census of India (1901:33–37)
Census of India (1901, Assam, vol. IV, tables, pp. 63–69)
Census of India (1911, vol. III Assam, Report, pp. 1–10)
Census of India (1921, vol. III Assam, pt. II, tables, pp. 67–85)
Census of India (1931, vol. III Assam pt. I-A, Report, pp. 43–53)
Census of India (1941, vol. IX, Assam tables)
Census of India (1951)

being one of the border Indian states of East Pakistan received a large number of refugees. The Census of 1951 for Assam has published data about displaced persons from East as well as West Pakistan. Persons displaced following India's partition in 1947, commonly recognised as refugees, are enumerated separately and have a distinct category in the Indian census. The number of persons not born in Assam but enumerated in Assam in 1951 was 833,288, including 278,287 displaced persons who arrived in Assam between 1946 and 1951. This should not appear paradoxical, as the data about the displaced persons refers to a specific period (1946–1951), while the total number of persons born in Pakistan, now in Assam, has no reference to any specific period and reflects the cumulative effect of immigration over the decades.

As can be seen from the Table 13.3, right from the opening years of the twentieth century, there has been a progressive increase in the number of people born outside the province, both in terms of absolute number and in proportion to the total population. Gradually rising from 13.2 % in 1901, the percentage of people born outside the state reached 16.1 % in 1921, the highest in the first half of the century. In terms of absolute number, the highest number of persons outside the province was 1.41 million in 1931. The immigration of land-seeking peasants from Bengal continued even after 1931, but recruitment of tea plantation workers appears to have virtually stopped. There were two reasons for it: firstly, the attention of the government was divided to war efforts in the Eastern theatre during the Second World War particularly in the closing years of the census decade 1931–1941, and secondly, there was recruitment over the preceding 40–50 years to arrive numerically at a critical mass of tea garden population that sustained itself, providing the labour needed to the industry, without having to resort to fresh recruitment. This shows in the tea garden population of the province, numbering 1,134,034[2] that formed over 10 % of the total population of the province.

13.3.1.6 Tea Garden Population in 1941

In the simplified census that was conducted in the province in 1941, 1216 tea gardens were recorded in Assam having a population of 1,134,034 with 600,653 males and 533,381 females, showing a sex ratio of 888 females per 1,000 males. This may not appear very healthy, yet it could ensure a regular supply of labour to the tea plantations, generation after generation. Even today, one finds in the coolie lines of Assam people whose ancestors migrated to a specific plantation a 100 years ago. The partition and consequently the hiving off of much of the area of Sylhet district to be transferred to Pakistan brought down the population of the state. The decline in the number of persons born outside the state as recorded in 1951 is a reflection of the overall decline of population, following the transfer of Sylhet district to Pakistan.

The most significant change in 1951 was the change in the composition of immigrant population. The immigrant population was dominated till 1947 by the

[2] Census of India (1951).

Table 13.4 The Immigration field of Assam in India

State/countries	No. of migrants enumerated in different years			
	1921	1931	1951	Remarks about 1951 figures
Bengal	376,000	575,000	23,454	Only W. Bengal
Bihar and Orissa	57,000	472,000		
Central Provinces	91,000	82,000	33,960	Includes M. P. and Madhya Bharat
Madras	55,000	58,000	12,719	
Uttar Pradesh	77,000	68,000	33,463	
Central India Agency	18,000	15,000	–	
Rajputana	16,000	22,000	17,280	Rajasthan
Burma	7,000	8,000	–	
Bombay	1,000	6,000	4,786	
Punjab	8,000	6,000	5,508	East Punjab
Tripura	–	–	15,098	
Bihar	–	–	206,346	
Orissa	–	–	86,216	
Others	2,000	–	8,584	
Total	1,217,000	1,314,000	447,414	
Nepal	77,000	88,000	–	

Sources:
Lloyd, O. T., Census of India (1921, vol. III Assam, pp. 67–85)
Census of India (1931a:43)
Census of India (1951)

people born in other parts of India and was suddenly transformed, showing a preponderance of foreign-born population. All such people who were born in East Pakistan were considered as foreigners giving a composition in which foreign-born immigrants far exceeded the immigrants from other states of India. Their number was more than double the number of migrants from other states of India and formed almost 10 % of the total population of Assam. The decline in the number of immigrants, from other states of India, is obviously the result of the end of recruitment of garden coolies. The number of domestic immigrants from other parts of India had not increased much even till 1961. A modest increase can be accounted for by the arrival of refugees.

13.3.2 Tributary Area of Immigration

The tributary area or the field of immigration, implying the provinces and the centres from where the people arrived, has not changed much from what it was in 1931 (Table 13.4). Till 1947, the only foreigners that formed part of the immigration stream were the Nepalis, Burmese and some Europeans who owned or worked in the plantations, besides others who were employed administration. Because of the stoppage of import of coolies, the number of persons born outside in other states of

Table 13.5 Foreign immigrants in Assam, Tripura and Manipur in 1951

Countries	Number of immigrants					
	Assam		Tripura		Manipur	
Countries in Asia beyond India	894,607	% of the total Asian population beyond India 100 %	210,568	In percent 100.00	2,075	In percent 100.00
1. Burma	3,296	<1 %	122	0.05	256	12.30
2. Nepal	56,572	6.32	270	0.12	424	20.40
3. Pakistan	833,288	93.1	210,161	99.80	1,394	67.20
4. Bhutan	378	<1 %	–	–	–	–
5. Tibet	102	<1 %	15	–	1	–
6. China	378	<1 %	–	–	–	–
Countries of Europe	1,540		12			
UK	1,308		12			
USA	144					

Source: Census of India (1951, vol. II, Assam, Manipur and Tripura, pt. II, tables, pp. 112–135)

India but to be enumerated in Assam was much less than what it was in 1931. But it is more than compensated by the immigrants from foreign countries, notably East Pakistan (now Bangladesh), as immigration from eastern part of Bengal never stopped as it had nothing to do with tea gardens and represented only immigration of peasants, from the neighbouring districts of Bengal (Table 13.5).

13.3.2.1 Change in the Tributary Area of Immigration in Assam

The picture of migration in the North-East, especially Assam, is very different from what was in 1931. The number of migrants from foreign countries is almost double of what it was in 1931. A large mass of immigration took place from East Pakistan after 1947. While in 1931, the undivided Bengal contributed 575,000 immigrants in 1951, the immigration from the same area that comprised West Bengal and East Pakistan showed an increase of around 50 %. And, while the immigration from West Bengal was reduced to a trickle, it was compensated by a torrent of migrants from East Pakistan, the erstwhile East Bengal. It appears that between 1947 and 1951, the peasants of East Pakistan, sensing it as the last opportunity, though it was not the last, migrated to Assam joining the caravan of refugees who were fleeing East Pakistan.

The important states that contributed to the migration stream are Bihar, Bengal, Orissa and Uttar Pradesh. Bihar occupied the top of the table in the numerical strength of migrant workers employed in tea plantation. But as the nature of migrants changed and more peasants started moving into Assam valley, Bengal became the leader, followed by Bihar and Orissa, Central Provinces and Uttar Pradesh. The year 1921 is the watershed that distinguishes the plantation workers

of pre-1931 from the land settlers that started streaming in from Bengal during the 1921–1931 decade. In 1901, the principal districts from which plantation coolies arrived were Lohardaga, Manbhum and Hazaribagh, while persons other than coolies were most numerous from Mymensingh, Rangpur, Dacca and Tipperah. The most significant feature of post-partition migration is the immigration of over a million people in Assam between 1947 and 1951 and the continuing stream of illegal immigration that never ceased.

13.3.3 Immigration Scenario in the Hilly States of North-East India as seen in 1951

Following the country's partition a large-scale emigration from East Pakistan, the erstwhile Bengal, took place, and a large part of it moved eastward to Tripura and Assam, the two neighbouring states.

In Assam in 1951, the population born outside the state amounted to 14.86 %. Much of this was the immigrant population from East Pakistan as shown in Table 13.6:

In the year 1951, the number of people born outside Assam was over 1.3 million (1,343,948). This constituted about 15 % of the total population of the state. Of this, one-third was the population born in one or the other of Indian states, beyond Assam, while the remaining two-thirds (900,000) arrived from the neighbouring countries of Pakistan, Nepal and Burma. Ninety-three percent of the immigrant population from beyond the Indian borders came from East Pakistan, now Bangladesh; over 6 % from Nepal; and a few thousand from Burma, now Myanmar. About one tenth of the total population of Assam consisted of people who were born in East Pakistan. There is no doubt that the people of Bengali origin were much larger in number and it is clear from the number of people speaking Bengali as their mother tongue. The total number of people speaking Bengali as their mother tongue was 1,719,155 that formed 19 % of the population of Assam. If one separates the people having their birth place in Pakistan, one would arrive at a figure that is practically half the total population speaking Bengali as their mother tongue.

No. of people having Bengali as their mother tongue in Assam in 1951	1,719,155	100 %
No. of persons with their birth place in East Pakistan	833,328	48.47 %
No. of Bengali speaking people born in Assam	885,829	51.52 %

13.3.3.1 Immigration in Other Parts of the North-East

Before 1947, Assam was a monolithic block comprising the present area of Assam, Nagaland, Mizoram and Meghalaya as its constituent units. The princely states of

Table 13.6 Immigrant population in Assam in 1951

Population in 1951	No. of people born outside the state	Population born in other states of India	Population born abroad	Population born in Pakistan (% of total foreign population)	Population born in Nepal	Population born in Burma	Population born in Europe	Birth not specified
9,043,707	1,343,948	447,414	896,534	833,328	56,572	3,296	1,540	387
	14.86 %	4.94 %	9.91 %	9.21 %	0.62 %	0.04 %	0.017 %	

Source: Census of India (1951:118, 124)

Manipur and Tripura were outside the domain of Assam and so was much of the present Arunachal Pradesh. The story of immigration in Tripura is as old as that of Assam, albeit of a different nature. Tripura did not import tea plantation labour. The immigrants arrived there to settle down to farming. The other states Nagaland, Mizoram and Meghalaya, the erstwhile districts of Assam, did not attract many immigrants. These latter states neither had large tea plantations requiring a labour force nor did they have fertile alluvial plains to attract peasant immigrants, as was the case with Brahmaputra and Barak valleys.

In the wake of partition of India in 1947 and the disturbances that followed, these areas also received immigrants, though not in such large numbers as Assam and Tripura. This can be seen in the records in 1951 (Table 13.7).

Another important reason why the hilly areas of Nagaland, Mizoram and Meghalaya were not mobbed was the restrictive Bengal regulation of 1873, known as 'inner line' restriction which stipulated that the plainsmen could not cross the borders of these well-defined secluded areas without proper permission. The case of Tripura, as will be seen later, was altogether different. Besides Assam and Tripura, the two North-Eastern states which were most affected by partition and the influx of immigration, some other hilly areas also experienced some impact. Of these, Meghalaya, then known as United Khasi and Jaintia Hills and Garo Hills, had a fair share of immigrants. The emigrants from East Pakistan also reached North Cachar Hills, Lushai Hills (now Mizoram) and even Naga Hills, and some penetrated as far as Mishmi Hills and Tirap and Balipara Frontier areas of Arunachal Pradesh. Mizoram had a shared border with East Pakistan, and Barak valley provided a natural passage for the immigrants to reach Nagaland. Garo Hills and Khasi and Jaintia districts being on the border of East Pakistan (now Bangladesh) had the maximum impact. In 1951, about 7% of the total population of Meghalaya consisted of immigrants of whom about 4.5% were of Pakistani origin.

13.3.3.2 The Case of Tripura

The story of Tripura is similar to Assam in terms of continuing immigration in the twentieth century (Table 13.8). The difference lies in a much lower density of population in the state with the capacity to absorb additional population and the degree of tolerance and the inclination to accommodate and assimilate the immigrant population. While in the case of Assam, it has led to resistance, tension, riots and occasional massacre of immigrant population; in Tripura, the resistance has been subdued with occasional violence. Secondly, the resistance in Tripura has been largely from the indigenous population, whereas in the case of Assam, there was hardly any. Tripura, like Assam, experienced huge immigration all through the twentieth century, but it had nothing to do with tea plantation. The process of immigration has to be seen against a background of a princely state ruled by a king who had adopted Hinduism as his faith and Bengali as the language of the state. This encouraged a selective immigration in which Hindus were predominant. Starting in the beginning of the last century, the immigration had a surge after 1947 when

Table 13.7 Immigration in the hilly states of the North-East during the 1947–1951 period

District/state	Population 1951	Persons born in other Indian states	Total population born outside the state	Persons born in other countries Asia (% of total population)	Persons born in Pakistan (% of people born outside India)	Nepal	Burma	Countries of Europe
1. United Khasi–Jaintia Hills	363,599	10,112	36,270 (9.95 %)	26,049 (7.16 %)	16,157 (62 %)	9,496 (36 %)	238	175
2. Garo Hills	242,075	588	8,926 (3.68 %)	8,335	6,976 (83.7 %)	355 (16.25 %)	–	3
3. Naga Hills (Nagaland)	205,950	1,392	3,798 (1.8 %)	2,400	1,416 (61 %)	937 (39 %)	30	6
4. Lushai Hills (Mizoram)	196,202	554	10,360 (5.2 %)	9,786	6,512 (67 %)	1,633 (16.6 %)	1,637 (16.7 %)	20
5. United Mikir and N. Cachar Hills	165,440	1,652	5,375 (3.2 %)	3,666	3,322 (90.6 %)	323 (8.8 %)	11	7
6. Mishmi Hills	32,163	2,847	6,178 (19.2 %)	3,331	872 (26.1 %)	2,358 (70.8 %)	51	–
7. Abor Hills	10,761	837	1,456 (13.5 %)	613	289	289	8	6
8. Tirap Frontier	5,213	57	1,253 (24.0 %)	645	225	358	33	2
9. Balipara Frontier	9,721	1,407	2,816 (29 %)	1,408	103	1,300 (92.3 %)	2	1
10. Manipur	577,635	4,204	6,279 (1.08 %)	2,075	1,394 (67.2 %)	424 (20.4 %)	256	–
11. Tripura	639,029	18,509	229,089 (35.8 %)	210,568	210,161 (99 %)	270	122	12
12. Assam	9,043,707	447,414	–	894,607	833,328 (93.15 %)	56,572 (5.06 %)	3,296 (0.4 %)	–

Source: Census of India (1951, vol. VII, Assam, Manipur and Tripura, pp. 112–135)

Table 13.8 Immigration in Tripura

Year	Total population of the state	Immigrant population	Percentage of total population
1891	137,442	33,328	24.24
1901	173,325	43,894	25.32
1911	229,613	81,663	35.50
1921	304,437	96,386	31.66
1931	382,450	114,450	29.92
1951	637,029	229,977	36.10

Sources:
Census of India 1891, vol. IV The Lower provinces of Bengal and their Feudatories, Calcutta 1893, p. 389 by C J O'Donnell
Census of India 1901, vol. VI, Lower provinces of Bengal and their Feudatories – Hill Tippera, pt. I, p. 82 by E A Gait
Census of India 1911, vol. V, Bengal, Bihar, Orissa, Sikkim, pt. I, p. 117, Report by L S S O'Malley
Census of India 1921, vol. V Bengal, pt. II, tables, p. 146 by W H Thompson, Calcutta, 1923
Census of India 1931, Bengal and Sikkim, p. 104, by A E Porter, Calcutta, 1933
Census of India (1951:123, 129)

Bengali refugees from the adjacent districts of East Pakistan poured in. As the population of Hindus increased, more and more Hindus joined the refugee stream, causing an increase in the percentage of immigrant population. The highest recorded immigrant population in the state was noticed in 1951 when the immigrants formed 36 % of the total population of the state.

Despite a recurrent immigration from Bengal in Tripura, there was never witnessed a hue and cry that characterised the arrival of East Pakistanis, now Bangladeshi immigrants. There are two specific reasons: the immigrants in Tripura, especially after 1947, were genuinely refugees, unlike the peasant immigrants of Bangladesh in Assam who frequently arrived as colonisers. Secondly, the sociocultural background of the immigrants in Tripura was similar to a large mass of nontribal population that had, following the royal charter, adopted Bengali as a language and Hinduism as their faith. Even before the huge influx of Bengali-speaking Hindu population, there was a large mass of literate Bengali population settled in the state over decades, from the beginning of the nineteenth century, and the fresh arrivals received a welcome treatment. Most of the Bengali-speaking population of Tripura has its roots in Bengal deriving its inspiration from Bengali literature and culture and has struggled to create a society that is progressive in outlook and has adopted modern science and education as a means to promote a welfare state.

13.3.3.3 Displaced Persons (Refugees) as Immigrants in Assam, Manipur and Tripura

The total number of displaced persons officially recorded in Assam is almost one-third of the number recorded as having their birth place in Pakistan.

Table 13.9 Displaced persons arriving in the North-East region between 1946 and 1951/1952

	Number of displaced persons in different states				
Year	Assam	Tripura	Manipur	Total	Percentage of total arrival
1946	6,860	3,317	24	10,201	2.72
1947	42,747	8,125	197	51,069	13.63
1948	41,831	9,554	107	51,492	13.74
1949	33,209	10,575	106	43,890	11.72
1950	144,580	67,151	569	212,232	56.61
1951	3,495	2,096	8	5,599	1.49
Total	272,722	100,818	1,011	374,551	99.90

Source: Census of India (1951:138)

A displaced person as defined by the Government of India is 'any person who has entered India having left or being compelled to leave his or her home in Western or Eastern Pakistan on or after 1st March 1947, or his her home in Eastern Pakistan on or after 15th October 1946, on account of civil disturbances or fear of such disturbances or on account of civil setting of two dominions of India and Pakistan', Census of India (1951:138)

Ibid pp. 136–139

Displaced persons in the two princely states are also recorded. Though the number of immigrants, recorded as displaced persons, is divided according to their origin from East and West Pakistan, the number of people arriving from West Pakistan was negligible, confined only to Assam (Table 13.9). In all, 374,551 persons arrived in the North-East, largely Assam and Tripura, between 1946 and 1951.

Following the disturbed conditions and communal riots in East Bengal, the refugees started arriving in Tripura and Assam in 1946, with a manifold increase in their number in subsequent years. The year 1950 was the most crucial year when there was a torrent of refugees and over 200,000 displaced persons arrived from East Pakistan. It is quite likely that the Government of India declared a time limit beyond which no more displaced persons were to be accepted. The result was a rush in 1950 that witnessed a huge influx of refugees in Assam and Tripura.

The displaced persons were not uniformly distributed over the entire state. In Assam, where 272,722 refugees forming 72 % of the entire mass arrived, a few districts like Cachar, Goalpara and Kamrup had the maximum impact, receiving, respectively, 34, 17 and 16 of the total number of refugees. These were the districts closest to East Pakistan and easily accessible. Some of these like Cachar, Goalpara, and Garo, Khasi and Jaintia hills were contiguous to Pakistan and did not require a long-distance travel to reach Assam. Nowgong (Nagaon) was another district that received 14 % of the entire refugee population in Assam. In Tripura, it is the West Tripura district that experienced an unparalleled wave of refugees in 1949 and a sudden increase in the population of Agartala. In Assam, the Barak valley district of Cachar experienced a growth of over 25 % in the decade 1941–1951 that was exceptional for the state.

13.4 Post-1951 Immigration in the North-East

The immigration that took place after 1950 was qualitatively different and quantitatively more intense than the previous decades. Till the year of partition of India in 1947 which coincided with the end of the British colonial rule, interstate movement which involved Bengal was perfectly legal. After the creation of Pakistan that had its eastern wing in East Bengal, i.e. East Pakistan, interstate movement changed into an international migration bringing an end the free movement of people between East Bengal and Assam. For a few more years after 1947, refugees from both sides were permitted, an arrangement that ended by 1950–1951. Thereafter, any movement from East Pakistan was illegal, if not backed by a valid document. Yet, the illegal immigration from East Pakistan and subsequently from Bangladesh continued into neighbouring Assam, Tripura, Mizoram and West Bengal.

The 30 year period, between 1951 and 1981, represents a period of uncertainty in the history of Assam, faced as it was with the secession movement of its constituent units. Added to this was the continuing illegal migration from East Pakistan and subsequently Bangladesh, till the mid-1980s. Immigration in Assam from Bangladesh has virtually stopped or reduced to a trickle after Assam anti-foreigner movement that lasted for 6 years from 1979 to 1985, but the continued illegal immigration from Bangladesh into Assam for over three decades has disingenuously impacted the socio-economic landscape of Western Assam and generated a simmering discontent and tension in the Assamese society as witnessed in occasional eruptions of riots as a result of clash of interests between the Assamese peasants and the immigrants.

13.4.1 The Declining Trend of Immigration

The year 1971 is a watershed in the history of immigration in Assam. There has been a progressive increase in the number of immigrants born abroad, standing at an all time high of 987,028, out of which 903,429 or 91.5 % came from Bangladesh. The gradual increase and decline in the number of the immigrants in Assam has been as follows (Table 13.10):

The two maxima in the immigration curve are those relating to 1951 and 1971, the former following partition of India and the creation of Pakistan and the latter following the birth of Bangladesh. In the case of 1951, it was partly the disturbed conditions in East Pakistan and partly the apprehension of minority community, i.e. the Hindus, who migrated in large number to Tripura and Assam, though it must be added that the migration in Assam was not only of displaced persons, i.e. Hindu refugees, but the immigration stream contained a significant inflow of even non-Hindu population, the flow that continued surreptitiously and illegally even after 1951. In 1971, it was the persecution by the Pakistan army that pushed a mass of people to leave their home and hearth and take shelter in the bordering areas of Indian states.

Table 13.10 Trend of immigration in Assam

Year	Persons born outside India but enumerated in Assam	In percent of population	Year	Persons born outside India but enumerated in Assam	In percent of population
1881	5,407	0.11	1951	896,385	9.91
1891	NA	NA	1961	863,653	7.26
1901	27,356	0.46	1971	987,028	6.6
1911	49,424	0.70	1981	–	–
1921	73,496	0.92	1991	254,893	1.13
1931	95,000	1.02	2001	5,053	–
1941	–	–			

Sources:
For 1881 – Census of India 1881, Govt. Printing Press, Calcutta, 1883, p. 51
For 1901 – Census of India 1901, vol. IV-A, table XI, Birth place, p. 63
For 1921–1931 – Census of India 1931, Assam, vol. III, pt. I-A, Report, p. 43
Census of India, 1951, vol. XII, Assam, Manipur & Tripura, pt. II-A, tables, pp. 118–130
Census of India 1961, vol. III, Assam pt. II-C, Cultural and Migration tables, p. 185
Census of India 1971, Assam, Series 3, pt. II-D, Migration tables
Census of India 1991, Series I-India, pt. V-D, series Migration tables, vol. 3, pt. 2, table D-3 Assam, Bihar, Goa
Census of India 2001, Data highlights, tables D1, D2, & D3, Statement No. 7, p. 14

13.4.2 The Origin of Immigrants from Abroad

The arrival of immigrants could be traced to other states of India or the neighbouring Asian countries. Among the countries that dominated the immigration stream is East Pakistan, subsequently named Bangladesh, which contributed around 95 % of total immigrants born outside India (Table 13.11).

The immigrants originating in other states of India have remained steadfast in their source without much change. Bengal, Bihar, Orissa and U. P. have been the leading states that have always contributed to the immigration in Assam (Table 13.12).

The year 1931 was the peak of immigration when 1.314 million people of Indian origin, born outside Assam, were enumerated in Assam. Before 1947, Bengal sent the largest number of tea plantation workers, followed by Orissa, U. P. and Central Provinces. In the case of Bengal, the decline in the number of migrants to Assam was more than compensated by illegal migration of people from Pakistan and subsequently from Bangladesh. While Madras, later named Tamil Nadu, disappeared from the immigration field, Rajasthan emerged as a major contributor to the volume of immigration in Assam. Its share in the indigenous migration stream to Assam rose from 1.2 % in 1921 to 1.67 % in 1931 to over 5 % in 1971. From mid-twentieth century till the end of the twentieth century, Bihar has always been a major supplier of labour ranging from 36 % in 1931 to 46 % in 1951, remaining at the same level even in 1971 and 1991.

The dominance of people from Bihar and U. P. in the immigrant population of Assam is clearly discernible in many western districts of Assam. The coolies at the

Table 13.11 Origin of immigrants from the neighbouring countries (1951–1991)

	1951		1961		1971		1991	
Countries of origin	Immigrants in Assam	Percentage of total immigrants in Assam	Immigrants in Assam	Percentage of total immigrants in Assam	Immigrants in Assam	Percentage of total immigrants in Assam	Immigrants in Assam	Percentage of total immigrants in Assam
Total immigrants from abroad	896,389		862,339		987,027		339,558	
Pakistan/Bangladesh	833,536	92.96	774,869	89,86	903,429	91.53	303,210	89.29
Nepal	56,572	6.31	82,624	9.58	78,268	7.92	22,433	6.60
Myanmar	3,296	0.36	–	–	2,335	0.23	510	0.15
UK	–	–	820	0.1	–	–	–	–
Others	3,380	0.36	3,926	0.45			13,402	3.94

Sources:
Census of India (1951:18–124)
Census of India 1961, vol. II, Assam, pt. II-C, Cultural and Migration tables
Census of India 1971, Assam, Series 3, pt. II-D, Migration tables
Census of India 1991, Series 3 – India, pt. V-D, Series Migration, tables vol. 3, pt. 2, table D-3, Assam, Bihar, Goa

Table 13.12 Indian states and their share of contribution to the indigenous immigration in Assam, shown by number of immigrants born in each state and their percentage to the total number of immigrants

India/states where born	1921[a]	In %[b]	1931[a]	In %[b]	1951[a]	In %[b]	1961[a]	In %[b]	1971[a]	In %[b]	1991[a]	In %[b]
India	1,216,661	100	1,314,000	100	447,414	100	489,928	100	535,434	100	536,579	100
Bengal/West Bengal	373,873	30.73	575,000	43.76	23,454	5.24	55,015	11.22	65,682	12.27	94,564	17.62
Bihar					206,346	46.12	257,732	52.61	243,915	45.55	194,564	36.26
Bihar + Orissa	535,565	44.01	472,000	35.92								
Orissa	–	–	–	–	87,216	19.49	51,191	10.45	30,310	5.66	10,300	1.92
Central Provinces/M.P.	77,082	6.34	82,000	6.24	35,554	7.95	11,165	2.27	13,965	2.61	7,580	1.41
U. P.	96,982	7.97	68,000	5.18	33,463	7.48	40,785	8.32	64,323	12.01	54,557	10.17
Madras	54,527	4.48	58,000	4.41	12,719	2.84						
Tamil Nadu							7,626	1.56	–	–	2,580	0.48
Rajasthan	16,000	1.32	22,000	1.67	17,280	3.86	22,263	4.54	3,070	0.57	29,599	5.52
Tripura	–	–	–	–	15,098	3.37	11,476	2.34	3,070	0.57	37,101	6.91
Manipur	–	–	–	–	3,923	0.88	5,739	1.17	5,905	1.10	7,500	1.40
Nagaland	–	–	–	–	–	–	2,822	0.57	4,670	0.87	9,800	1.83
Meghalaya	–	–	–	–	–	–	–	–	26,503	4.95	31,747	5.92
Others	62,632	5.15	37,000	2.82	12,361	2.77	24,114	4.92	74,021	13.83	56,687	10.56

Sources:

1. Census of India 1921, vol. III, Assam, pt. II – tables, pp. 67–85 (by O. T. Lloyd)
2. Census of India 1931, vol. III, Assam, pt. I-A, Report, pp. 43–45
3. Census of India 1951, vol. XII, Assam, Manipur & Tripura, pt. II-A, tables, pp. 112–135
4. Census of India 1971, Assam, Series 3, pt. II-D, Migration tables

Notes:

[a]Number of persons born in the states of India, other than Assam State but enumerated in Assam

[b]Percentage of the total number of immigrants from Indian states

station platforms, the laundry men visiting hotels and guest houses, the autorickshaw drivers, street vendors, delivery boys, loaders at road terminals, *chowkidars*, vegetable vendors and a large number doing odd jobs at sites like brick kilns can be spotted out anywhere. The legal as well as illegal migrants from Bangladesh are invariably agriculturists. They have introduced an odd element in the rural landscape of Western Assam. In Nagaon, Darrang, Udalguri, Barpeta and Goalpara, they have promoted and developed their own settlements occupying large tracts of land that were lying waste and subsequently reclaimed and cultivated by farmers arriving from Mymensingh, Sylhet, Rangpur or any other district of Bangladesh. Among the immigrants, there has always been a dominance of those coming from Bengal, later Pakistan and subsequently Bangladesh. The new immigrants occupy initially neglected, unhealthy and un-reclaimed '*char lands*', where they grow single crops and vegetable during the dry seasons, market the vegetables in the adjacent villages, maintain contact with the neighbouring villages by boat and gradually move out one by one looking for a 'perch', a nucleus to be followed by a phase of accretion and emergence of a newer village of Bangladeshi immigrants.

13.4.3 Spatial Distribution of Immigrants

Leaving aside the extreme eastern part of Assam, most other parts of the state are affected by immigration. The districts most affected are Goalpara, Kamrup, Nagaon, Udalguri, Darrang, Barpeta and Lakhimpur and Sibsagar in Brahmaputra valley and the three districts of Cachar, Hailakandi and Karimganj in the Barak valley. Many of these districts like Lakhimpur, Darrang, Sibsagar, Jorhat and Tinsukia are tea-producing districts, and an abundance of plantation workers known as the tea garden coolies is a common feature. The non-tea-producing districts like Goalpara and Nagaon have attracted largely peasant immigrants from Bangladesh. The distribution of the immigrants in Assam, as enumerated in 1971, is given in Table 13.13.

A dominance of immigrants from Pakistan/Bangladesh is a significant feature of immigration in Assam especially after the partition of India and remained so till the 1980s. In recent years, the immigration of peasants from Bangladesh has greatly declined if not completely stopped.

The distribution of immigrants of different origin has followed a set pattern and variation, if any, is only moderate. For immigrants from Pakistan/Bangladesh, the preferred districts are Goalpara, Nagaon, Kamrup, Cachar, Darrang and Lakhimpur, in that order (Table 13.13). The first four districts accounted for three-fourths of the entire population of Pakistani[3] immigrants in 1971. Goalpara, Nagaon, Kamrup and Cachar, each of these districts has about 20 % of the total number of Pakistani immigrants.

[3] Census of India 1971 makes reference to Pakistan and not Bangladesh, and though Bangladesh may have been born before March 1971, the normal census month, the birth of immigrants is rightly recorded in Pakistan.

Table 13.13 Total number of Pakistani immigrants in 1951 and 1971

State/districts	1951		1971	
	No. of Pakistani immigrants	Percentage of total Pakistani migrants	No. of Pakistani immigrants	Percentage of total Pakistani migrants
Assam	833,388	100	903,427	100
Goalpara	135,268	16.23	178,761	19.79
Nagaon	172,704	20.72	176,294	19.51
Kamrup	186,774	22.41	167,000	18.49
Cachar	129,573	15.55	145,361	16.09
Darrang	84,277	10.11	96,963	10.73
Lakhimpur	60,976	7.32	88,388	9.78
Sibsagar	26,481	3.18	29,882	3.31
Others	37,335	4.48	20,778	2.30
Total	833,388	100	903,427	100

Sources:
Census of India (1951)
Census of India 1971, Assam, Series 3, pt. II-D, Migration tables

Part of Assam east of Nagaon, south of Brahmaputra, is relatively free from immigrants, both of Pakistani and indigenous origin.

The three districts of Goalpara, Nagaon and Kamrup are the most preferred districts of immigrants from Pakistan/Bangladesh, and they have ever been so. Goalpara is most easily accessible from Mymensingh, Sylhet and Dhaka. It is about 150 km north of Mymensingh and is easily reached through Mankachar gap between Brahmaputra and Garo Hills. Besides, Goalpara was a part of Bengal before the British merged it with Assam and has a sizable Muslim population that welcomed and provided shelter to the co-religionist immigrants. Similar was the case with Sylhet, the district transferred to Pakistan after partition. It was the district to the immediate east of Mymensingh, adjacent to Cachar, and was a favourite destination of Pakistani immigrants after 1947. Nagaon, on the other hand, had the attraction of extensive marshy wasteland, exercising a great attraction on the peasants from East Pakistan/Bangladesh who migrated there in hordes, reclaimed the wasteland and developed their independent settlements.

The tea estates of Lakhimpur district recruited a huge labour force from Bihar, Orissa and U. P. The people from Orissa are concentrated in the three districts of Lakhimpur, Darrang and Sibsagar, with marginal presence in Nagaon and Cachar. These are also the preferred districts where a large number of tea plantation workers arrived from Bihar, with their larger concentration in Lakhimpur followed by Darrang, Sibsagar and Nagaon. The immigrants from U. P. followed the footprints of their Bihari neighbours though their presence in most parts was less than one-fifth of their Bihari brethren. The number of immigrants from West Bengal was not very significant, much of it confined to Goalpara district.

In most of the six districts of Assam, viz. Kamrup, Lakhimpur, Goalpara, Nagaon, Cachar and Sibsagar, they had 10–14 % of immigrant population in 1971.

Table 13.14 Immigration in Assam as estimated on the basis of 'place of birth' and 'last place of residence'

Number of persons with their place of birth outside Assam in 1991				No. of persons with the place of their last residence (all duration of stay at the place of enumeration) 1991	
1.	Persons born in an Indian state	536,579	61.24 %	487,761	65.70 %
2.	Persons born outside India	339,555	38.76 %	254,893	34.30 %
3.	Total	876,134	100 %	742,254	100 %

Source: Census of India 1991, Migration tables, vol. I, tables D-1 & D-2

13.5 Migration During the Last Two Decades

This refers to the period from 1991 onward. It needs mentioning that Census of India did not conduct any census in Assam in 1981 and all figures relating to the population of Assam for 1981, including migration, are estimates. Migration figures for 1991 are published, but for 2001, these are not yet available. An additional feature of migration records in 1991 is the introduction of 'the place of last residence and the duration of stay at the place of enumeration' besides the place of birth that was always a primary feature of migration tables that gave an idea about the place of origin and the strength of immigrants in an area. There is, as expected, some discrepancy between the number of people recorded with their place of last residence and the one obtained by recording the place of birth. In both situations, the status of an individual can be determined. The place of birth and the last place of residence both reflect the status of the immigrants. As explained earlier, the level of immigration determined on the basis of 'the last residence' is lower than the one based on place of birth. What is not quite understandable is both sets of data are used for determining migration. Table 13.14 clearly brings out this discrepancy.

Clearly, there is a divergence between the two figures obtained by using two different criteria. There is definitely an under-enumeration of immigration if the calculation is based on the last place of residence. Obviously, there will be many immigrants who may have arrived at their place of enumeration in stages, a kind of multistage immigration. Imagine, a person arriving from U. P. or Bangladesh lands first in Goalpara and after a stay of 1 year moves to Darrang where he is enumerated, but he and she does not disclose his or her status as an immigrant as he has migrated from a place in Assam.

As seen in the table, the estimate of immigrants based on place of birth is 18 % higher than the one based on the last place of residence.

13.5.1 Decline in the Number of Immigrants in Assam

There is a significant and decisive decline in the number of immigrants arriving from both sources, domestic as well as international. A rising trend of immigration

Table 13.15 Change in the number of immigrants in Assam from Indian states and other countries between 1971 and 1991

Immigration in Assam	1971	1991	Change (%)
1. From Indian states	535,434	487,761	−9.0
2. From other countries,	987,292	254,893	−74.18
From Pakistan (1971) and Bangladesh (1991)	(903,429)	(213,077)	−76.5
3. Total	1,522,726	742,654	−51.2

Sources:
1. Census of India 1971, Series 3, Assam, pt. II-D, Migration tables
2. Census of India 1991, Series 4, Assam, pt. VA &VB-D Series, Migration tables
Note: The data for 1991 is based on last place of residence, Bangladesh in this case

in Assam witnessed till 1971 shows a steep decline. This decline, more than half of what it was in 1971, is not the result of decline in domestic immigration, which has remained virtually constant, but reflects a sudden drop in immigration from Bangladesh. One may compare the two sets of data (Table 13.15):

The migration data for 1991 is based on the last place of residence and duration of stay at the place of enumeration and not on place of birth as in the case of 1971. Theoretically, it should make no difference since whatever the duration of stay, all durations, ranging from less than 1 year to over 20 years, cover the entire population of immigrants.

The decline in the number of immigrants from Bangladesh over a period of two decades is so significant that one would be justified in imagining that the immigration from Bangladesh has virtually stopped. In 1971, the number of immigrants in Assam born in Pakistan/Bangladesh was 903,429, and within a period of two decades, their number appears to have declined by over seven hundred thousand people. Part of this decline may be attributed to natural causes like death, but it is also likely that some of the immigrants migrated from Assam to other states of India. If immigration had continued unabated after 1980s, as is often made out to be the case, such a drastic decline in the number of immigrants could not have occurred. According to the Census of India 2001, the total number of people who migrated from Bangladesh to India between 1992 and 2001 was 279,876. There is a shift in the movement of people from Bangladesh, and Assam is no more the preferred state.

The present author thinks that the Assam Movement against immigrants that lasted from 1979 to 1985 had a severe restraining impact on the immigration from Bangladesh, and one is inclined to speculate that the illegal immigration from Bangladesh is virtually stopped, the alarm raised by the Assamese social leaders notwithstanding. The thinning or complete stoppage of immigration to Assam, legal or illegal, is further supported by the census records of migration seen in 2001 (Table 13.16). Census of India 2001 records 5.1 million immigrants in India from the neighbouring countries, seen through 'the last residence' criterion. About 97 % of these immigrants were from the eight neighbouring countries (Afghanistan, Bangladesh, Bhutan, China, Myanmar, Nepal, Pakistan and Sri Lanka). Of these about 69 % (3.084 million) were from Bangladesh, 10 % (0.5 million) from Nepal

Table 13.16 Number of immigrants in India in 1991 and 2001, based on last residence and 0–9 years stay in India

Neighbouring countries	2001			1991			Decadal variation 1991–2001 (%)
	Male	Female	Persons	Male	Female	Persons	
Afghanistan	2,352	2,428	4,780	2,500	2,389	4,889	−2.2
Bangladesh	132,125	147,753	279,878	291,983	299,589	591,572	−52.7
Bhutan	2,444	1,579	4,023	2,418	2,184	4,602	−12.6
China	6,702	1,983	8,685	1,965	990	2,955	+193.9
Myanmar	5,601	5,428	11,028	5,080	5,184	10,264	+0.5
Nepal	146,336	116,115	261,451	89,633	85,562	175,195	+49.2
Pakistan	20,398	16,568	36,966	38,115	31,575	69,690	−47.0
Sri Lanka	9,163	10,737	19,900	44,561	44,650	89,211	−77.7
Total	324,121	302,591	626,712	476,255	472,123	948,378	−33.9

Source: Census of India (2001, Data Highlights Migration tables, p. 2)

and around 20 % (0.9 million) from Pakistan. About two-thirds of these immigrants from neighbouring countries arrived in India before two decades, i.e. before 1981.

There is a declining trend in the number of immigrants from Bangladesh, Bhutan, Pakistan and Sri Lanka, whereas there is a sudden rise in the number of immigrants from China. The latter, however, is represented by immigrant Chinese in India working on Chinese-sponsored projects and trade missions. The increase in Nepalese immigrants is not unnatural and conforms to the ever increasing immigration from that country, partly to seek employment, but lately also to escape the disturbed political conditions. There is a substantial drop of over 50 % in the number of Bangladeshi immigrants in India living in the country for a period of 9 years or less. Reflecting the trend of decline, in the immigrant population from Bangladesh in India, is also the declining trend of immigration in Assam and other North-Eastern states, between 1991 and 2001 (Table 13.17).

13.5.1.1 Decline in Immigration in Assam and North-Eastern States from Bangladesh and Other Countries

It appears that based on the residence length of zero to 9 years in the state, there were only 5,053 immigrants in Assam who arrived between 1991 and 2001. Secondly, this is the total number of immigrants; those who arrived from Bangladesh must be still a smaller number. This forms the basis for the observation that immigration from Bangladesh has virtually stopped. Conforming to the All India trend, one may even surmise that about 40 % of the immigrant population of 5,053 came from Bangladesh, between 1991 and 2001, bringing down their number to roughly 3,000. For the alarmists, it will look preposterous, but one has to look at the hard facts, seen through enumerated figures. One would not dispute the fact that there

Table 13.17 Number of immigrants from other states and other countries during 1991–2001 over a period of 10 years based on last residence (0–9 years)

Receiving states	Population 1991	Immigrants from other states 2001	Immigrants from other countries	Out-migrants	Net immigrants	Immigration rate (1991–2001) per 100 persons (in 1991)
India	846,387,888	16,826,879	740,867	16,826,879	740,867	+0.09
Arunachal	864,558	71,789	2,931	12,507	62,213	+7.2
Assam	22,414,322	121,803	5,053	281,510	−154,654	−0.7
Manipur	1,837,149	4,529	182	30,867	−26,156	−1.4
Meghalaya	1,774,778	33,710	1,154	20,434	14,430	+0.8
Mizoram	689,756	22,599	8,436	31,739	−704	−0.1
Nagaland	1,209,546	33,594	1,752	51,867	−16,511	−1.4
Sikkim	406,457	22,519	7,655	6,238	23,936	+5.9
Tripura	2,757,205	40,262	11,246	23,538	27,970	+1.0

Source: Census data 2001 on interstate migration based on last residence (0–9 years) migration rate, Census of India (2001, data highlights, migration tables, p. 14)

Table 13.18 Different durations during which immigration from Bangladesh took place

Duration during which immigration took place	Immigrants from Bangladesh in Assam
1972–1981	16,200
1982–1986	5,568
1986–1990	4,810
1990–1991	1,419

Source: Census of India (1991, Series 1-India, pt. IV-D series, vol. 2, pt. I, table D-2, p. 187)

could be a large number of illegal immigrants; but does the census discriminate between legal and illegal immigrants? It has to be emphasised that bulk of international migration, of which Bangladesh accounts for over three million in 2001, took place over 20 years ago, and annually there has been a slowing down of immigration. In the light of the above trend, a record of 5,053 immigrants in Assam from foreign countries between 1991 and 2000, a period of 9 years, should not come as a surprise. For India as a whole, the total number of immigrants from Bangladesh recorded in 2001 was 3,084,826, out of which only 279,896 or 9 % appear to have arrived in India during a period of 9 years, ending 2001, and 2,096,946 or 68 % of the total immigrants of Bangladesh had already migrated to India before 1981.

In case of Assam, the number of immigrants based on last residence, as seen in 1991, is as in Table 13.18.

The picture may appear incredibly low, but there is no reason to doubt the authenticity of these figures and disregard the census findings altogether. There is a clear suggestion from Table 13.18 that the immigration from Bangladesh has declined after 1981.

13.5.1.2 An Exercise in the Quantitative Assessment of Immigration from Bangladesh

One of the ticklish questions in the contest is the definition of *immigrants*. No doubt, an immigrant is one who has migrated to the country of his/her present residence from a country of his/her citizenship. Does the term also include those who are born to the immigrant parents, or is it limited to only those who actually migrated from another country? In the case of Assam, does the term imply to only those individuals who migrated to Assam from another country regardless of their age, sex or religion? It is not rare to find a view that advocates the inclusion of not only those who have literally migrated from another country but also their descendents who were born in the country of their destination.

Barpujari (1998:33–56), while discussing migration in Assam under the title *Migration*: *Crisis and Identity*, estimated the strength of plantation labour as three million, able to influence the election of 16 members of the State Legislative. It is known that the labour employed in Assam has a strength of over 600,000, ranging between six to seven lakhs, a number that includes field as well as factory labour, both resident and on contract. One may point out that the plantation workers have an equally large number of dependents, bringing the total to just over 1.25 million. Thus, Barpujari's estimate of three million appears an overestimate. To be fair to the historian, for earlier period like 1891, 1901, 1921 and 1931, he has depended on census figures of different decades and quoted very accurate figures. His sounding of alarm, however, rests on population explosion in Assam, showing a 6.75 times growth between 1901 and 1991 as opposed to the population growth of India that multiplied only 3.53 times during the same period. Large-scale immigration is the obvious explanation.

Another important question that could trouble a researcher is the selective targeting of Muslim immigrants. It is true that in the early migration stream, originating from Bengal, a majority consisted of 'peasant Muslims' who numbered about half a million in 1931 (Guha 1978:44). It must be emphasised that nowhere in census records more than 1.5 million (1,522,467 in 1971) people are reported to have their birth place outside Assam. In broad terms, this refers to the number of actual immigrants, having been born in a state of India beyond Assam or in a foreign land. The largest number of immigrants of foreign origin ever recorded before 1971 was 95,000 in 1931 consisting of mostly Nepalis, Burmese, some Afghans and Europeans. The picture changed after 1947, the year of India's independence, when for the first time 896,388 immigrants of foreign origin were recorded, of which 93 % originated from East Pakistan and over 6% came from Nepal, the two principal sources of illegal immigration (Table 13.19).

The highest number of people of foreign origin, i.e. those who were born in a foreign land, ever recorded was 987,028 in 1971 as in Table 13.19 and never exceeded one million. In contrast, the highest number of people of Indian origin, born outside the state of Assam, was 1.314 million in 1931. The latest recorded number of immigrants, based on the place of birth, is available till 1991. According to which, the entire population having its birth place outside Assam was 876,134,

Table 13.19 Immigrants in Assam of foreign origin between 1951 and 1991

Year	Number of people in Assam born in other countries			
	Total immigrants of foreign origin	Born in Pakistan/Bangladesh	Born in Nepal	Burma
1951	896,389	833,288	56,572	3,296
1961	863,653	774,869	82,624	3,063
1971	987,028	903,429	78,268	2,335
1991	339,555	303,219	22,433	

Source: Census of India (1951, 1961, 1971)

of which 61.25 % was born in one or the other of the Indian states and the remaining 339,555, i.e. 38.8 % of the total immigrant population, had their birth in a foreign land. There is a general perception among political leaders as well as the public that India is subjected to an inordinate pressure of illegal immigrants from several neighbouring countries, but specifically from Bangladesh.

13.5.2 Immigration from Bangladesh in Assam during or after 1971

The year 1971 was the most critical year from the point of view of immigration from neighbouring East Pakistan/Bangladesh in India in general and Assam in particular. This was the year in which East Pakistan was liberated from the domination of West Pakistan and became a Republic of Bangladesh. But before it was liberated, the Bangladeshi people suffered a prolonged persecution and brutality, unleashed by the defence forces of Pakistan. This resulted in the migration of hordes of Bangladeshis in the neighbouring states of India to escape the atrocities of the Pakistani army. At one stage, it is estimated, India sheltered a million refugees in the border states of West Bengal, Assam and Tripura. The persecution by the Pakistani army and the subsequent Bangladesh war of 1971 worked as a trigger for mass exodus of people from Bangladesh.

It is generally believed in India that though a majority of refugees returned after the liberation of Bangladesh, a substantial number remained in India. More importantly, the torrent of Bangladeshi immigrants of refugees never dried up, and there has been a continued illegal migration from Bangladesh in Assam and West Bengal with fluctuating intensity depending on the political situation in Bangladesh as well as in India. This brings one to the question of the volume of immigration in Assam between 1971 and 1991.

The question of magnitude of immigration assumes importance in view of the deep concern and fear of Assamese to the point of being numerically overwhelmed by the immigrant population. The continued illegal immigration of Bangladeshis in Assam has not only caused concern among the Assamese but created an atmosphere of apprehension and fear that has engulfed the Assamese society, appearing in

occasional disturbance and agitation against immigration and immigrants, resulting into violent clashes and arson. The fear of the Assamese may be genuine; a large mass of immigrants from another land and a different cultural background would not only compete for the limited economic resources and opportunities, but could also disrupt the social fabric of the state and threaten the cohesiveness of the Assamese society. It is against this background that the illegal immigration of Bangladeshis is usually evaluated.

13.5.2.1 Varying Estimates of Immigrant Population

There has been no direct census of the number of immigrants and the origin of the immigrants, especially since 1951. The data utilised to estimate the number of immigrants is the number of people born outside Assam, in other states of India and other countries. This is supplemented by another set of data of the people with their 'last place of residence' and the duration of their stay at the place of enumeration. The number of immigrants coming from East Pakistan or Bangladesh is thus the number of people born in East Pakistan or Bangladesh and enumerated in Assam. The accuracy of the number of immigrants derived from the census data can always be questioned. The situation is further compounded by a false response of the immigrants to the census enumerators, hiding their real identity.

J. C. Bhuiyan, one of the census officials from Assam, has made the following observations about the reliability of census data relating to immigration: 'Unfortunately, these data are not at all reliable. As already discussed in the 1961 Census Report of Assam, the illegal migrants are unlikely to respond faithfully for fear of deportation. It is, therefore, not possible to correctly estimate the size of illegal migrants.... Therefore, the extent of migration is to be estimated indirectly. Such estimates are always approximate' (Bhuiyan 2006:85). A similar view was expressed by Lt. General Sinha, Governor of Assam, in his letter to the President of India, written on 8 November 1998, wherein he observes that 'since no Census was carried out to determine the number of illegal migrants, precise and authentic figures are not available'.

In the absence of very reliable data, variable estimates have been made of immigrants from Bangladesh in India and in Assam. One of the early estimates has been attributed to Rai (1993:175) who estimated a population of 10.8 million illegal Bangladeshi migrants into India, of which roughly four million were in Assam, four million in West Bengal, two million in Bihar and the remaining 810,000 spread over other states of India like Delhi, Madhya Pradesh and the city of Mumbai. A report prepared by the Task Force appointed by the Government of India and headed by Madhav Godbole (2000) gave the figure of 15 million as the number of illegal immigrants in India.

Among the more tangible estimates of Bangladeshi immigrants, especially during the two decade period of 1971–1991, for which data are available, are those of Bhuiyan (2006) and Saikia (2006), the former a Deputy Director of Census Operations, Assam, the latter a Reader at Gauhati University. Both these authors

think and discuss only the infiltration of Muslims from Bangladesh in Assam, and don't even contemplate the possibility of a non-Muslim immigration from Bangladesh. Such a proposition where illegal immigrants from Bangladesh are equated with Muslims is neither fair nor plausible. This can be seen from the method adopted by both to arrive at an estimate of Bangladeshi immigrants, supposedly Muslims.

Both have estimated the number of immigrants from Bangladesh between 1971 and 1991, by estimating the population of Muslims in Assam in 1991, assuming a specific growth rate and declaring the excess of the actual population of Muslims in 1991, over the estimated population of the community, as immigrants. The method is logical but the assumed growth rate is untenable. While Bhuiyan assumes the same growth for Muslim population as is seen for the entire population, Saikia goes a step further and applies the non-Muslim growth rate to arrive at the estimate of Muslim population in Assam in 1991.

Thus

$$\text{Im} = P_2 - \left\{ P_1 \left(1 + \frac{g}{100} \right)^2 \right\}$$

where P_1 is the censused population of Muslims in 1971 and P_2 is the censused population of Muslims in Assam in 1991 and g is the decadal growth rate.

Both Bhuiyan and Saikia have applied a growth rate of non-Muslim population in Assam as seen between 1971 and 1991. While the P_1 and P_2 representing the population of Muslim in Assam 1971 and 1991, respectively, are fixed as determined by the Census of India, the growth rate, split community wise, is variable.

Calculated from the census figures of population, the growth rate for different religious groups and the projected population of Muslims in Assam on the basis of different growth rates is as follows (Table 13.20).

Bhuiyan (2006:85), applying the non-Muslim growth rate in Assam, arrived at a figure of 1.15 million as the number of Bangladeshi immigrants. Saikia (2006), on the other hand, has applied the district-wise growth rate of non-Muslim population, thus deflating the projected population and showing a large difference between projected and enumerated population of Muslims. According to him 1.45 million Muslim Bangladeshis migrated to Assam between 1971 and 1991.

Such assumptions of growth rates adopted by Bhuiyan are neither fair nor plausible. It is absurd to assume that all religious groups grow at the same rate and that the Muslims of Assam have grown, or are supposed to grow, at the same rate as the rest of the communities. A more theoretical objection would be to equate Muslim immigrants with Bangladeshi immigrants. There could be Muslim immigrants from other parts of India as well. Following the method of Bhuiyan and Saikia and applying the general growth rate of Muslims in India, one arrives at a projected population, which is only 431,831 less than the enumerated population and can be taken as the number of immigrant Muslims between 1971 and 1991.

Table 13.20 Muslim immigrants on the basis of different assumed growth rates

Community	Population in Assam		Growth rate between 1971 and 1991	Projected population of Muslims in Assam on variable assumed growth rate	Censused population of Muslims in Assam in 1991	Immigrant Muslim population in Assam between 1971 and 1991
	1971	1991				
Hindus	10,604,618	15,047,203	41.89	5,096,865	6,373,204	1,276,339
Muslims	3,592,124	6,373,204	77.42	6,373,204	6,373,204	Not determined
Non-Muslims	11,033,028	16,041,118	45.39	5,222,589	6,373,204	1,150,615
Total population all communities	14,625,152	22,414,322	53.25	5,504,930	6,373,204	868,274
Muslim population in India	61,417,934	101,596,057	65.40	5,941,373	6,373,204	431,831

Source: Data for 1971 and 1991 see Banthia (2001)

The alarm created by unceasing illegal migration of people from Bangladesh has produced some degree of communal tension. The tripling of Muslim population in Assam from less than two million in 1951 to over eight million in 2001 stands in sharp contrast to the growth of less than 100 % of the population of Hindus. Over the last three decades (1971–2001), while the population of Hindus has declined in percentage terms from 72.5 to 64.9 %, the population of Muslims has registered an increase from 24.5 in 1971 to 31 % in 2001. There is a general feeling that at the rate at which the Muslim population is multiplying, it may emerge as the largest religious community outnumbering even Hindus. This is attributed to the neglect of the Central Government and its reluctance to take stern measures to stop illegal migration.

How many Bangladeshis really immigrated into Assam over a period of two decades is largely a matter of conjecture. What seems to be certain is that the immigration, after the anti-foreigners' agitation of the 1980s, has virtually stopped. There may be an occasional family or an individual sneaking into Dhubri, Goalpara or Karimganj, the districts bordering Bangladesh, but there is no stream – may be an occasional trickle – of immigration from Bangladesh.

13.5.3 Causes of Immigration

Assam has been a land of immigrants from very early times, a virtual melting pot where different ethnic groups arrived and adopted the region as their homeland. But, here we are concerned with the more recent immigration spawning a period of a century and a half, starting in the mid-nineteenth century, after the arrival of the British rule in the region. Large-scale immigration in Assam started after the East India Company established its foothold in Assam and the growth of tea plantations that required a large horde of labour. Recruitment for tea plantation labour, after 1850, attracted immigrants from all over India, but especially Bengal and more specifically from the neighbouring districts of Bengal.

Tea plantation workers, hired on contract, were the first immigrants. They were largely confined to the plantation areas. With them came the peasants from Bengal whose primary aim was to look for un-reclaimed cultivable land. For the peasant immigrants, land availability was a major attraction, as, even in the beginning of the last century, Bengal was far more densely populated than Assam. Thus, a push away from home, because of non-availability of land and the pull of 'fresh pastures' – the un-reclaimed land in Brahmaputra valley – combined to accelerate the process of migration from Bengal to Assam. The British rulers, in an effort to help tea planters, encouraged such migration.

In addition to the influx of tea plantation workers from all over India, the British imported a large corps of Bengali officials familiar with British administration, from the neighbouring districts of Dacca, Mymensingh and Rangpur. Some of the early immigrants to Assam were the Bengalis employed in the service of the State Government. This migrant group consisted of clerks, petit bureaucracy and officers,

called *amlahs*. A large number of Bengali Hindus in Assamese population trace their origin to their immigration during the British rule, especially in the latter half of the nineteenth century.

The most striking immigration has been that of Muslim Bengali peasants arriving from East Bengal. Their immigration was encouraged during the early British rule as vast tracts of cultivable land remained untouched. This influx of migrants notwithstanding, Sir Henry Cotton, Chief Commissioner of Assam, found that at the close of the century (nineteenth century) over four-fifths of the cultivable waste was untouched by plough. What the chief commissioner wanted was to cover these with food crops not with tea bushes, for Assam had to depend on Bengal for food grains[4] (Barpujari 1998). The immigration to reclaim and cultivate vast chunk of idle land continued and developed into a flood by the end of the first quarter of the twentieth century. The immigration of Bengali peasants was not only unrestricted but even encouraged.

The British devised a mechanism called 'line system'[5] to regulate the immigrant settlers, compelling them to settle in segregated colonies and occupy land only in certain earmarked areas. There were attempts to restrict the flow of migrants by a Congress coalition Government in Assam, disallowing settlements to persons who arrived in Assam after 1 January 1938, but this Government was soon replaced by a Muslim League Government, headed by Sir M. Sadullah, during whose rule a concerted effort was made to encourage the migration of Bengali Muslims into Assam for political reasons. The Viceroy, Lord Wavell, wrote in the Viceroy's journal: 'The chief political problem is the desire of the Muslim Ministers to increase this immigration into the uncultivated Government lands under the slogan of Grow more Food but what they are really after, is Grow more Muslims'.[6]

13.5.3.1 Causes of Continued Migration After 1947: The Year of India's Independence and Partition

Besides the British rule that encouraged immigration for the reasons mentioned above, immigration and largely illegal migration have continued from East Pakistan, now Bangladesh, into Assam unabated. The principal reasons are summarised below:

[4] PWD (R. C.) Proceedings, 1902, Oct., No. 105, Perum to Secretary Government of India, 18th September, quoted from Barpujari (1998) North-East India. Guwahati, Spectrum, p. 35.

[5] Under *line system* lands were divided into three categories: (1) Open to immigrants, (2) Closed to immigrants (3) and where a line was drawn they could settle only on one side of it. The system was partially successful in restricting indiscriminate occupation, but 'mixed' and 'closed settlements' were turned before long into open settlements, mainly because of the insincerity and corrupt practices of the settlement officers, H. K. Barpujari, ibid, p. 37 (footnote).

[6] Quoted from the 'Report on Illegal Migration into Assam' submitted to the President of India by the Governor of Assam, Lt. General (Rtd.) S. K. Sinha, dated 8th Nov. 1998, p. 4.

Table 13.21 Population density gradient between Bangladesh and Assam expressed as ratio of population density (1901–2001)

Year	Bangladesh[1]		Assam[2]		Ratio of population density Bangladesh/ Assam
	Population	Density of people per km^2	Population	Density of people per km^2	
1901	28,928,000	203	3,289,680	42	4.38
1911	31,555,000	221	3,848,617	49	4.5
1921	33,255,000	225	4,636,980	59	3.8
1931	35,602,000	241	5,560,371	71	3.4
1941	41,997,000	284	6,694,790	85	3.3
1951	41,932,000	284	8,028,856	102	2.78
1961	50,840,000	345	10,837,329	138	2.5
1974	71,479,000	484	14,625,152[3]	187	2.58
1981[4]	87,120,000	590	18,041,248	235	2.51
1991	106,313,000	720	22,414,322	286	2.5
2001	129,247,000	875	26,655,528	340	2.57
2011	142,319,000	965	31,169,272	397	2.43

Sources:
1. Census for Bangladesh, Provisional figure 2011
2. Census of India 2001, General Population Tables, States and Union Territories, tables A-1 to A-4 pt. I, the population of Assam for 2011 is based on Census of India 2011, Provisional Population Tables Assam pt. I of 2011, Series 19, p. 4
3. Population for 1971, for Bangladesh it is for 1974
4. Estimated, as there was no census in Assam in 1981
Note the population figures and areas are adjusted to present territory of these units

1. Population density gradient, i.e. the difference in the man-land ratio between Bangladesh and Assam as well as other parts of North-Eastern region
2. Temptation of securing unclaimed and un-reclaimed government land in Assam and converting it into agricultural land that will ensure safe and secure livelihood
3. Historical events like the partition of the country and liberation of Bangladesh that triggered large-scale displacement of Hindu refugees who took shelter in the adjacent states of West Bengal, Tripura and Assam
4. Escape from the persecution by Pakistani security forces before the liberation of East Pakistan and formation of Bangladesh
5. Environmental causes like catastrophic cyclones, floods and droughts

Population Density Gradient

A very steep population density gradient between Bengal/East Pakistan/Bangladesh on the one side and Assam, especially the Brahmaputra valley, on the other provided the necessary impetus for the people of East Bengal/Bangladesh to migrate to Assam, considered, for long, a land of promise (Table 13.21). It is not that there was no migration in Assam from the rest of India; in fact, as seen earlier, there has been

an incessant stream of migration during the British rule from all parts of India. The partition of India, in 1947, triggered a renewed migration, firstly of refugee Hindus and later of Muslims from Bangladesh to Assam. Any significant event that had a destabilising impact on the population of Bangladesh got translated into a dislocation of population and its migration to Assam, the state next door with some space to accommodate additional population. What is important to realise is that after the initial wave of the migration of Hindus as refugees in neighbouring Assam, the migration stream continued and gradually changed its complexion, from being one composed largely of Hindus to the one of a mixed religious composition, to exclusive Muslim migration.

As can be seen, there is an enormous gap between the density of population of Bangladesh and Assam. In the beginning of the last century, density of population of the area of Bengal, now coinciding with Bangladesh, was almost five times higher than that of Assam. The gap is narrowed 100 years later, and in 2001, it is only 2.5 times higher yet large enough to propel the people toward lower-density areas. More significant is the density contrast between Assam and the neighbouring districts of Bangladesh. Some of the largest contributors to the migration stream to Assam are the districts of Mymensingh and Jamalpur, lying east of Brahmaputra and hardly 50 km south of Meghalaya border. These have population densities of 1,156 and 1,115 persons to a square kilometre respectively. These do not have to move even 100 km to reach Goalpara district of Assam completely bypassing the mighty Brahmaputra. Similarly, the peasants of Rangpur (population density 1,210/km^2) and Nilphamari (population density 1,152 persons/km^2) do not have to trudge even 50 km to reach the border of Dhubri district in Assam. Accessibility and easy reach have tempted peasants from highly crowded areas of Bangladesh to migrate to Brahmaputra valley. These migrants were quite accustomed to the harsh, rainy and waterlogged conditions of Bangladesh, and once in Assam they occupied the worst of land, reclaimed it and transformed it into fertile paddy fields. Equally crowded districts of Tangail, Brahmanbaria and Comilla, with a population density of 1,045, 1,157 and 1,719 persons/km^2, respectively, bordering Tripura, sent migrants to Tripura selectively. The migration stream to Tripura was so highly dominated by Bengali Hindu refugees that Muslim peasants were squeezed out. The latter faced resistance from immigrant Hindu refugees.

Besides the population density differential, as a factor in inducing migration, what was equally or even more significant was the availability of empty spaces, devoid of any fertility, yet enough of an incentive to the migrant Bangladeshis, to establish their foothold, diligently reclaim the *char* and marshy land and develop their exclusive settlements with all the cultural trappings of their religious identity.

Environmental Factors

Among other reasons, environmental factors often provide a triggering effect for the displacement and forced migration of the poor peasants to other regions, not limited to domestic destinations. Increasing pressure upon land and water resources in rural areas, caused by rapid population growth, and environmental degradation coupled

with unequal resource distribution has produced widespread landlessness and unemployment. The affected people, unable to satisfy their needs in an economically less developed Bangladesh, are increasingly moving to India where prospects of life appear better (Sarfaraz 2003). Besides, Bangladesh suffers from frequent natural disasters like flood and droughts and destructive tropical cyclones that cause enormous damage. It is estimated that even in normal flood year, 20 % of Bangladesh is inundated. These catastrophic situations force poor and often landless tenant peasants to migrate to other areas, adjacent to Bangladesh, notably Assam and the border districts of West Bengal.

Illegal Immigration and Lukewarm Response of Indian Government:
A Policy of Indifference

The continued illegal immigration from Bangladesh is among other factors attributed to an inadequate response by the Government of India to this malaise, either by preventing the immigration firmly or by detecting and deportation of illegal immigrants. Detection of illegal immigrants was, no doubt, difficult, as the earlier migrants provided shelter to the new arrivals and the latter lived undetected among their relatives and other co-religionists. The state was already burdened with over a million (1,068,455) (Barpujari ibid:39) Hindu refugees in 1968 and the more were arriving. The situation of unrest in Assam, as it existed in the 1980s, caused by unchecked immigration of Bangladeshis, could have been avoided if the Government of India had taken a determined stand against illegal migration and put in place strict security measures to stop such immigration.

13.5.4 Consequences of Migration

This dislike for Bengali and Bengali-speaking people was accentuated immediately after the partition of the country and the influx of a large number of Hindu refugees and an almost equal number of Muslims from Bengal.

It is generally believed that in the early stages of migration, the immigrant Muslims identified themselves linguistically and culturally and returned to their mother tongue as Assamese, although they used to speak their own language at home. The Assamese naturally welcomed the immigrants, commonly known as *na Assamuya*, who posed no problem to their language and culture. Moreover, they boosted up the economy of the province. 'They cleared the forests and reclaimed vast marshy tracts, mostly fallow and unexplored lands, converting these into prosperous villages. The Assamese saw before their eyes that cash crops like jute could be raised successfully and the same field would yield more than one crop' (Barpujari 1998:46). The hard work and increased agricultural productivity in lands owned by immigrant Muslims are described in some details by Kusum Nair (1961). Talking of the achievements of the immigrant Muslims originating from Mymensingh district of Bangladesh (then East Pakistan), she draws a comparison between the agricultural

practices of the native Muslims, the immigrant Muslims and the Hindus, based in Kathiatoli block of Nagaon district, in three villages, viz. Rangaloo, hamlet Sengmora and Pachim Kawaimari Kotohapara. According to her, 'the Mymensingh Muslims cultivate vegetables on a commercial scale, exclusively or in addition to paddy. Their immediate neighbours, the Assamese Muslims and Hindus, grow mainly paddy with only a few vegetables exclusively for domestic consumption. Mymensingh Muslims were, it appears, the first to introduce vegetables (and jute) cultivation in Assam, but what is surprising is that they continue to hold a virtual monopoly of it' (Nair 1961:139–140). The most crucial and decisive factor according to her and expressed by one of the local peasant is hard work. Famood Ali who was interrogated by Nair said the following: 'It depends upon habit (to cultivate vegetables). Mymensingh people have it, we do not. Secondly, it requires more labour. Thirdly, the Mymensingh farmer will grow vegetables and take them to the market in a basket on his head or on a 'Bhar'. That we cannot do. It is below our dignity. If we do not take it ourselves, we will have to hire a servant to do so; that would be expensive and the servant may cheat.'

For a couple of decades, there was not much resistance to the immigration of Muslims from East Pakistan into Assam, as immigrants expanded cultivated land, improved agricultural yield, introduced a multi-cropping system and generated an overall agricultural prosperity, without in any way affecting the economy and culture of the Assamese people. The initial appreciation turned into disenchantment as the number of immigrants multiplied, and they started exercising political influence as a vote bank. 'The honeymoon between the Assamese and the immigrant Muslims came to an end with the emergence of the Hill states, shrinking state's area from 223,550 to 78,523 km^2. Abundance of natural resources, notwithstanding, Assam continued to be poor and industrially backward … to aggravate the situation the attitude of the immigrants underwent a radical change with their growing influence as vote bank.'[7]

The positive consequence of the immigration in Assam from Bangladesh was, to start with, expansion of agricultural land and productivity, introduction of new crops, particularly jute and vegetables, greater availability of man power. The immigrants also brought with them better methods of farming, fishing and navigation. This accelerated the process of development.

13.5.5 Negative Consequences of Illegal Migration

As the number of immigrants multiplied, the people of Assam felt threatened. They lost a large part of their land to the immigrants, which held potential for future development, as the population of the state multiplied by a natural increase. The

[7] Barpujari (1998: op. cit., pp. 46–47). The three chapters, viz. Ch. 3, Migration: Crisis of Identity; Ch. 4, Anti-Foreigner Movement; and Ch. 5 Assam Accord and its Aftermath from his book *North-India: Problems, Policies, Prospects*, are a realistic account of immigration from Bangladesh and its impact and capture the perception of the Assamese people.

immigrants of all shades belonging to different regions and linguistic groups, adhering to their way of life and culture, competed in the job market and benefitted from the economy of the state, without getting integrated in Assamese society. This disturbed the social harmony and, over the years, led to the building up of a tension that exploded into 'anti-foreigners' movement. The entire North-East, but especially Assam, witnessed disturbed conditions in the wake of the 'anti-foreigners' movement that effectively lasted from 1979 to 1985. The movement, spearheaded by All Assam Students' Union (AASU), had detection and deportation of illegal immigrants as its main objective. Because of the unwillingness of the Central Government to concede fully the demands of agitators, principally the AASU, the movement was intensified and Assam Disturbed Area Act was brought into force in 1983, to cope up with the movement that witnessed arson, looting and killing, in which all the communities suffered and the state economy plummeted to a level of bankruptcy. The election that followed in 1983, despite boycott by most political parties with the exception of the Indian National Congress and the Communist Party of India, returned the Congress party to power. The prolonged agitation had, however, taken its toll and a lot of innocent people lost their lives. The most gruesome of the killings was the Nellie massacre of February 1983 in which around 2,000 immigrant Muslims, including women and children, were killed.

After the dust of the movement settled down, the Assam leaders, represented by All Assam Students' Union and All Assam Gana Sangram Parishad, reached an accord with the Government of India in August 1985, known as 1985 Accord or even Rajiv Gandhi Accord of 1985, which provided for the deportation of the illegal immigrants who arrived in Assam after 1971 and certain measures of socio-economic importance, like setting up of an Indian Institute of Technology, a Central University and an additional petroleum refinery. The implementation of this accord was taken quite seriously by the Central Government, like an IIT at Guwahati, a Central University at Tezpur and a refinery at Numaligarh were established, but the most important clause of agreement, i.e. detection and deportation of illegal immigrant, remained a sticking point. The Illegal Migrants (Determination by Tribunal) Act 1983, also known as IM (DT) Act, proved unequal to the task, as unlike the Foreigners' Act 1946, where the onus of proving innocence lay on the suspect, the IM (DT) required the complainant to prove that a specific person was an illegal immigrant. A very tedious procedure, which required primary investigation by the police, without the right to detain a suspected illegal migrant, and reporting it to a Three Judge Tribunal, made the Act a non-starter. It was generally believed in Assam that the Act helped illegal migrants more than the detecting and deporting authorities, and there was a sneaking suspicion in the mind of the Assamese people that the Central (read Congress) Government was more interested in consolidating its 'vote bank' by converting illegal Bangladeshi immigrants into permanent settlers.

The discontent with the Central rule and the Congress party resulted into the emergence of a plethora of groups struggling against illegal immigration and fighting for the legitimate rights of the Assamese people, and the return of a non-Congress Government. Their failure gave birth to a number of insurgent groups, led

by Unified Liberation Front Assam (ULFA). Assam has been in turmoil during the last three decades. Violence still erupts suddenly. Anti-foreigners' feeling is as strong as ever, and a peaceful and harmonious atmosphere is not quite in sight. This has affected not only the economy of the state, but created a society perpetually on the edge, riddled with tension and disharmony. Much of uncertainty and tension in the socio-economic structure of Assam, in the ultimate analysis, is born out of the disturbed situation created by illegal immigration from Bangladesh.

In one word, the greatest impact of continued illegal immigration in Assam from Bangladesh is the loss of harmony in the Assamese society. Gripped by a fear of losing its sociocultural identity, the indigenous Assamese looks at Assam as his beautiful homeland, seized by unfriendly ghosts and spirits. Go anywhere in Assam, the fear and dislike for a non-Assamese, not confined only to illegal migrants, is palpable. Even Indians from other states, including casual travellers, are looked upon with suspicion as if they are there to join the rank of those exploiting the wealth of the state. A dislike as well as fear of the non-Assamese is the greatest and deepest impact that the illegal Bangladeshi immigration in Assam has made in the state.

Other consequences include political, social and economic spheres, in which the immigrant Bangladeshis have begun to exert their influence and compete for space. This is not so with immigrants from Nepal or the early late settlers coming from other states of India. The latter have no political interests and confine themselves to their professions. In the political arena, a number of new parties with regional interests have sprung up in recent decades. With growing number, a number of militant outfits have also emerged with discordant slogans, often indulging in antinational activities. Fronts like Muslim Liberation Front of Assam, Assam Minority Liberation Army and Muslim United Liberation Tigers of Assam are either fundamentalist organisations or seeking share in the political leadership of the state.

It is not a coincidence that members of the State Legislature coming from Muslim-majority districts come together to form a bloc to strengthen their position in the legislature or in the government. A clear disruption of social life in Assam can be seen in the newly set up separate immigrants villages. These may be partly attributed to old 'line system', but in most cases, it is the living together in groups, like an island, that gives these villages a separate identity. The question of identity of the Assamese Muslims and the tribals is discussed by Misra (2006) who cites cases where the native Assamese Muslims are feeling gradually isolated following the onslaught of immigrant Muslims who congregate in newly constructed 'masjids' in contrast to 'namazghar' that stands not only as a symbol of a religious place of worship but is also looked upon as a social institution. The question posed by Misra and perhaps justifiably is 'Would the masjid be able to play the same role as the namazghar?' The indigenous Muslim community, which was considered to be an inalienable part of Assamese society, is under some sort of threat (Misra 2006).

The expectation and even the demand for assimilation of an immigrant population by a host community are natural and just. It often happens that the immigrants do get integrated in the regional community in the space of a few generations, without any specific social coercion. What really creates disharmony is the intransient

posture of the immigrants, appearing like predators ready to grab any economic opportunity even at the expense of the interests of the local community. This results not only in resentment but even violence. The infamous Nellie massacre of about 2,000 Muslim immigrants had its root in the predatory practice of acquiring land belonging to other communities fraudulently. In this case, the Muslim immigrants had dispossessed the local Tiwa tribals of their land 'illegally by getting a chappa (or thumb impression) on pieces of paper' (Hazarika 2006).

With the lapse of time, as the immigrants get educated, they would look for jobs and occupation outside the field of agriculture and would require not only the knowledge of language, culture and history of Assam but have to be part of it. They would gradually change their loyalty, adapt to the social conditions of Assam and will shed their non-Assamese identity.

The impact of immigration has been negative so far. It has disturbed the state, given rise to one of the unprecedented 'anti-immigration' movements that brought Assam's economy to a standstill and created hatred between communities. But more alarming is the fact that the Assamese people felt alienated from the rest of India, blamed the Central Government for favouring the immigrant community for electoral gains. Losing the trust of Assamese people, who think that the country has betrayed them, is the greatest loss to the nation that will take years to restore.

References

Banthia JK (ed) (2001) Census of India 2001. First report on religion. Government of India

Barpujari HK (1998) North-East India: problems, policies and prospects. Spectrum Publications, Guwahati, 185 p

Bhuiyan JC (2006) Illegal migration from Bangladesh and the demographic change in the North-East Region. In: Kumar BB (ed) Illegal migration from Bangladesh. Concept, Delhi, p 85

Census of India (1901) Assam, Reports, vol IV-A, chapter 3, pp 33–34

Census of India (1911) Assam report, pt. IV-A, p 35 (footnote)

Census of India (1931a) Report, vol III, pt. 1-A, p 48

Census of India (1931b) Birthplace and migration, vol III, pt. 1-A, chapter 3, p 44

Census of India (1951) Assam, Manipur and Tripura, vol XII, pt. II-A, tables, pp 112–135, chapter 13

Gait EA (1906) History of Assam. Thacker, Spink & Co., Calcutta, 2006 – Reprint LBS Publications, Guwahati, p 354

Godbole M (2000) Task force report about the number of illegal Bangladeshi immigrants in India. Quoted by Prakash Singh, former DGP, Assam, In Kumar BB (2006) Illegal migration from Bangladesh. Concept Publication Co, New Delhi, p 78

Guha A (1978) Immigrants and autochtones in a plural society: their interrelation in the Brahmaputra valley in a historical perspective. In: Dubey SM (ed) North-East India. A sociological study. Concept, Delhi, p 44

Hazarika S (2006) Illegal migration from Bangladesh: problem and long-term perspective. In: Kumar BB (ed) Illegal migration from Bangladesh. Concept, Delhi

Kumar BB (2006) Illegal migration from Bangladesh. Concept, New Delhi

Lyall CJ (1883) Report on the census of Assam. Government Printing Press, Calcutta, p 28

McSwiney J (1912) Census of India, 1911, vol III, Assam, pt. I, report, Shillong, p 5

Misra U (1980) Fresh tension in upper Assam tea belt. Econ Polit Wkly 15(3):1301

Misra U (2006) Historical aspects of the illegal migration from Bangladesh. In: Kumar BB (ed) Illegal migration from Bangladesh. Concept, New Delhi
Nair K (1961) Blossoms in the dust: the human element in Indian development. Gerald Duckworth, London, pp 139–140
Rai B (1993) Demographic aggression against India. B. S. Publishers, Chandigarh, p 175
Saikia A (2006) Global processes and local concerns. Bangladeshi migrants in Assam. In: Kumar BB (ed) Illegal migration from Bangladesh. Concept, Delhi, pp 187–211
Sarfaraz A (2003) Environmentally induced migration from Bangladesh to India. Strateg Anal 27:422–437
Sharma KM (1980) The Assamese question: a historical perspective. Econ Polit Wkly 15(31):1321
Sinha Lt. Gen SK (1998) Report on "Illegal Migration into Assam", para 1 of the letter to the President of India written on 8th November 1998

Chapter 14
Rural Settlements in North-East India

Abstract Over 80 % of the population in North-East India lives in 40,000 villages. Over two-thirds of these villages are in Assam. The mean size of villages varies from one physical region to another and even from one state to another. The hilly states of Arunachal Pradesh and Meghalaya have small villages. The size of a village in these states is constrained by the availability of flat agricultural land. A small patch of cultivable land on a river terrace or a structural bench along a sloping mountain front attracts a small settlement. The settlements do not grow by accretion because of the non-availability of additional land. In such situations, the young migrate to another site. The hilly states, like Arunachal Pradesh, have less than 10, often 3 or 4 villages per 100 km^2 of the area of the state. On the plateau of Meghalaya, villages are small, occupy small areas and yet are numerous. This is attributed to the clan structure of the society. By comparison, the villages in Nagaland are large in size. In fact, there are more large villages than small ones. A village of 5,000 people is a common site in Nagaland. These unusually large villages in the hilly Nagaland area are attributed to the offence as well as defence requirement of the Naga society. Interclan or intervillage conflicts were quite common in Naga society before the arrival of Christianity and the British administration. The mean size of a village ranges from 130 in the hills to 800 in Nagaland and over 2,000 in the plains of Manipur.

In Assam plain, the village houses are arranged in rows along a raised street, but in hilly areas of Mizoram, they cluster around a high point. A village in a hilly area is invariably a clan village, like an *Angami* or an *Ao* village, but in the plains of Assam, it is often a multi-clan, multi-caste or multireligious village, though dominance of a clan or a tribal group is quite common. In most villages, in Brahmaputra plain, there are people of different persuasions with a dominant group. In the villages with a large Hindu population, there is often a '*Namghar*' in the centre of the village where people congregate for prayers in the evenings or on special occasions.

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The entire population of the eight North-Eastern states (45.58 million in 2011), forming 3.8 % of the population of India, is distributed among 40,000 villages and 250 towns, spread very unevenly over an area of 263,179 km^2. The region is predominantly rural, and it has always remained so. About 82 % of the people live in the villages, which show wide variation in their size and density, not only from one state to another, but even inside a state. Each state, or even a part of it, has its own physical advantages and constraints, its own history, its own ethnic composition and its own cultural background, which together influence the location, size, distribution and the organisation of villages. Often, the traditional mode of living and the social organisation of a community are reflected in the size and organisation of rural settlements, which certainly carry the imprint of resource endowment of the region. Each state has, therefore, to be evaluated separately, throwing light on the way the people have chosen their occupation and organised themselves into rural communities.

14.1 Some General Observations

Except Tripura and Sikkim, all other states of the region show a remarkable increase in the number of inhabited villages. During the last century (1901–2001), the number of inhabited villages in the North-Eastern region grew from 15,584 to over 40,000, more than doubling their number. A steady increase in the number of villages is as follows.

In most cases, the number has tripled though with some interruptions, and in the case of Manipur and Nagaland, the number has multiplied more than fourfold (Table 14.1). The increase in the number of villages conforms to an increase in rural population. Growth in the population of an individual village could accommodate only a limited increase in population, depending upon the productivity of the peripheral land. Extending the revenue limit of the existing villages would only increase the distance between the village settlement and the fields making farming prohibitively expensive. In such a situation, the existing villages spawned new generation of villages. The repetition of this process produced a larger number of villages belonging to different generations, causing at the same time increase in their density.

The increase in the number of villages is much greater in the first half than in the latter half of the twentieth century. The available space may have been gradually filled up, the intervillage distances reduced and the spawning of new villages was no longer a viable option. While the number of villages more than doubled in a space of 100 years, from 15,584 in 1901 to 40,379 in 2001 in the North-Eastern states as a whole, individual states showed contrasting tendencies and pace of change. In Assam plain, the increase in the number of villages decelerated after 1950, while it remained constant in the case of Meghalaya. The hilly states of Nagaland and Manipur reflect the impact of socio-economic development, in the sudden spurt in the number of villages. The stoppage of certain age-old institutions, like head hunting and fratricidal wars, between the villages gradually faded away with the adoption of Christianity, and better governance in the hilly area witnessed the replacement of village chiefs

Table 14.1 Growth in the number of villages in North-East India between 1901 and 2001

States	Number of inhabited villages			Changes between 1901 and 2001 in %		
	1901	1951	2001	1901–1951	1951–2001	1901–2001
Arunachal Pradesh	–	2,451[a]	3,865	–	+57.6	–
Assam	10,133	17,842	25,124	+76.0	+40.8	+148.0
Manipur	467	1,601	2,315	+242.8	+44.6	+395.0
Meghalaya	2,865	4,059	5,782	+41.6	+42.4	+134.5
Mizoram	239	632	707	+101.8	+11.8	+195.8
Nagaland	292	512	1,278	+75.3	+149.6	+337.6
Sikkim	125	99	450	−20.8	+354.5	+260.0
Tripura	1,463	3.453	858	+136.0	−75.2	−41.3
Total	15,584	30,649	40,379	+80.9[b]	+31.17	+134.8

Sources:
1. Primary Census Abstract, Census of India 2001, p. 34. The figures for Manipur and Mizoram for 1901 and 1951 are taken from the Censuses of Assam of respected years
2. Census of India, 1951, vol. XII, Assam, Manipur and Tripura, pt. II A, p. 12
3. Census of India, 1901, vol. IV, Assam, pt. II, tables, p. 1
Notes: Nagaland in 1901 was Naga Hill district of Assam with an area of 7,948 km^2, contrasting with the present area of 16,579 km^2
[a]The figure refers to the year 1961, the first Census in Arunachal Pradesh
[b]The percentage excludes Arunachal Pradesh, as the number of villages in Arunachal in 1901 is not known

by government officials even at a lower level. This did away with the perpetual fear of attack by another tribe and the need for a large protected village. New settlements sprang up for the convenience of farming or even better living. Thus, the hilly states of Sikkim, Nagaland, Manipur and Mizoram show unprecedented growth in the number of villages (Table 14.2). The number of its villages in Assam more than doubled to accommodate its growing population.

14.1.1 Decline in the Number of Villages: Some Exceptional Cases

To the general trend of increase in the number of villages, there are few exceptions like Tripura and Mizoram. These states have undergone a change in the organisation of the villages, a fact reflected in the periodic decline in their number.

14.1.1.1 The Case of Mizoram

The fluctuations in the number of villages in Mizoram as seen in Table 14.3 are unprecedented.

The fluctuations in the number of villages in Mizoram are the result of the exigencies of a war-like situation faced by the state in the 1960s. The number of villages in Lushai hills, the original name of Mizoram, in 1901 was 239 that grew to 631 in 1951

Table 14.2 Density of villages per 100 km² and the average size of a village in 1901, 1961 and 2001

States and year	Rural area in km²	No. of villages	Rural population	Average size of village	Density of villages per 100 km²	Average land cultivated per village km²
Arunachal Pradesh						
1901	–	–	–	–	–	
1961	83,743	2,451	336,558	173	2.92	34.16
2001	83,743	3,865	870,087	225	4.60	21.60
Assam						
1901	77,476	10,133	3,212,606	317	13.07	7.64
1961	77,476	18,965	7,684,025	405	24.40	4.08
2001	77,476	25,124	23,216,288	924	31.20	3.08
Manipur						
1901	8,502	467	212,231	454	5.50	18.20
1961	22,176	1,601	574,162	359	7.20	13.90
2001	22,176	2,315	1,717,982	742	10.40	9.58
Meghalaya						
1901	22,199	2,865	330,093	115	12.90	7.70
1961	22,199	4,059	547,162	135	18.28	5.46
2001	22,199	5,782	1,864,711	323	26.04	3.83
Mizoram						
1901	18,710	239	82,434	345	1.27	78.20
1961	20,494	632	189,252	300	3.08	32.42
2001	20,494	707	447,567	633	3.44	28.98
Nagaland						
1901	7,948	292	99,309	340	3.67	27.20
1961	16,431	512	208,850	408	3.12	32.09
2001	16,431	1,278	1,647,249	1,289	7.77	12.85
Sikkim						
1901		125	59,014	472	1.74	
1961		99	134,981	1,363	1.39	
2001	7,096	450	480,981	1,068	6.34	15.78
Tripura						
1901	10,345	1,463	166,910	114	14.14	
1961	10,345	3,453	596,434	173	33.38	
2001	10,345	858	2,653,453	3,093	8.29	12.05

Source: Census of India 2001, General Population Tables (India, States & Union Territories) table Statement I 6, 7 and 8, pp. 34, 36, 37 (for number of villages and rural population) other columns show calculated figures

Table 14.3 Variation in the number of villages in Mizoram between 1901 and 2001

Year	Number of villages	Year	Number of villages
1901	239	1981	721
1951	631	1991	698
1961	730	2001	707
1971	229		

increasing further to 730 in 1961, to drop precipitously to 229 in 1971, to rise again to 721 in 1981. The sudden decline in the number of villages in Mizoram, appearing in the 1971 census record, symbolises the Union Government's repressive measure, to contain the revolt spearheaded by the Mizo National Front. What happened during those years was a forced clustering of the villages by the Indian Armed Forces. The villagers were forced to vacate their village, taking with them as much of their belongings as possible, within a short period, usually 12 h, and then these villages were burnt, annihilating any chance of the return of the villagers to the burnt settlement where they were living for centuries. To control the insurgency of the Mizo National Front, which culminated into a revolt, the entire rural population was shifted and confined in a few settlements, ironically called 'protected and progressive villages'. This caused the decline in the number of villages from 730 in 1961 to 229 in 1971. After normalcy was restored, it has taken three to four decades to restore the rural structure of Mizoram.

14.1.1.2 The Case of Tripura

A decrease, recorded in the number of villages in Tripura in 1981, is attributed to a restructuring of the village boundaries in the 1970s. It appears that no cadastral survey was done in Tripura before 1972, and a large number of small units cultivated the adjoining land without there being a specific revenue boundary.

Tripura became a full-fledged state after remaining a Part 'C' State for some time, and then a single district Union Territory of Tripura, and attained a full-fledged statehood in 1972. The reorganisation of the state that followed resulted in the division of the state into three and then four districts. A cadastral survey was undertaken, and very many small hamlets were merged into one, giving them the identity of a single revenue as well as inhabited village. This brought down the number of inhabited villages notionally; in reality the old hamlet settlement continued, but for administrative purpose they were clubbed together to form lesser number of large-revenue villages. Thus, while the number of villages was 3,454 in 1951 and 4,727 in 1971, the number dwindled to 856 in 1981, and it remained so even after two decades with 858 villages in 2001, an insignificant addition of two villages.

A necessity for survey and reorganisation of villages in the state arose following the huge influx of refugees from Bangladesh, which evoked conflict between the indigenous village population and the newly arrived refugees. The increase in the number of villages is accompanied by an increase in the mean size of a village in all the states of the North-East. The largest increase, however, is in the case of Mizoram and Nagaland. Better security conditions and reduction in internecine warfare caused not only an increase in the population of Nagas and Mizos but also in the population of individual villages. The additional population in the hilly states because of natural increase and a combination of causes including immigration led to the enlargement of individual villages. The increase in population initially gets itself absorbed in the village, with the building of some additional houses until it becomes economically disadvantageous. Part of the population then moves out to develop another settlement.

Table 14.4 Number of villages in different size groups for North-East Indian states (2001)

	Number of villages in different size groups							
States	<200	200–500	500–1,000	1,000–2,000	2,000–5,000	5,000–10,000	>10,000	Total
Arunachal	2,760	682	266	126	26	3	–	3,863
Assam	4,735	6,018	6,233	5,439	2,495	185	19	25,124
Manipur	749	731	326	202	157	28	6	2,199
Meghalaya	2,753	2,090	690	185	60	4	–	5,782
Mizoram	142	258	198	76	31	1	1	707
Nagaland	104	323	372	253	171	50	5	1,278
Sikkim	42	82	157	120	40	9	–	450
Tripura	12	55	99	188	370	106	28	858
Total	**11,297**	**10,239**	**8,241**	**6,589**	**3,450**	**386**	**59**	**40,261**
In percent	**28.05**	**25.43**	**20.46**	**16.36**	**8.56**	**0.96**	**0.14**	

Source: Census of India 2001, General population Tables (India, States and Union Territories) table A-1, A-3, pt. 1 table A-3, Villages by population size class pp 205–215

14.2 Size and Distribution of Villages

The village density as well as the size of individual villages is closely linked to the productivity of the land. Thus areas, which are mountainous and hilly, usually, have smaller villages than the plains where large population of a village could be supported by the fertile command area of the village. While this may be a thumb rule, there are other criteria, which may thwart or encourage the prospect of a village gathering mass beyond the immediate agricultural base with poor soil capability. Such settlements don't entirely depend on agriculture and in many cases practise other occupations like fishing and hunting.

Taking all the eight North-Eastern states of India as a unit may not be justified for an analytical understanding of the villages, yet it may offer a broad hint at the village size in general in this part of India. About three-fourths of the villages in the North-East have a population size of less than a thousand, and more than 50 % have a population of less than even 500 (Table 14.4). That shows a preponderance of small villages in the region. Only 1 % of the villages have a population of over 5,000, majority of which lie in Tripura, a few in Assam and 5–6 in Manipur and Nagaland.

Individually, the size distribution in the case of Arunachal is highly skewed in favour of very small settlements, over 70 % of them consisting of only a few houses in small hamlets. Similar is the case in Meghalaya, where a vast majority have a population between 200 and 500, and not even 5 % of the villages have population of over a thousand. Sikkim and Mizoram have a distribution that is close to normal, the median size of their village being close to 1,000. The villages in Nagaland and Tripura are usually large, the former being a historical legacy while the latter showing a change in organisation structure of the villages following a revised survey, as a result of which, the number of villages in 2001 dropped to 25 % of what it was in 1951. In Nagaland, the villages have been usually large because of internecine wars

Table 14.5 Mean and median size of the villages with rural village and population density

State	Rural area in km^2	Rural population	Rural population density per km^2	Total no. of villages	Mean size of the villages	Median size of the villages	Mean revenue area of village	Village density per 100 km^2
Arunachal	83,743	870,087	19.38	3,863	225	133	21.60	4.60
Assam	77,476	23,216,288	299.65	25,124	924	645	3.08	32.40
Manipur	22,176	1,717,928	77.46	2,199	781	368	10.08	9.90
Meghalaya	22,199	1,864,711	83.90	5,782	322	219	3.83	26.04
Mizoram	20,494	447,567	21.83	707	633	447	28.90	3.44
Nagaland	16,431	1,647,249	100.25	1,278	1,289	786	12.85	7.70
Sikkim	7,096	480,981	87.78	450	1,068	904	15.76	6.34
Tripura	10,345	2,653,453	256.40	858	3,093	2,616	12.05	8.29

Source: Census of India 2001, General Population Tables (India, States and Union Territories) table 1-A, pp. 58–63, Mean, median size of villages, mean revenue village and village density are calculated by the authors

N. B. The rural areas of Sikkim and Arunachal Pradesh are not available and hence the entire area of the state is taken

requiring a large number of able-bodied male adults, both for defence and offence. Such feuds among the Nagas were not infrequent and could erupt any moment, often seeking vendetta.

The Angami Nagas in south Nagaland have acquired the skill to practise sedentary cultivation of rice on terraced fields using hill spring water for irrigation, channelised along the contours. Such cultivation giving a high yield could support a large mass of people. The result was the accretion of large villages that, besides being economically independent, could assert their strength in times of offence as well as defence. About 20 % of the Naga villages have a population of over 2,000, a large number have a population of over 5,000, and the population of a few villages exceeds even 10,000, without there being a trace of urban function.

In the states of Assam and Manipur with their population largely concentrated in the plains, the former in Brahmaputra and Barak valleys and the latter in Imphal plain, the size distribution of villages in both cases, though closer to normal, shows greater concentration in the valleys having a population of less than 500. To bring clarity to this aspect, the mean and median size of villages in each state is given in Table 14.5.

As can be seen from Table 14.5, the revenue area that forms the support base of a village is inversely related to the population density of the state. The fertile soils in the alluvial plains mean greater agricultural productivity and a larger support base attracting more population. In such a situation, even a small revenue village can support a moderate large village. With the lapse of time, it may turn counterproductive as a state with a very high population density, and an equally large village density will have less of land to support the village. While this may be a general rule, the nature of terrain, soil productivity, facilities for irrigation and the vulnerability to natural hazards, which are frequent in the region, greatly affect the clustering of population and the villages.

Assam, with its fertile Brahmaputra and Barak basins, despite their vulnerability to floods, has the largest village density with 32 villages per 100 km^2 of area, each village commanding an area of 3 km^2. With a large number of small villages (83 %), having a population of less than 500, the village density in Meghalaya with 26 villages per 100 km^2 is the second largest in the region. Manipur has a density of around 10 villages per 100 km^2. All other states of the region have a village density of less than 10 per 100 km^2. Theoretically, thus, most states of the North-East have quite a large area at the disposal of each village, varying from as large as 29 km^2 in the case of Mizoram and 22 km^2 in Arunachal to as low as 3 km^2 in Assam. Arunachal is a unique case and is the least developed state in the country, where majority of the villages, with a population of 50–100, occupy mid-level hillside flats or upper terraces, surrounded by forested territory. Similar is the case with Mizoram where a large-scale restructuring of settlements, as described earlier, took place in the late 1960s, reducing the number of villages. It took a couple of decades to restore the villages to their original sites. On an average, Mizoram has an area of 29 km^2 for each village giving a density of 3.44 villages per 100 km^2 area. All other states have a village density of around 10 villages over an area of 100 km^2, giving each village a revenue area of roughly 10 km^2 or more.

To introduce an element of comparison, one may compare North-East India with Bengal, which has a mean rural area of 2.25 km^2 per village, or Rajasthan which has an area of 5.75 km^2 per village. India as a whole has 593,732 villages spread over 3,118,237 km^2 of rural area, thus apportioning on an average 5.25 km^2 of land per village.

14.2.1 Interstate Variation

Inside each state, the rural settlements vary in mean size, density in space and the mean revenue area at the disposal of each village. In the most thinly populated *Arunachal Pradesh*, with an overall village density of 4.6 per 100 km^2, there are areas like Tawang, East Kameng, Changlang and Tirap, which show a high village density of 7–8 villages in an area of 100 km^2. In contrast, the hilly frontier zone of Dibang valley and Upper Siang in eastern Arunachal, and West Kameng bordering Bomdila, has 1 or 3 villages per 100 km^2 of territory.

In *Nagaland*, the Dhansiri plain of Dimapur district and the Zunheboto district drained by two rivers, a northward-flowing tributary of Diyung and another river Texu flowing southward, have a more productive land and show a higher village density varying from 15 to 25 villages per 100 km^2 of area. The rest of Nagaland being largely hilly, there are no more than 5–6 villages in an area of 100 km^2. This is in sharp contrast to the size of the village. The areas like Mon district in the extreme north of the state and Tuensang on the east, though having low village density, have larger villages sometimes exceeding a population of 10,000. Kohima district also has some large villages. Kohima village, a veritable annexe to Kohima city, is believed to be the largest village in India.

The rural landscape of *Manipur* is resolved into distinct domains, the mountainous region of north-east, north-west and western Manipur on one side and the Imphal plain with its extension into Bishnupur, Thoubal and Chandel districts on the other. The mountainous areas surrounding the Imphal plain have a low density of villages such as Ukhrul district in the north-east and Tamenglong in the north-western part of the state. Both these hilly areas have a density of about 4 villages per 100 km^2, each village commanding over 20 km^2 of area on an average. The Imphal plain, on the other hand, is crowded with villages with a density of more than 20 villages over an area of 100 km^2. It must be pointed out that there has been an overall increase in the number of rural settlements in the region and their number increased from 173 in 1960 to 490 in 2001(Singh and Singh 2008). This is also reflected in the rural population density of the plain, lingering around 400 persons per km^2, in contrast to the mountainous outlying areas where the population is as low as 25 persons per km^2.

Over two-thirds of the villages of Manipur have a population of less than 50 persons, and over 80 % have a population of less than a 1,000 people. All these small villages are found in the hilly north-western, western and north-eastern part of the state. Some of the largest villages of Manipur are located in the fertile Imphal plain, and some of them attain a size of more than 10,000 persons. Bishnupur and Thoubal districts occupying practically southern half of the Imphal plain have a preponderance of large villages. Over three-fourths of the villages in the area have a population of 1,000 or more, and over half of them have each a population more than 2,000, a substantial number have over 5,000, and a couple of them have a population of over 10,000. The fertile alluvial basin of south Imphal is the rice bowl of Manipur. It has a high density of population and relatively closely spaced large villages. On this area, a revenue village of 2 km^2 can easily support a large village with a population of 5,000 or more.

Mizoram, with 707 villages, shows a very low density of rural settlements varying between 2 and 5 villages per 100 km^2 of rural area. More than half the number of villages in the state have a population of less than 500, and 85 % have a population of less than 1,000, leaving only 15 % of the villages with over 1,000 people, and a few have a population of over 2,000. Quite a few villages in Mizoram with a population of even less than 5,000 have been notified as towns. The density of villages is relatively higher in the southern districts of Lawngtlai and Saiha.

Tripura has a rural landscape that is characterised by large and well-organised villages in South and West Tripura, whereas in Dhalai (the central-eastern part) and North Tripura, the villages are relatively small. Relief and land productivity, both, have played a part in this aspect. Dhalai, the eastern district is largely hilly, has a low density of population with a high proportion of tribal population. This explains the absence of large villages (Photo 14.1).

In *Meghalaya*, the number of villages is relatively high and more uniformly distributed as compared to other hilly states of the North-East. It may be attributed to the physiographical character of the area. Leaving a few high peaks like Nokrek in the southwestern part, the state is a typical plateau and extremes of relief is not frequent the area is a plateau, and extreme contrasts of relief are not frequent.

Photo 14.1 Village in Tripura state, 40 km southeast of Agartala in the midst of groves

The overall density of the villages is 26 villages per 100 km^2 giving a mean area of 3.8 km^2 per village. The village density is the highest in the western part of the plateau coinciding with West Garo Hills. West Garo Hill district with 1,469 villages has one-fourth of the total number of villages in the state with only 16 % of the area. The villages are relatively small with 85 % of the villages having a population of less than 500, and almost half of them have a population of less than 200. A large part of West Garo Hill district, especially its western part, bordering Brahmaputra, is similar to Bangladesh. It is an alluvial plain with well-adopted rice cultivation where Garos, in small groups, cultivate the land. The eastern hilly extension of the district, known as East Garo Hills, has a lower density of villages with each village having a revenue area of over 3 km^2. South Garo Hills, overlooking Bangladesh, is not very different from East Garo Hills. Largely a hilly terrain, this is the most inaccessible area of Meghalaya where there is hardly a village with a population of over 500 people, and three-fourths of the villages have a population of less than 200. The area also has the lowest population density in the state with 55 persons to a km^2. The lowest village density in the state is found in Jaintia Hills, which has 12 villages per 100 km^2 with some large villages. About 20 % of the villages have a population of over 1,000 people. The mean village size of 586 is also the largest among the districts of the state. The area north of Shillong down the slope to Brahmaputra has a very dissected terrain with low village density and relatively small villages with larger area at their command.

East Khasi Hill district spread around the state capital, Shillong, has the highest number of villages with mean resident population of 416 per village, a bit lower

than what one finds in Jaintia Hills. Large villages, i.e. those with a population of 2,000 and above, are almost absent. The influence of the state capital Shillong is apparent.

14.2.2 Rural Settlement Distribution in Assam

Assam, with just about 30 % of the total rural area of the North-East, has over 60 % of the total number of villages. The state has 25,124 villages spread over 77,476 km^2 of its rural space; that is 98 % of the total area of the state. The urban centres do not occupy even 2 % of its geographical area. The mean revenue area per village in Assam is 3.08 km^2, and the density of villages per 100 km^2 of rural area is 32.4 villages, the highest among all the North-Eastern states. The mean population of a village is 924.

These statistics grossly present a picture of rural Assam, which is marked with contrasts from Brahmaputra flood plain to the hilly areas of Karbi-Anglong and North Cachar Hills. The areas with a high density of population have almost large villages, whereas those with a lower density have smaller villages. Assam, as a whole, has a rural population density of 300 persons to a km^2; but there are districts like Dhubri, Nagaon and Karimganj which have a rural population density of more than 500 persons to a km^2. In these districts, the mean village population is larger. Another type of area, with not a very high density of population yet having large villages, is represented by low-lying areas of Cachar where large part of area, even after the recession of floodwaters, remains submerged in water. In such areas, villages have developed on selected high grounds that are immune to frequent floods and well above submerged areas, locally known as '*hoaras*'. In such a case, the large size of villages compensates for the low village density. Cachar has one of the lowest village density, with 28 villages over an area of 100 km^2, contrasting with a village density of 52 for North Lakhimpur, 48 for Dhubri and 41 for Morigaon. Cachar and Hailakandi in Barak valley have widely spaced large villages. The mean size of a village in Cachar is 1,187 and in Hailakandi it is over 1,500.

At the other end of the spectrum, there are cases of low population density and equally low village density matched with small size of villages. This is the case of hilly districts of Karbi-Anglong and North Cachar Hills. Karbi-Anglong has, on an average, 28 villages per 100 km^2 of rural area with a mean village population of 246 persons per village, whereas North Cachar Hills has 13 villages per 100 km^2 with a mean village size of 200 people.

Thus, the size and density of rural settlements vary from region to region even in a single state as Assam. This can be explained by taking into account the relief, susceptibility to floods, the productivity of the soil and accessibility. There is no typology, but distinct areas emerge with different density characteristics.

1. Areas with low village density and small mean population per village
   (a) Hilly areas, like Karbi-Anglong and North Cachar Hills

(b) Forested areas like Kokrajhar and Tinsukia
(c) Partly hilly areas like Golaghat

2. Areas with mean village density and large-sized villages. This is typical of the middle Brahmaputra plain, represented by the districts of Kamrup, Barpeta, Nalbari, Darrang, Morigaon and Nagaon (Fig. 14.1).
3. Villages with above average population density, above average village density and large mean village population. Such areas are districts of Dhubri, Marigaon and Karimganj.
4. Areas with high village density but low per village population. Such areas are the districts, generally lying to the north of Brahmaputra, like Sonitpur, Lakhimpur, Dhemaji and Dibrugarh. These are the areas with large tea plantations, where the tea gardens with their coolie lines work as the central place, and small villages usually below 1,000 have not grown much nor have they acquired any central functions. Vulnerability to floods, as in the case of Dhemaji, also may have retarded the development of large villages.

Summary

Large villages are typical of Nagaland and Tripura despite contrasting relief conditions and divergence in their agricultural productivity. Both these states have developed large villages. In the case of Nagaland, ridge top villages have been allowed to grow large because of strategic considerations and reasons of defence, while in Tripura, large villages have resulted from the reorganisation of revenue villages in the mid-1960s. Other hilly states, like Arunachal Pradesh and Mizoram, have small villages as expected, with a low village density. Meghalaya is an exception where the number of villages is relatively high, next only to Assam, with a high village density but small and very small villages. Clearly, there is no possibility of the growth of many large villages where the plateau is agriculturally less productive. Assam valley has the highest density of population as well as village settlements, with medium to large villages, except in the hilly areas of Karbi-Anglong and North Cachar Hills.

14.3 Village as a Socio-Geographic Unit in North-East India

A village in the North-East, as anywhere else, is a socio-geographic unit with agriculture as an economic base. It has a specific location, occupying three-dimensional space, and commands a revenue area that forms its agricultural support base. It consists of a cluster of houses with families having the same or varying ethnicity, caste, trade and professions, but largely dependent on agriculture.

There is a large variety of villages in the North-East, occupying different physical terrains like plains, hills and plateaux choosing their own locational niche. They vary in their morphological organisation, house types, clustering of the houses and internal communication.

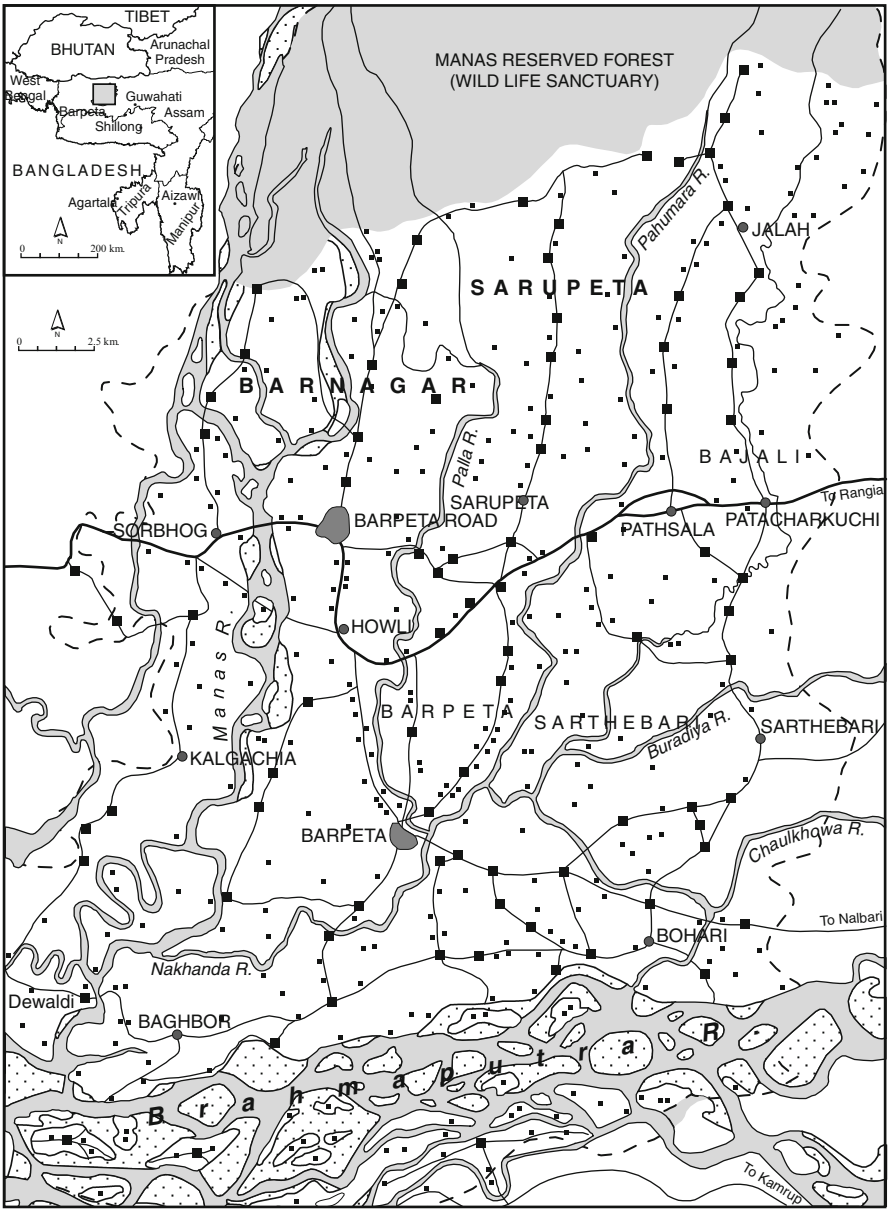

Fig. 14.1 Pattern of distribution of rural settlements in Brahmaputra plain, a view from Barpeta district (Adapted from National Mapping and Thematic Organization, Kolkata Government of India (2001). District Planning Map of Barpeta (Assam))

A village in Brahmaputra plain is very unlike the villages in the Gangetic plain where these are often compact with wall-to-wall houses and narrow lanes separating rows of houses, one indistinguishable from the other except by the door openings.

The villages in Assam plain are a loose collection of houses, often sited on a slightly higher ground, in the midst of paddy fields, on the margin of a forest, on a roadside, or in the midst of agricultural land connected by an approach road.

The largest of villages of Assam are found in the western region, west of Guwahati. With the exception of Bongaigaon, most districts, viz. Kokrajhar, Dhubri, Goalpara, Barpeta, Kamrup and Nalbari, have large villages. Some of the largest villages with a population of 10,000 are found in Kokrajhar district. Leaving aside a narrow strip of '*duars*' at the southern end of Bhutan, the area is completely flat with a preponderance of water bodies yet relatively free from the havoc wrought by Brahmaputra, in the upper Brahmaputra valley. Large villages also result from the higher rural population density in the western district like Dhubri, Barpeta and Nalbari. Nalbari has the highest rural population density in Assam. Nagaon and Karimganj are the only districts with a comparable rural population density.

14.3.1 Village Morphology and Typology of Houses

The rural settlements in the western region of Assam, sandwiched between Bhutan *duars* on the north and Brahmaputra on the south, are often north–south oriented. These are strung along transport routes that follow the interfluves between the parallel and subparallel tributaries of Brahmaputra debouching from Bhutan Himalayas. The broad interfluves provide the villages the necessary farming land accessible from the still higher central part of the divide on which the villages are located. Some excellent examples can be seen on the routes following the divides between Manas, a tributary of Brahmaputra, and its sub-tributaries between Manas Wildlife Sanctuary on the north and the Brahmaputra on the south. The principal routes are also oriented north–south. On these routes, there are large villages with smaller ones lower down, on either side of the divide. Transport routes, which usually follow high grounds in this part, are vital to keep away from the surging waters during floods. It is also possible that these villages are very old and were connected by roads later on.

In the plain south of Brahmaputra, the villages are more linear. Avoiding hilly, forested and marshy land, the villages extend interminably until another village is encountered. Sometimes, a large linear depression, the deserted course of some river that is marshy or completely flooded during monsoons, is avoided by villages to locate themselves on their periphery to utilise these depressions as fishing grounds (Photo 14.2).

In the Barak plain, a southern counterpart of the Brahmaputra plain, enclosed by Barail range and North Cachar Hills on the north and the forest-clad Mizo Hills on the south, the villages occupy suitable locations that ensure enough agricultural land. The region has a large number of tea gardens occupying relatively higher levels, with a large number of garden villages on a level intermediate between the flood plain of Barak and the piedmont of North Cachar Hills. The flood plain of Barak is slightly lower than its well-defined banks, and even a moderate flood submerges it under a thin sheet of water, which spreads over a large area. In such a situation, the villages are sited higher than the normal flood level.

Photo 14.2 Village close to Nagaon, homestead garden with areca nut palms

Despite the flood proneness, the village settlements are aligned east–west along Barak and north–south along its southern tributaries like Sanai, Dhaleswari, Singla and Langai avoiding the *bils*, which occupy sometimes as large as 25 km^2 of area. The risk of damage by flood is considerably minimised by erecting embankments along the banks of these rivers. The urban centres like Silchar, Badarpur and Karimganj are the beneficiaries of such embankments, which, as the author found, were very compact and impregnable near the towns.

The middle and eastern part of Brahmaputra plain (north) is dotted with villages, which are north–south oriented in Darrang and east–west in Sonitpur, Lakhimpur and Dhemaji districts. The village size progressively decreases from west to east, from a mean village size of over a thousand to 700 at Lakhimpur to a little over 400 in Dhemaji. The village settlements in this part carry the imprint of early introduction of tea plantation and a massive immigration of labour from Nepal, Eastern Uttar Pradesh and Orissa. The tea labour settlements are large and carry many central functions like a post office, a police station, a medical store, a grocery and even a medical practitioner. Such settlements initiated in the late nineteenth century grew into central places. In Lakhimpur and Dhemaji, the rural settlements are located parallel to contours, preferably above the flood line, shrouded in bamboo groves and clumps of trees.

14.3.1.1 General Characteristics of a Village in Assam

A village is always signalled by bamboo groves on its periphery, behind which it is hidden. A roadside village has a fishing pond on the margin of the village, and the

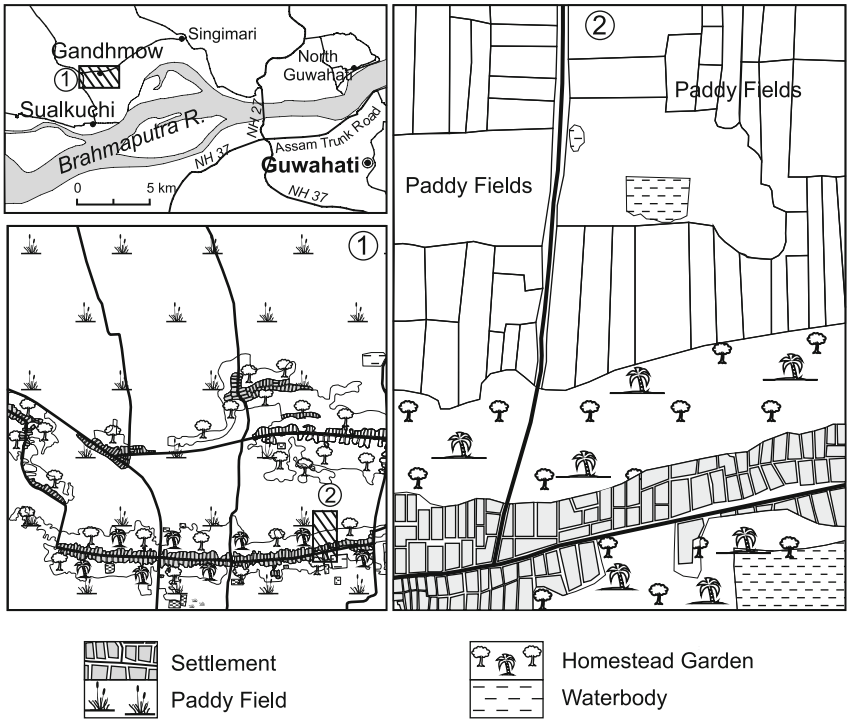

Fig. 14.2 Lay-out of a village in Brahmaputra plain – Gandh Mhow – located about 25 km west of Guwahati (see Photo 14.3)

approach to the village is often over a narrow elevated passage. Houses have an open courtyard with rooms on two or sometimes three sides. Most of the houses have a kitchen garden growing vegetables like cabbage, cauliflower and spinach in the backyard with some fruit trees of which areca nut and coconut are very pronounced. Jackfruit and mangoes are other fruits, besides betel nut, which are grown. Individual houses as well as the villages seem to be surrounded by greenery (Fig. 14.2). A larger village may have one or two internal lanes along which houses, widely separated from each other, are arranged. A few shops selling groceries are observed, and in the villages largely inhabited by Hindus, there is a centrally located temple, called '*Namghar*'. It is not uncommon to see one part of the village having better built houses, with masonry walls and tin roofs, and other part with a cluster of thatched huts. Prosperous people have typical Assam-type houses (Photos 14.3 and 14.4), which have a symmetrical outline with masonry walls, timber frame and tin roofs with proper ventilation and a small garden in front. Such houses appear more like individuals bungalows.

In some large villages, there is a distinct spatial clustering of houses of different communities. In such a village, Assamese Hindus, Bengali Hindus, Bodo-Kacharis and immigrant Muslims are found settled close to each other. It is not a general rule but Bodo-Kacharis usually occupy the fringes of the forests, the Assamese Hindus

Photo 14.3 Gandhmow village (see also Fig. 14.2)

Photo 14.4 Namghar (temple) in Gandhmow

remain tied down to the paddy fields, in one or several clusters, and Bengali Hindus occupy the land not so close to rice fields, whereas the immigrant Muslims occupy the most inhospitable part of the village, usually the western side. There are villages in Nagaon, Goalpara and Dhubri districts dominated by Muslims. Kusum Nair (1961) quotes the case of Rangloo primary Panchayat in Kathiatoli block in Nowgong district where out of 342 families, 26 are Hindus, 37 native Muslim households and 279 immigrant Muslim families from Mymensingh of Bangladesh, settled before 1940. She thinks that the immigrant Muslims coming from Mymensingh district were, it appears, the first to introduce jute cultivation in Assam, but what is surprising is that they continue to hold a virtual monopoly of it.

Discussing the socio-economic landscape of Bojali, a collection of 57 villages in north-eastern part of Barpeta, Barman (1984) shows the preponderance of '*bils*', the cut-offs, following a shift in the position of the meanders of the tributaries of Brahmaputra, and '*pukhris*', tanks built for irrigation and fishing, and the cultivation of '*sali*' and '*ahu*' varieties of paddy. The villages though compact, arranged linearly above flood level, often oriented north–south, occupying the divide line of drainage lines. Here also, a number of communities occupy the village and cultivate the adjoining land. The kitchen garden so typical of plain villages in Assam is also an element of towns, as the latter are very sparsely populated. Kalita (2003) has quoted the case of Pathsala town in Barpeta district, which also houses migrants from Bihar, Uttar Pradesh, Punjab, Orissa, Rajasthan and Manipur besides Nepal, who are usually non-cultivators. In this, each family grows a variety of trees in front- or backyard of the house, coconut and areca nut being most common.

14.3.2 Villages of the Hilly and Mountainous Region

The rural settlements in *Arunachal Pradesh* are aligned along to the river valley, avoiding the high and sometimes badly dissected interfluves. Only in a few cases, the residential flat plateaux with easy access are occupied by settlements. A general principle for almost all the tribes has been to site the villages on the lower segment of the slopes, close to the river, where wet cultivation is practised on the lowest river terraces, and the upper slopes, upward from the villages to a distance of over 3 km, are used for shifting cultivation. In most villages, the houses are often on stilts, bamboo being the main building material. During the last half century, the scene has changed, and progressively greater use of tin is made as a roof material (Photo 14.5).

The Mishmis, extending from Lohit to the eastern half of Dibang valley, have large and small villages, but their houses are usually long, divided into sections with each section having a fireplace and meat bowl hanging over it for smoking.

The Adis and Abors occupying part of Dibang valley district and much of East and West Siang districts have their villages on hill slopes overlooking a river. On the slopes above the village, they practise shifting cultivation and have now started wet cultivation of rice on lower river terraces. The Adi villages are often large sometimes having 150–250 houses. The houses usually are 15–20 m in length and

Photo 14.5 Monpa House near Tawang, Arunachal Pradesh

6–9 m in width with a hearth in the centre and a veranda or porch in front. In well-organised Adi villages, whether belonging to Adi-Gallongs or Adi-Minyongs, the houses are built on timber frame and have bamboo flooring, usually a metre above the ground, and doors and walls made of planks and a thatched roof sloping down from the central rib on both sides almost touching the ground. This traditional type of house is in many cases replaced by tin roofs. The use of masonry walls is rare. Drinking water is brought from higher springs channelised in bamboo pipes. Like many other tribes, Adis also have a bachelors' dormitory called '*morang*' which also serves as a place for meeting the village elders, the *gams*, to deliberate on important issues facing the village community. The Hill Miris and the Nishis formerly known as Daflas have small villages consisting of 10–12 houses. The villages are usually on mid-level terraces at considerable height on the backdrop of some range. The houses are scattered, neither arranged in rows nor in clusters. Even more than a century ago, Dalton (1872) described the existence of 238 *gams*, or village settlements (Photo 14.6).

14.3.2.1 Naga Villages

As mentioned earlier, majority of the Naga villages are large, born out of necessity for defence against other villages and communities. Kohima village on the fringe of Kohima city is thought to be the largest village in the country. It seems during the Burmese invasion, many villages were looted and burnt and have since been rebuilt. They are generally built on a divide, hill or a ridge top, often arranged in regular

Photo 14.6 A Nishi village on the foothills of Arunachal Himalayas, 20 km north of Itanagar

streets as in the case of Ao and Lotha Naga villages. In Mokokchung and Wokha districts, respectively, Angamis and Semas have compact villages, often enclosed by a village wall. The Angami occupy much of Kohima district whereas the homeland of Semas is Zunheboto district. The village fortification that was an invariable feature of village about a century ago is a thing of the past. There are no more strong fortifications and deep ditches with '*punjis*', and massive stones surrounding the village. The entrance to the village used to be through a narrow winding lane. The footpath and approach way to the village were kept steep to make it as difficult as possible for the enemies. The Angami villages, today, are more compact with several '*khels*', though the houses are not at the same level. The famous Angami village Khonoma that valiantly repulsed the British Attack around 1880, about 25 km from Kohima, has a compact built, yet it has a confused arrangement of houses at several levels where groups of houses belong to specific clans. Most houses in Khonoma are built of stones and even bricks with a relatively modern design.

The traditional Naga house is large, with a width of 8–12 m and a length of 10–20 m. The front wall is made of planks. The houses have a gabled roof thatched with grass or palm leaves and projected sideways almost touching the ground. In a few cases, a house may have an enclosure where cattle can be tethered, the pigsty occupying a corner of this enclosure. The large elongated house is usually divided into three rooms. The front room is used for storing grains in baskets, the central or inner room has a hearth around which are benches for sleeping and sitting. A small room in the rear contains liquor tub meant for brewing and storing rice beer. The Ao Nagas have even today a bachelors' dormitory, the '*morung*', at the entrance of

the village where young bachelors of the village, charged with the responsibility of guarding the village, spend the night. The institution is fast disappearing. The Angamis and Semas don't have *morungs*. In the eastern part of Nagaland around Noklak, there are small stone houses where the roofs are covered with slate.

In *Imphal plain*, the villages are sited in the midst of rice fields, covered with bamboo groves. The plain villages are large and are located far apart. These have well-appointed houses with gardens surrounded by a mud wall. The land around the house is often sown with mustard. Unlike the houses of Assam plains, the Manipur villages do not have plantain, coconut or areca nut in every house garden. The villages in the hilly region of Manipur, inhabited by Nagas and Kukis, have closely spaced houses without gardens. The Naga villages of Manipur are as large as are those in Nagaland.

The villages in *Mizoram* are small and they are always located on the ridges and hilltops. A traditional Mizo village, located on a hill spurs, had usually 40–50 houses. In the 1960s and 1970s, many of the villages were known as the 'protected and progressive villages' accommodating the population of a number of adjacent villages which were compulsorily vacated and the residents forced to migrate to these predetermined villages. Another change that took place is the setting up of some model villages for those who were induced to take up terracing and terraced cultivation. The traditional residential house of the Mizos has a bamboo platform raised on stone or wooden columns, walls of bamboo mats without mud plaster and grass-thatched roofs. The better houses that have lately come up in large number are making use of tin roofs. In improved buildings, the floor is of wooden planks, supported by wooden columns, split bamboo walls and tin roofs. A single large elongated room that stands for a house is divided in two parts, residential and non-residential. The non-residential part shelters rice pounding '*dhenki*', cattle and poultry sheds, while the residential part is all-purpose house, sleeping, cooking and storing grains. Usually, the two sections of a house together admeasure 15–20 m^2. In Karbi-Anglong and North Cachar Hills, small villages perched on hillocks 300–400 m high are the rule. Usually these are close to a rivulet or some source of water, and the land between the village and the water source is used for *jhuming*.

Unlike Nagaland having a small number of large villages, *Meghalaya* has an unusually large number of small villages, each having a population of about 300, distributed among 50–60 houses. This has been so for generations even before the British took over Jaintia Hills, Khasi states and the Garo Hills. A village on the Meghalaya plateau occupies a small patch of land in a selected area that is comparatively better suited to some wet cultivation with the adjacent forests for *jhuming*. Defence does not seem to have weighed with the Khasis, the inhabitants of the two-thirds of the plateau, as there was a system of governance with large number of '*syiems*' and the disputes between them were settled by 'discussions' at the '*durbars*'. Hostilities seldom resulted into village violence.

The villages in the Garo Hills vary in size from small ones containing less than twenty 20 dwelling units to those having 100–150 houses (Photo 14.7). In the plain region, bordering Goalpara district, the houses usually occupy undulating land often supported on stilts. An average house has a length of 25 m, but sometimes these could be as long as 70–80 m, as it is the case with the chief's house. In a large house,

Photo 14.7 Traditional Garo hut with three sections and a balcony

half the length is open from side to side in the centre of which is the family hearth. The other half carries small enclosure-like chambers, usually on the right side meant for married members. The unmarried young people live in a separate house called '*nokpantes*', the bachelors' dormitory, an Assamese term equivalent to *morang* of Nagaland.

In *Tripura* leaving aside the central-eastern highland and the flat land on Bangladesh border, much of the land is resolved into '*tillas*', the low-level hillocks or mounds, and '*lungas*', the flat lowland. A village could locate anywhere on a slightly elevated flat ground surrounded by rice fields. For convenience, the villages were sited close to the fields, in the form of small hamlets. These settlements exist as they were earlier, but after the cadastral survey and the delineation of revenue village, many hamlets were clubbed together bringing down the number of villages. There are only a couple of villages with more than 5,000 inhabitants. Dominated by immigrant Bengalis, the village in the western half of the state is inhabited by several castes and communities. The eastern parts of the state, inhabited by indigenous tribes, have villages on higher grounds on which thatched houses stand in the midst of bamboo grooves.

14.3.3 Typology of Rural Settlements

Based on the village and house characteristics, on their layout, morphology and functional organisation, one can recognise broadly three domains, which represent different typologies.

Photo 14.8 An Apatani village at Ziro (Lower Subansiri) in Arunachal Pradesh (Photo S. R. Jog)

1. The Assam plain type
2. The Arunachal hilly type
3. Eastern mountainous Nagaland and Mizoram type

1. The plain villages of Assam could be large or small, but these have open houses with compound and kitchen garden often planted with bananas, areca nut and coconut or bamboos. Houses are made of mud or bricks. The subtypes of houses include the typical Assamese bungalow with great symmetry, built in masonry, a tiled roof a veranda with two rooms on each end. A poor house is an open courtyard bordered on two or three sides with mud walls and thatched roofs with a kitchen garden having vegetables and even some trees.
2. Arunachal type. Most tribal settlements follow the valleys and hilltops are avoided. Most traditional houses from east to west in Arunachal Pradesh were built and are even built today on stilts. The villages following the valleys occupy the mid-slope segment on either side of the river, the lower fluvial terraces being used for wet cultivation of rice, while the forest-covered upper slopes were used for *jhum*, shifting cultivation and grazing. The houses, except of the chief, were not big. The most typical case is that of an Apatani village, where small houses on both sides of the street are on stilts, approached by low stairs, an open platform in front and a toilet on the rear, where the pigs work as scavengers (Photo 14.8).
3. The eastern mountainous domain. The Nagas and Mizos, the Nagas particularly, have large villages located on the top of hills, a divide or ridge, arranged in row on two sides of the street. The traditional house used to be an elongated thatched

house with sloping thatched roof almost touching the ground. Some groups of Nagas like Angamis have more compact villages, divided into *khels* by very narrow lanes. Even the Mizos had their huts on the divides or open hillsides or tops.

References

Barman R (1984) Social landscape of Bojali. MPhil dissertation, Gauhati University

Dalton ET (1872) Descriptive ethnology of Bengal. Asiatic Society of Bengal Press, Calcutta (1973) Reprinted by Cosmo Publication, New Delhi

Kalita GC (2003) Changing socio-economic characteristics of Pathsala town. MPhil dissertation, Gauhati University

Nair K (1961) Blossoms in the dust: the human element in Indian development. Gerald Duckworth, London, pp 139–140

National Mapping and Thematic Organization (2001) District planning map of Barpeta (Assam). Government of India, Kolkata

Singh ND, Singh YN (2008) Evolution of settlements in Manipur valley. Trans Inst Indian Geogr 30:176

Chapter 15
Urbanisation and Urban Landscape in North-East India

Abstract North-East India is the least urbanised state of India with only 18 % of the region's population living in 414 towns of variable size. Guwahati, the capital of Assam, is the only million city in the region. Besides, there are half a dozen towns with a population of over 100,000. The largest number of towns falls in the group having a population of 5,000–10,000 people. Many of these towns have a statutory status as a town, without fulfilling either the conditions prescribed by the Census of India, and don't have an economic base to sustain a local self-body. The region, however, boasts of a past urban culture and many historic towns some of which exist only as ruins. Most towns are administrative or service centres, and only a few are industrial towns. A few industrial towns that exist in the region are in Assam in, or close to, industrial clusters. Among important towns, one may mention Guwahati, Dibrugarh, Silchar, Jorhat and Tezpur in Assam, Shillong and Tura in Meghalaya, Imphal in Manipur, Kohima and Dimapur in Nagaland, Aizawl in Mizoram, Tawang and Ziro in Arunachal Pradesh and Agartala in Tripura. Guwahati, earlier known as Gauhati, is the capital of Assam. Located on the left bank of Brahmaputra and on a bridgehead and having an international airport, it is the gateway to North-East India. Equally important is Shillong, the capital of Assam during the colonial regime for over 70 years and a hill station located at 1,500 m ASL. As the capital of Meghalaya, the town is the administrative and cultural seat of the state. Mention has to be made of Digboi, the oil town of Assam, with a petroleum refinery and several petro-based industries. Kohima, the capital of Nagaland, became famous after the 1944 battle when the Japanese forces were routed in the Battle of Kohima and forced to retreat. Agartala, in Tripura, is an upcoming capital city and so is the newly planned town of Itanagar, the capital of Arunachal Pradesh.

Cities are a symbol of civilisation. From the very early times, they have been the centres of power, important seats of learning, promoting art, science and culture and serving as nodal points in the administration of a territory. The emergence of mercantilism, during the medieval period, brought into existence trade centres at

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appropriate locations. With the advent of the industrial revolution, industrial cities made their appearance, followed by port towns, to promote international trade. Today, cities are more complex in their functions and serve not only as administrative headquarters but, equally important, as engines of economic growth, nerve centres of communication and the originators of major social and political movements. With such a wide-ranging role, cities have attracted large mass of population all over the world, and in developed countries, majority of the population lives and works in the cities.

In India as well as in the North-East region, the early cities were either the capitals of ruling dynasties or places of pilgrimage, occupying invariably some riverside locations. From Indraprastha of Mahabharat to Ayodhya to Kashi, Rajgriha, Ujjain and Pragjyotishpur of Assam, all were the seats of royalty and located on river banks. Besides the sanctity attached to some of these rivers, they were the lifeline of the region, providing fertile alluvial plains that sustained large population and served as waterways. The situation changed slightly during the medieval period with the arrival of Muslim rulers in India, who required garrison towns, forts and regional administrative centres for an effective control and administration of large territories.

The British, starting with their trading activities, established seaports that later emerged as very important element in the economic and urban landscape of the country. The role of their industrial and trading activities was very closely linked with the process of urbanisation in the country. The arrival of the railways in India during the latter half of the nineteenth century created a dense interregional network of transport that boosted the exploration of regional resources and further promoted urbanisation. The colonial rulers needed an effective administration for collection of revenue and a transport system that facilitated not only trade but could be utilised for rushing troops to suppress any revolt that might brew anywhere in the country. Their trading interests lay in marketing the imported finished materials in the large consumers' market and exporting raw materials, like cotton and jute, besides food grains, minerals, tea and other commodities through the ports. This led to the growth of a large number of well-connected tiny headquarters for a hierarchy of administrative units, like provinces, districts and tahsils. Besides the administrative centres, cantonment towns, hill stations, railway junctions and wholesale trade centres emerged in practically every province. Added to these were a few industrial towns, like Ahmedabad, Kanpur and Coimbatore.

The urban scene, a little over a decade after the British crown established its sovereignty over India, was represented in 1871 by 45 towns, each with a population of over 50,000, of which only 16 had a population of over 100,000, with no million city in the country. Calcutta was the largest town of British India with a population of 795,000 followed by Bombay, Madras and Lucknow, and the largest town in the territory, now in Pakistan, was Lahore with a population of 98,924. Dacca had a population of 67,212. Assam in 1872 had nine settlements classified as towns, the largest being Sylhet with a population of 16,846, and Tezpur, the smallest, which had a population of 1,877. In between were Gauhati with 11,492 people and Barpeta with 10,606 persons. Shillong had yet to attain the status of a town.

The contrast in the situations, between 1871, immediately after the British arrived, and 1951, immediately after the British left in 1947, is obvious. Assam in 1951 had 43 towns with at least one town, Gauhati with a population of over 90,000.

The picture of urbanisation in Assam accords well with that of India, and the sequence of evolution in North-East India is very similar to what is in the rest of India. In the urbanisation of Assam, the following phases can be deciphered:

1. Cities in early historic times
2. Cities during medieval period
3. Urbanisation following economic exploitation during the colonial period
4. Rapid urbanisation following economic development during post-independent period

15.1 The Early Historic Cities in Assam

The historical records of Assam for long synonymous with the North-East of India mention many cities that were once proud capitals of some ruling dynasty or the other. Many of these cities no longer exist, some are completely transformed and some appear in the immediate vicinity by some other names. The principal reason why these cities did not survive was the change in the strategic focus as new principalities emerged and as the circumstances promoting cities changed favouring alternative sites.

It has to be observed that these early cities were functionally different from the present generation of cities. They did not have to pass the test of fulfilling the criteria prescribed by census authorities. They possessed a degree of urbanism, in their authoritative role and cultural achievements. Being centres of royalty, these centres attracted intellectuals, accomplished litterateurs, diplomats, poets and skilled artisans. As economy, especially industry and trade, developed, the attention shifted to locations of towns better suited to industry, trade and effective administration.

Some of the early historic cities are briefly described below.

15.1.1 Pragjyotishpur

From all available evidence, both traditional based on literary epics and historical, the oldest city in the North-East was Pragjyotishpur, identified with modern Guwahati, the present-day capital of Assam and the gateway to the North-East region. Pragjyotishpur is mentioned in the famous epic *Ramayana* widely believed to have been written in the first century BC. The city is mentioned in the writings of Kalidas (Raghuvans, IV–83). The *Bhagwat Purana* written subsequently has spun a story around Pragjyotishpur associating it with Narakasura, the father of legendary Bhagadatta who is a Mahabharata hero, having participated in the epic war of Mahabharata.

Unassailable historical evidence is the Nidhampur Copper Plate (610 AD) of Bhaskarvarman whose capital was Pragjyotishpur. The city, therefore, dates back to at least seventh century AD and remained the capital of Varman dynasty for 300 years. Though its importance may have declined for some time, as some of the subsequent dynasties moved their capital west or northward for strategic reasons, Pragjyotishpur retained the status of an important city all through the history.

15.1.1.1 Dabaka

Another city associated with early history of the region is Dabaka, located in Kopili valley, in Nagaon district. The town still exists with its ruins on national highway No. 36, about 30 km south of Nagaon City.

15.1.1.2 Haruppeswara

Another capital city that was founded by a king of Salastambha dynasty in the eighth century A.D. is Haruppeswara, identified with modern Tezpur. Though in ruins in the vicinity of Tezpur, it was chosen by Hajjara, a Salastambha king, who was guided by strategic considerations. The kings of Pragjyotish, in the eighth and ninth century, perceived greater danger from the adjoining country of 'Gaud' in the west, and a location further east was considered safer. Haruppeswara by virtue of its location provided strategic depth against attacks from the west.

15.1.1.3 Kamtapur

The Pala kings established their capital at Kamtapur, a town still existing in Koch Bihar district about 40 km west of Dhubri. The shift from Pragjyotish to Kamtapur has to be seen on the background of the invasions by Mohammad I. Bakhtiar (1202), Giasuddin Iwaz–Khilji (1226) and Nasaruddin, son of Ilthumus, in 1228; all of them approached Kamarupa from the west. A change of capital in the western part of Assam occurred several times, like the one from Kamtapur to Jalpaiguri to Dimla, the last one in Rangpur district, within a period of 25 years between 1305 and 1325, while Pragjyotishpur was dominated by the Bhuyan chiefs.

15.1.1.4 Kanyaka (Pratappur) Near Viswanath

The tangled conflict between the successors of Kamtapur kings led to the split of the kingdom, and the eastern part was occupied by a king named Pralap Singh who established his capital in Pratappur near Viswanath.

During the period between thirteenth and fifteenth century, the centre of power shifted from Pragjyotishpur to Kamtapur. From Kamtapur the rulers dominated the

territory of North Bengal and controlled the entire Rangpur division as far as Ghoraghat. This also meant that during this period, Kamarupa was free from foreign invasion.

15.1.1.5 Sadiya

A town no longer in existence, as much of it was destroyed in the 1950 earthquake and washed away. It was the capital of the Chutia kings, even before the coming of the Ahoms in the early thirteenth century. Sadiya had a small fortress, but in addition, the brick fort of Itanagar was, in all probability, built by the Chutia chiefs.

15.2 The Capital Cities of Koch Kings, Kacharis and the Ahoms

15.2.1 Koch Bihar

The Koch dynasty founded by Viswa Singh in the beginning of the sixteenth century had its capital at Koch Bihar, now in West Bengal. One of the Koch kings Malla Deva, popularly known as Nar-Narayan, overran practically the entire North-East and forced the kings of Manipur, Jaintia and Kachari raja and the kings of Tipherah (Tripura) and Sylhet to accept the suzerainty of the Kochs.

Besides the city of Koch Bihar, the Koch kings are also credited with the building of the famous 560 km long road, known as Gohain Narayanpur in Lakhimpur district. Besides being a lifeline, the main transport route north of Brahmaputra, it also served as embankment, because of its elevated nature, that was effective in preventing low-level floods from spreading further north.

15.2.1.1 Barnagar

The division of the Koch kingdom between the two successors led one of them, Raghu Rai, who for a short time made his capital at Barnagar now in Barpeta district.

15.2.1.2 Hajo

Initially a temple town with Hayagriva–Madhava temple of eight century and several deities and worshipped by both Hindus and Buddhists, the town has seen the accretion of a number of religious edifices. During the rule of the Koch dynasty, another temple dedicated to Hayagriva was added. The temple was destroyed by Kalapahar, a Hindu apostate, in 1553, but subsequently restored by Raghu Rai, the king of the eastern part of Koch kingdom, in 1583.

Hajo was the capital of Koch Hajo kingdom in the late sixteenth century and later the headquarters of the Mughal garrison and remained one till around 1660. Another monument that became the object of veneration in the town is a mosque, built in the mid-thirteenth century by Yuzbeg Tughril Khan to commemorate his short-lived victory, as the Sultan was badly defeated and killed shortly afterward. Thus, Hajo, an ancient place of worship, suffered destruction and restoration several times, lying as it was on the west–east route running parallel to Brahmaputra from Koch Bihar eastward. Today, it is a place sacred to Buddhists, Hindus and Muslims, each praying in its own place of worship.

15.2.1.3 Parikshitnagar

Parikshitnagar (North Gauhati) was established by Parikshit, a Koch king in early seventeenth century. The fortifications of the city can still be traced for several kilometres.

15.2.1.4 Bijoynagar

Situated at the bank of Gadadhar river was the capital of eastern part of the Koch kingdom during the reign of Parikshit. The place has a relatively central position in the region between Manas and Barnadi, the territory of the eastern wing of the Koch kingdom.

15.2.2 The Capitals of Kacharis

15.2.2.1 Dimapur, Maibong and Khasghar

The Kacharis, a group allied to Boros, ruled part of upper Assam with their capital at Dimapur. They were driven away by the Ahoms. The ruins of Kacharis capital can still be seen at Dimapur. The Kacharis retreated before the onslaught of the Ahoms and established their capital at Maibong, in North Cachar Hills, to govern a much smaller territory. But always under threat from the Ahoms, they moved further south crossing the Barail range and established themselves at Khasghar in Cachar district.

15.2.3 The Capitals and Important Cities During the Rule of Ahoms

15.2.3.1 Charaideo, Gargaon (Ghargaon), Kaliabar

Ahoms entered the Brahmaputra valley in 1228 and established their capital at Charaideo, which was also their permanent capital. The expansion of the kingdom took place in the late fifteenth and early sixteenth century, when the capital was

shifted to Dhing, a town on the lower terrace of Brahmaputra, about 25 km north-west of Nagaon, for better administration of the expanded territory. By 1534, the Ahoms controlled the entire Brahmaputra plain extending west as far as Teesta river.

15.2.3.2 Kaliabar

This was made a provincial town during the reign of Pralap Singh, one of the Ahoms, and a Barbarua and a Barphukan, the former in charge of the general administration and the latter a general, were made in charge of the Ahom territory west of Kaliabar. One of the later Ahom kings, Rudra Singh built a new capital at Rangpur near Sibsagar.

The two important cities, Charaideo and Gargaon, both east of Sibsagar, with a number of palaces and other monuments like tanks and temples, suggest a stable rule of Ahoms lasting for six centuries. They also adopted Kaliabar as a regional capital and kept Gauhati always under control of some Bhuyan chief or a Barphukan, appointed for the administration of the western part of their kingdom, to face and absorb the onslaught from the west.

15.2.4 The Mughals and Their Contribution to Urbanisation

The Mughals were perhaps the first to establish a hierarchy of administrative areas in Assam. In the early seventeenth century when Kamrup was, for a short spell, under the Mughals, they introduced the concept of Sarkar, Pargana, Taluka and Mouza. Each of these revenue units had a headquarters with a potential to develop subsequently into a town. Most of the activities of streamlining the routes, establishing garrisons and temporary headquarters were confined to the western part of Assam. The area east of Gauhati lay under the effective control of Ahoms.

During the Ahom period, there were practically no monetary transactions. The coins during the Koch Bihar kings or the Ahoms were only symbolic and were not intensively in circulation in every household. Monetization of the economy took place only during the British period. Industries, like weaving of silk or making of jewellery, were cottage industries confined to large villages. Land rent during the Ahom period was paid through service, under a *paik* system introduced by the rulers. No one paid wages; the labour was either bonded or worked as *paik* in return for the land they tilled. Interregional movement was limited. Only annual fairs, either on river banks or on the duars to Bhutan or pilgrimage places with some deity, attracted periodic congregations. Commodity exchange was common; and warehousing and trading was minimal. Bhuyan chiefs, high-ranking officers like *Hazarika* and *Saikia,* were the ones that controlled both the administration and the subsistence economy.

To summarise, the towns forming the capital or headquarters of a dynasty, or a province, or functioning as regional centres, fort towns or garrison towns are given in Table 15.1 and Fig. 15.1.

Table 15.1 Cities of ancient and medieval Assam

Name of the cities	Location	A brief description of the city with dates
1. Pragjyotishpur	Coinciding with present Guwahati	The capital of the first known ruling dynasty, the Varmans, since the seventh century AD
2. Haruppeswara	Near Tezpur	Capital of the second king Harjaravarman of Salstambha dynasty
3. Kamtapur	40 km west of Dhubri	The capital of the kings calling themselves Kamteshwar. The capital was shifted to Kamtapur led by Sandhya, the ruler
4. Kanyaka	Near Viswanath about 20 km east of Tezpur	Developed by Pralap Singh in the late twelfth century. The town does not exist, and ruins are not easily recognised
5. Dimla	In Rangpur district in Bangladesh	The capital of King Dharmanarayan in early fourteenth century
6. Ghoraghat	In Rangpur district in Bangladesh	The capital of Tamradhvaj, the king of the western part of Kamrup–Kamata kingdom (1330)
7. Garia	Near Koch Bihar	The headquarter of Durlabhnarayan (1335), a king in western Assam
8. Sadiya	Town on the Brahmaputra where it enters Assam plain	Capital of Chutia rajas in the twelfth and thirteenth century
9. Barnagar	In Barpeta district	The headquarters of Raghu Rai, the founder of the eastern part of Koch kingdom early seventeenth century
10. Dimapur		Capital of Kacharis in the fourteenth century. Ruins, tanks and pillars in the vicinity of Dimapur
11. Koch Bihar	Present Koch Bihar, West Bengal	The capital founded by the Koch kings in the beginning of the sixteenth century
12. Parikshitnagar	Northern Guwahati, trans-Brahmaputra	Developed by Parikshit, one of the Koch kings on the northern bank of Brahmaputra opposite Guwahati
13. Hajo	20 km north-west of Hajo	A garrison, a temple town, a mosque town and a religious place for Buddhists, Hindus and Muslims. Was the headquarters and a Mughal garrison for some time and was alternatively in control of Koch kings, Sultans and Mughal kings
14. Maibong and Khaspur	Maibong in North Cachar Hills	This was the headquarters of the Kachari kings on the retreat from Dimapur under attack from the Ahoms, fourteenth and fifteenth century. In due course, they moved further south to Khaspur on the Madhura river in Cachar

(continued)

Table 15.1 (continued)

Name of the cities	Location	A brief description of the city with dates
15. Ahom capitals (a) Charaideo (b) Gargaon also (Ghargaon)	Both these are close to Sibsagar	There are many places associated with Ahoms during their long rule of 600 years. But, there is a cluster of monuments centred around Sibsagar with the remnants of their capital
(c) Kaliabar▶	On Brahmaputra north of Nagaon	

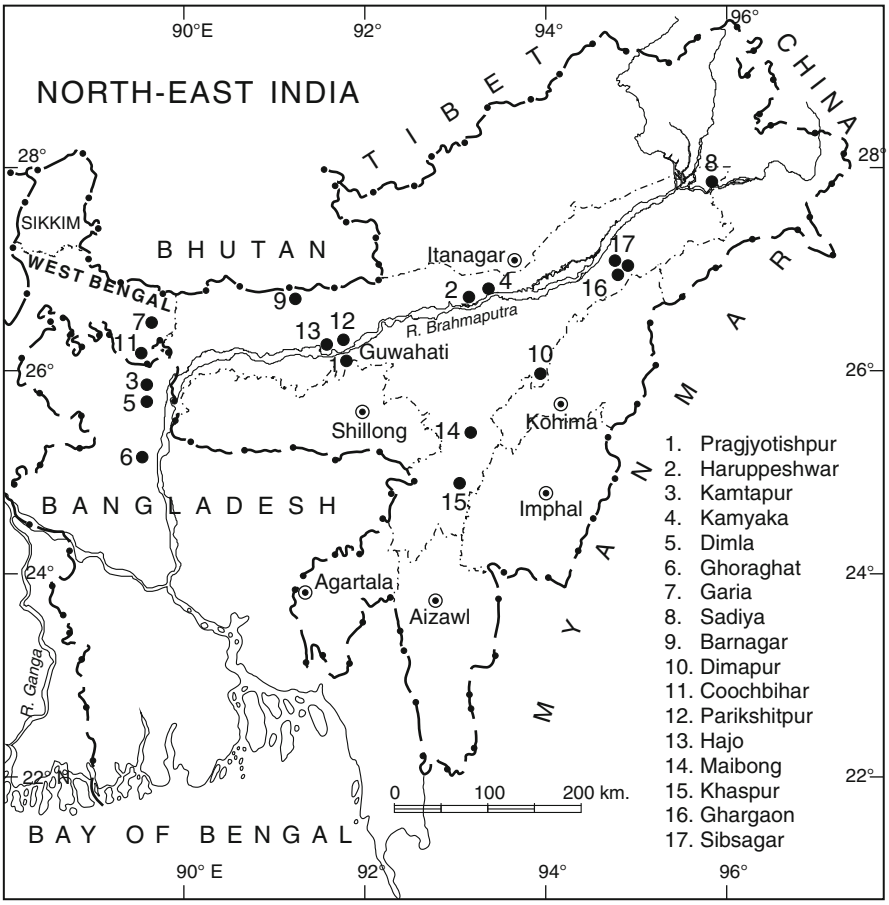

Fig. 15.1 Early towns or their ruins in North-East India

15.3 The Arrival of the British and the Emergence of a New Urban Landscape

The British dethroned the last of the Ahom kings, Purandar Singh, and annexed his entire territory by 1838, thus gaining control over entire Assam, though they had stepped into Assam as early as 1792 to help the Ahom kings suppress internal rebellion. The annexation of Assam in 1838 was only symbolic, as they had begun to exercise considerable authority over the state, even earlier.

The British, with an eye on resources of the region, began exploiting the land, the forests, the minerals, the agricultural potential and even the farmers of Assam, the moment they had complete authority over the region and suppressed all resistance. They surveyed the land; fixed village, taluka and district boundaries; fixed land revenue in monetary terms, realisable from the farmers; set up administration; and started laying roads and railways to transport the raw material of the region to be exported abroad. These measures had very adverse effects on the economic condition of the farmers who, used to paying in kind and labour, found it difficult to pay the rent and were reduced to penury. Even the well-to-do officer class of the Ahom times lost their power and had to adjust to the new system.

But another result was the emergence of a system of settlements where every thana, taluka or district, with its hierarchy of administrative set-up, started growing with a small market. As the railways arrived, every station provided a nucleus and a potential to grow into a small town. A railway junction like the one at Lumding automatically grew into a large settlement and finally into a town. The railway workshop like the one at Dibrugarh attracted a considerable workforce. The exploitation and transport of coal and the extraction of petroleum and its refining and transport, besides the development of tea estates in large number, required labour, and a concentration of labour force produced towns like Dibrugarh, Digboi, Tinsukia and Jorhat. The development of tea estates brought a good transport system, and the export of tea, petroleum and coal by railroad through the port of Chittagong and by small ships to Calcutta increased the economic activity of the region. Railways, tea, oil and coal with steamers plying in Brahmaputra with several ports of call all added to the impetus for the growth of towns. Construction of roads was another factor that encouraged the movement of goods and people and prospects of greater trade and the establishment of other service centres. Besides, fairs and weekly markets were encouraged, as these could boost the overall revenue of the government. Import of goods like salt, cotton piece goods, thread, grain, kerosene and oil to tea garden areas, to the oil fields of Digboi or the coalmines of Moran, created a flurry of activities that resulted in the development of towns like Dibrugarh, Tinsukia and Digboi.

15.3.1 Level of Urbanisation in the Late Nineteenth and Early Twentieth Century in North-East India

The earliest period for which some record of population for both villages and towns is available is the late nineteenth century, when the first approximate census was conducted for British India. In 1871, only two settlements, viz. Gauhati with a

Table 15.2 Number of towns in the North-East region in 1872, as declared by the government vis-à-vis those with a population of 5,000 and over

	Number of towns	
Year	With a population of over 5,000	Notified by the government
1872	2	8
1881	5	14
1891	7	14
1901	7	14

population of 11,492 and Barpeta with a population of 10,606, were the only ones in the entire North-East region qualified to be called towns if the present-day definition is applied. Yet, the Census Department with specific instructions from the Government of Assam included even smaller settlements like Tezpur, which were strategically important, in the category of towns, thus raising the number of towns to eight. The practice of notifying settlements, with a population of less than 5,000 as towns, continues even today (Table 15.2). The state governments have the option to notify and raise the status of a settlement from a village to a town.

As can be imagined, almost the entire North-East was rural and even the largest towns like Gauhati and Barpeta had a population of just over 10,000. Secondly, the narrow plain between the Himalayan foothills and Brahmaputra had hardly any place with a population over a thousand. The eastern cluster of settlements developed following the discovery of oil and coal and their extraction had not grown into towns. Assam proper, i.e. Brahmaputra valley, had only six districts, and the headquarters of each of these were notified to be a town. Thus Goalpara, Gauhati, Tezpur, Dibrugarh, and Nowgong were the six towns each coinciding with the headquarters of the district. Tezpur and Dibrugarh were the headquarters of Darrang and Lakhimpur districts. Besides these, Barpeta in Gauhati and Dhubri in Goalpara were also declared towns. Barpeta was, and is, even today, an important religious place having its association with *Mahapurushia sattra,* and Dhubri was a river port with a customs office and was considered important for interstate trade. Silchar and Sylhet were the only towns in Barak valley. The number slowly increased with the addition of more towns like Shillong and Kohima, despite their low population.

The level of urbanisation in the last quarter of the nineteenth century lingered between 1.4 and 2.95 % (Table 15.3). What one notices is a slow transformation of the region dotted with occasional towns.

15.3.2 Urbanisation and Urban Centres in the First Half of the Twentieth Century

The dawn of the twentieth century saw a new development in the industrial growth of Assam. Though oil was discovered and drilling had started in the fourth quarter of the nineteenth century, actual extraction and refining started in the beginning of the twentieth century. Digboi, Nahorkatiya and Moran with their production of oil and coal created an industrial landscape in the North-East corner of Assam.

Table 15.3 Towns and their population in Assam in the nineteenth century

Town	District	Population			
		1901	1891	1881	1872
Silchar	Cachar	9,256	7,523	6,567	4,925
Karimganj	Cachar	5,692	3,349	2,819	–
Dhubri	Goalpara	8,737	4,825	2,893	–
Gauhati	Kamrup	11,661	8,283	11,695	11,492
Barpeta	Kamrup	8,747	9,342	11,332	10,606
Tezpur	Darrang	5,947	4,011	2,910	1,877
Nowgong	Nowgong	4,430	4,815	4,248	3,241
Sibsagar	Sibsagar	5,712	5,249	4,583	3,993
Jorhat	Sibsagar	2,899	2,159	1,984	–
Golaghat	Sibsagar	2,359	2,211	2,141	–
Dibrugarh	Lakhimpur	11,227	9,876	7,153	2,774
Kohima	Naga Hills	3,093	1,781	1,380	–
Shillong	Khasi and Jaintia Hills	8,384	6,720	3,737	–
Imphal	Manipur	67,093	–	–	–
Total urban population		180,764	99,540	91,484	60,077
Total population		6,126,343	5,477,302	4,907,792	4,150,769
Percentage of urban population		2.95	1.80	1.86	1.44

Sources:
1. Census of India (1901)
2. In the overall population figure for 1872, 1881 and 1891 the population of Manipur is not added

The tea industry involving not only tea plantation but also tea processing and export also picked up in the early part of the twentieth century. The working of Makum and other coalfields also accelerated industrial activity. A river port was established at Dibrugarh that facilitated transport using Brahmaputra waterway. The Assam Railway Trading Company, together with the railway workshop developed at Dibrugarh, facilitated all kinds of economic development. This resulted in the development of an urban cluster in the North-Eastern part of Assam. Making Guwahati the seat of commissionerate and Shillong the capital of Assam province further attracted more people for administration, trade and a variety of other functions to urban centres. There was, nonetheless, no accelerated progress in the process of urbanisation. A few towns that were added had small population and did not make much impact on the level of urbanisation, though they increased the number of towns (Table 15.4). Till the 1960s of the last century, the North-East region of India had only three states, viz. Assam and the princely state of Tripura and Manipur, which after independence in 1947 were ceded to the Union of India as separate states.

In the first half of the twentieth century, the urban population of North-East India increased 4.8 times as compared to a 2.4 times increase in the total population of the region. Though the number of towns doubled, the impact was limited as most of the towns were district headquarters and a few that developed in the North-East region remained small with a limited skilled manpower.

Table 15.4 Number of towns and the percentage of urban population in Assam, Manipur and Tripura in the first half of the twentieth century (1901–1951)

	1901		1911		1921		1931		1941		1951	
States	No. of towns	% of urban population	No. of towns	% of urban population	No. of towns	% of urban population	No. of towns	% of urban population	No. of towns	% of urban population	No. of towns	% of urban population
Assam	14	2.35	16	2.43	24	2.76	25	3.01	27	3.28	28	4.58
Tripura	1	3.70	1	2.97	1	2.54	1	2.50	1	3.44	1	6.66
Manipur	1[a]	–	–	–	–	–	–	–	–	–	1	0.50
North-East region	16	2.24	17	2.28	25	2.57	26	2.80	28	3.10	30	4.48

Source: Census of India 1951, Towns classified by population since 1901, pp. 17–25

[a]Manipur in 1901 was mentioned as a town with a population of 67,093. In subsequent censuses, its status as a city was dropped, as it appeared an overgrown village. From 1911 to 1941, Manipur did not have, according to Indian Census, any town

Table 15.5 Towns of the North-East in different population size groups

	Year					
Population size group	1901	1911	1921	1931	1941	1951
50,000 to 100,000	–	–	–	–	–	1 (Shillong)
20 to 50,000	–	–	–	2	3	7
10 to 20,000	2	3	4	5	7	6
5 to 10,000	7	9	7	9	7	6
<5,000	8	5	14	10	11	10
Total	17	17	25	26	28	30

Source: Census of India (1951)

The focus of all political activity was Shillong, ever since it was made the capital of Assam in 1874, and even after independence, it remained the capital of Assam till 1972, the year when Meghalaya was made into a state. Located at high altitude with limited access, the city remained exclusively an administrative and educational centre and a summer resort for the rich of Eastern India. Resting in the salubrious climate of Shillong, the British ruled the province, supervising and administering the Barak and Brahmaputra valleys from the height of the plateau. Detached and unconcerned, except for law and order and the smooth flow of trade and exploitation of raw material, the city did not participate in the life of the people of the state. Thus, a number of small towns developed, but there was no massive impact, as development of industries, other than tea, coal and petroleum, was not intentionally promoted.

The largest town of the state was Shillong with a population of 53,756 in 1951. The population of both Shillong and Gauhati was around 30,000 in 1941; the transfer of power and the rush for being in the capital pushed the population of Shillong much ahead of Gauhati, which had a population of 43,615 in 1951.

During 50 years from 1901 to 1951, only 13 new towns were added to the existing 17 in 1901, bringing the total to 30. While in 1901 all towns had a population of less than 20,000, the situation did not change substantially in 1951, and 70 % of the towns still showed a population below 20,000. Shillong was the solitary town with a population over 50,000 in 1951 (Table 15.5).

Thus, of the 30 towns that existed in the North-East region, more than half had a population of less than 10,000 and one-third had a population of less than 5,000. Some of the largest cities with a population of over 20,000 in Assam in 1951 were Shillong (53,756), Gauhati (43,615), Dibrugarh (37,991), Silchar (34,059), Nowgong (28,257), Dhubri (22,787) and Barpeta (21,137). The last one was an important city in the nineteenth century next only to Gauhati, but it did not grow much, as besides being a place with an important *satra* (monastery), it did not have any of the advantages of a port city or proximity to mining or industrial area like Dibrugarh. It remained in the shadow of Gauhati that dominated the Brahmaputra plain.

15.4 Urbanisation After 1951

The period after 1951 coincided with a new chapter in the history of India as well as that of Assam. It marked the end of the colonial period in 1947 and the dawn of a new area of self-rule. The North-East region during this period saw unprecedented political activity, regime instability, reorganisation and the emergence of new states, viz. Nagaland, Mizoram, Meghalaya and Arunachal Pradesh. Besides the two princely states of Manipur and Tripura were ceded to the Indian Union and attained the status of full-fledged states after the reorganisation of the states in 1971. The reorganisation of the states that followed prolonged political turbulence and violent agitation produced states based on ethnic identity of different tribal groups. The discontent is still simmering in many parts of the North-East region where each ethnic group, sometimes confined to a very small area, agitates for an independent state.

The insurgency and the conflict between different ethnic groups and restricted access to outside agencies retarded the economic development as well as the smooth and efficient administration. Any development work – be it educational development, water conservation, power generation, laying of transport routes or bringing some innovation – was resisted and often damaged by insurgent groups. This generated a kind of indifference on the part of entrepreneurs, and even the government agencies found themselves handicapped treading cautiously. But, despite all the odds, the level of urbanisation in the North-East did rise substantially, though not quite comparable to the country as a whole (Table 15.6).

15.4.1 Growth of Urbanisation (1951–2011)

The number of towns in the North-East region (eight states including Sikkim) has increased more than eightfold from 30 in 1951 to 414 in 2011, and the percentage of urban population showed an increase of three and a half times (Fig. 15.2). This stands in sharp contrast to the situation in India as a whole where the number of towns has not even doubled during the last 60 years nor has the level of urbanisation, which increased from 17.3 % in 1951 to 31.2 % in 2011.

This unprecedented increase in the number of towns in the North-East region is largely attributed to a reorganisation of the administrative set-up. From three capital cities, one each for Assam, Tripura and Manipur, now the region has eight capitals, one for each state. Secondly, the number of districts has increased from 26 in 1951 to 86 in 2011, necessitating the establishment of district headquarters, which are usually given the status of a town. Besides, there has been a spurt in economic activities from the sleepy conditions of the colonial days. Coming up of more industrial units, like oil refineries, cement plants and pulp and paper and plywood factories, has led to the development of a number of industrial clusters prompting growth of towns by increasing the size of existing service centres. Development of educational institutions; improved transport facilities, like direct railway connectivity between

Table 15.6 Level of urbanisation in different states of North-East during the period 1951–2011 (expressed as percentage of urban population)

States	1. No. of towns 2. % of population	1951	1961	1971	1981	1991	2001	2011	Urban population as % of the urban population of the NE
Sikkim	1.	1	1	7	8	8	9	9	1.81
	2.	1.99	4.22	9.46	16.13	9.1	11.06	24.97	
Arunachal Pradesh	1.	–	–	4	6	10	17	27	3.74
	2.	–	–	3.40	6.55	12.70	20.75	22.67	
Nagaland	1.	1	3	3	7	9	9	26	6.85
	2.	1.93	5.18	9.95	15.50	17.20	17.20	28.97	
Manipur	1.	1	1	8	32	31	33	51	9.82
	2.	0.49	8.68	13.10	26.40	27.50	25.10	30.21	
Mizoram	1.	1	1	2	6	22	22	23	6.71
	2.	3.54	5.35	11.35	24.60	46.09	49.63	51.51	
Tripura	1.	1	6	6	10	18	23	42	11.48
	2.	6.60	9.00	10.43	10.98	15.30	17.00	26.18	
Meghalaya	1.	2	6	6	12	12	16	22	7.11
	2.	9.66	15.26	14.57	18.06	18.60	19.58	20.08	
Assam	1.	24	53	72	80	93	125	214	52.44
	2.	4.30	7.20	8.80	9.87	11.09	12.90	14.08	
North-East	1.	30	70	108	161	203	254	414	
	2.	4.45	7.56	9.42	11.80	13.82	15.66	18.3	
India total	1.	3,060	2,700	3,126	4,029	4,689	5,161	79,35	
	2.	17.30	17.80	20.00	23.30	25.70	27.81	31.16	

Source: General Population Tables (India, States & Union Territories) tables I-A to A-3, Statement no. 3, p. 29

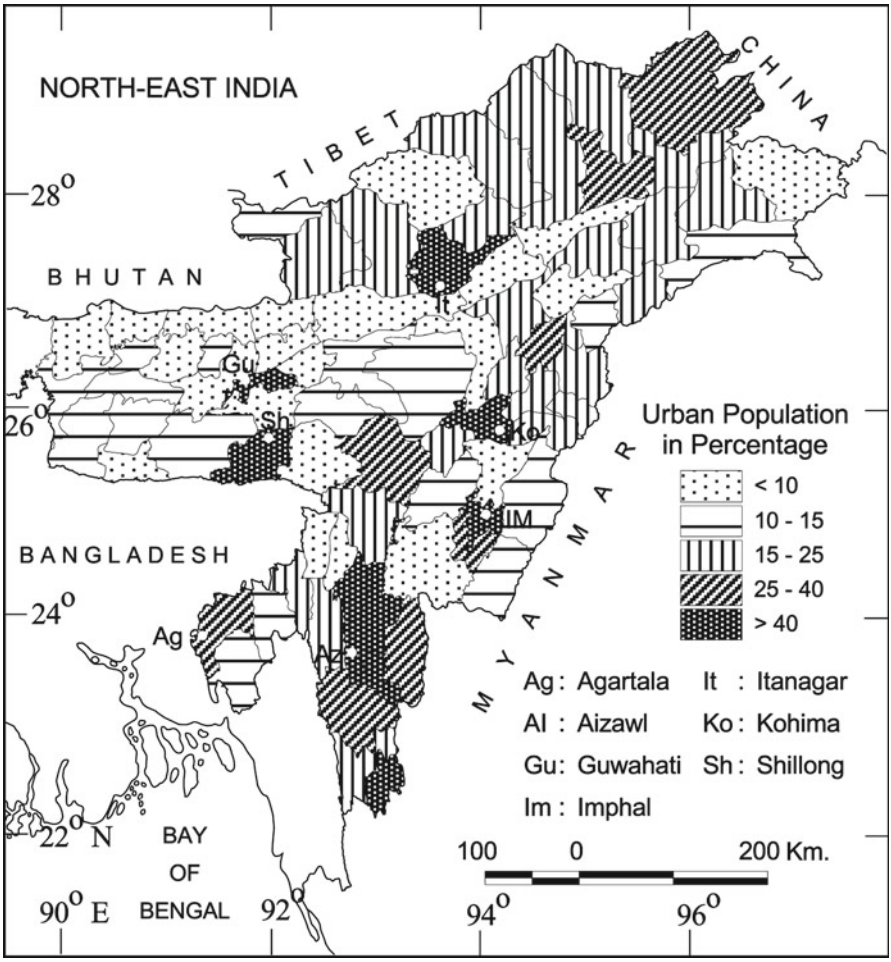

Fig. 15.2 Level of urbanisation in the states of North-East India – 2011 (percentage of urban population in each district)

the national capital Delhi and the extreme North-East corner of the region; establishment and activation of a number of airports; and a general tempo of development of the region have all combined to create new nuclei and brought many new settlements in the category of urban centres (Figs. 15.3 and 15.4).

The large number of towns in the region includes many tiny settlements with hardly any infrastructure, often without any local self-governing body and with considerable agricultural population (Table 15.7).

The North-East had no million city till 2001, the year of the last Indian Census. Guwahati, the largest town of the region, had a population of 818,809 in 2001. Even in 2011, the urban agglomeration of Guwahati did not reach a million mark and had

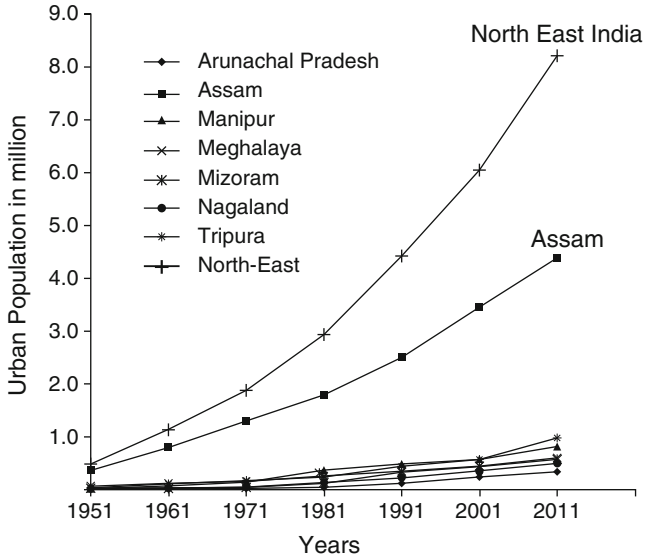

Fig. 15.3 Growth of urban population from 1951 to 2011 in the states of North-East India

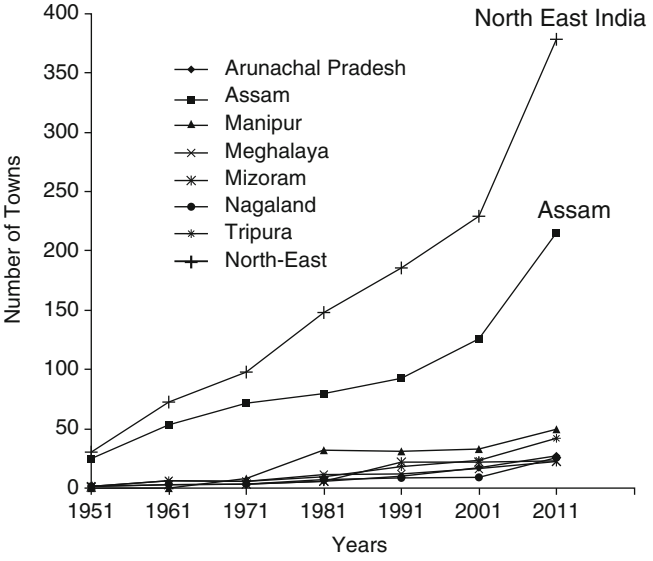

Fig. 15.4 Growth in the number of towns in the states of North-East India

a population of 968,594. Most of the cities with a population of over 100,000 are in Assam, with one each in Manipur, Nagaland, Mizoram, Tripura and Meghalaya, as given in Table 15.8.

Table 15.7 Towns in the North-East region in different population categories (population size of towns and class as defined by Indian Census (2001))

States	Over 100,000 I	50–100,000 II	20–50,000 III	10–20,000 IV	5–10,000 V	<5,000 VI	Total in 2001	Total no. of towns in 2011
Sikkim	–	–	1	1	1	6	9	9
Arunachal	–	–	3	6	7	1	17	27
Nagaland	–	2	4	3	–	–	9	26
Manipur	1	–	4	7	16	5	33	51
Mizoram	1	1	2	5	6	7	22	23
Tripura	1	–	6	9	7	–	23	42
Meghalaya	1	1	5	8	1	–	16	22
Assam	4	10	23	33	44	11	125	214
Total	8	14	48	72	82	30	254	414
Percentage of towns in the class	3.1	5.5	19.0	28.4	32.2	11.8	100	

Source: Census of India 2001, Series 1 – Urban agglomeration and towns, pp. 184–210

Table 15.8 Towns with a population of over 100,000, according to rank (2001 and 2011)

Rank 2011	Town	State	Population in 2001	Population in 2011	Growth in percent
1	Guwahati (UA)	Assam	818,809	968,594	+18.3
2	Imphal (UA)	Manipur	250,263	414,218	+65.5
3	Agartala (MCL)	Tripura	189,998	399,688	+47.5
4	Shillong (UA)	Meghalaya	287,662	354,325	+23.1
5	Aizawl (NT)	Mizoram	228,280	291,822	+27.8
6	Silchar (UA)	Assam	184,105	228,985	+24.3
7	Dibrugarh (UA)	Assam	137,661	154,019	+11.5
8	Jorhat (UA)	Assam	137,814	153,249	+11.3
9	Nagaon (UA)	Assam	123,265	147,137	+19.4
10	Tinsukia (UA)	Assam	108,123	125,637	+16.1
11	Dimapur	Nagaland	98,096	123,777	+26.1
12	Tezpur (UA)	Assam	105,377	100,477	−5.1
13	Itanagar (CT)	Arunachal Pradesh	35,022	Capital and largest town of Arunachal	
14	Gangtok (NTA)	Sikkim	29,354	Capital and largest town of Sikkim	

Source: Census of India 2011, Provisional population tables, pp. 5–13
Note: *UA* urban agglomeration, *NT* notified towns, *MCL* municipal council, *CT* census towns, *NTA* notified town area

The statistical distribution of towns is not normal and appears highly skewed in favour of small towns (Table 15.7). About 70 % of the towns of the region have a population of less than 20,000, of which 30 % do not have more than 10,000 people. More than 10 % of the towns have a population of less than 5,000, a qualifying

strength for a settlement to attain the status of a city. The median size of the towns is around 15,000, though the average population of city works out to about 24,000. Nagaland and Meghalaya have a more balanced distribution with a limited number of towns, which have grown over the years. Some other states have artificially propped up the number of towns by notifying them as towns or giving them the status of Nagar Panchayats to overcome deficiency in their non-agricultural population, which is required to be over 70 %. To quote some examples, none of the towns in Sikkim except Gangtok show all the characteristics required to be called a town. Besides Gangtok, there are only two more towns, Upper Tadong and Singlam, both in East Sikkim, which have a population of over 5,000. The remaining towns are deficient in all respects, but they are notified as towns. The phenomenon is not only confined to Sikkim. In Mizoram, all the cities from the smallest – the smallest being Beate, in Champhai district, with a population of 2,227 – to the largest are notified towns. More than one-third of the towns in Mizoram have a population of less than 5,000 (Fig. 15.5).

A notified town overcomes all the deficiencies and is based on the dictate of the State Government.

Another phenomenon in the new set-up of urban administration is that of Nagar Panchayats. These are large villages but are made statutory towns by giving them the status of Nagar Panchayats. In Manipur, out of 33 towns, 20 are administered by Nagar Panchayats. Panchayats have been hitherto a rural phenomenon, but their scope is enlarged and large villages are given statutory status of towns. The settlements classified as towns in Manipur, with a few exceptions, have a population of over 5,000, but their occupational character is largely agricultural. Based on population range categories, Assam has a statistical distribution tending toward normal, with a sizable number of towns in all groups. The increase in number appears natural, though addition at the tail end in the number of towns in the population range of 5,000–10,000 is more pronounced. A few towns having a population of less than 5,000 are either census towns or mining towns like Duliajan and Howraghat (Fig. 15.6).

The number of towns in Arunachal is relatively small. The state, with the largest area (83,743 km^2) among the states in the North-East, has only 17 towns, out of which 13 are district headquarters and the remaining four are Deomali (Tirap district), Jarampur (Changla district), Rocing (Dibang valley) and Namsai in Lohit district. All the four are located in the eastern part of the state. All four occupy important hubs of transport. Majority of the towns have a population of less than 20,000. There is no town in Arunachal Pradesh with a population of more than 40,000. Itanagar, with a population of 35,000 and the capital of Arunachal, is the largest town of the state. All the towns of Arunachal Pradesh are administrative, and most of them except of Itanagar, Tawang, Bomdila and Ziro appear like large villages, with large part of their areas occupied by administrative quarters and the population consisting of functionaries of the state or district government. Some, like Tawang with a Buddhist monastery and Ziro with the famous Apatani tribal group, have become tourist attractions (Photo 15.1).

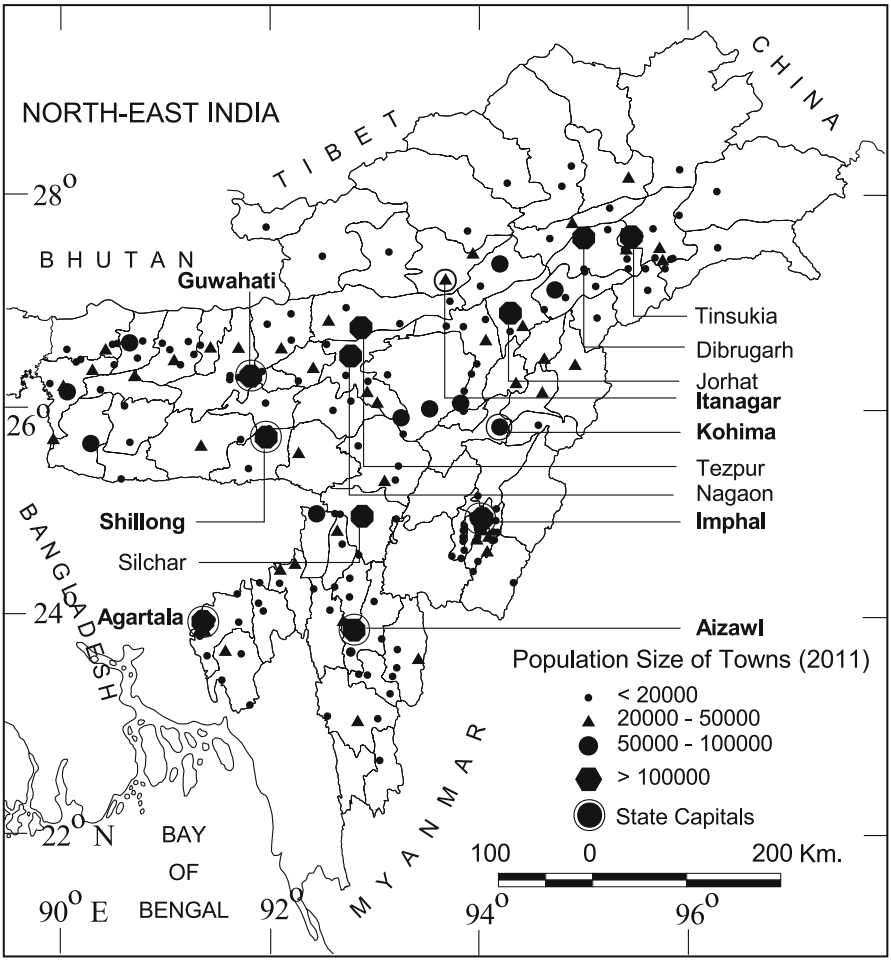

Fig. 15.5 Towns of North-East India in different population categories with a population of 20,000 or over (2011)

15.4.1.1 Arunachal Pradesh

Arunachal, the newly formed Himalayan and sub-Himalayan state in North-East India, with a population of little over a million, has over 22 % of its population living in towns. There are 27 towns in the state. Most of them are small, don't have much of urban infrastructure and are district administrative headquarters of districts. None of these towns has a population of over 100,000, and Itanagar, the capital and the largest town of the state, had a population of over 35,022 in 2001. Yet, there are some towns which are historically important and lie either on trade

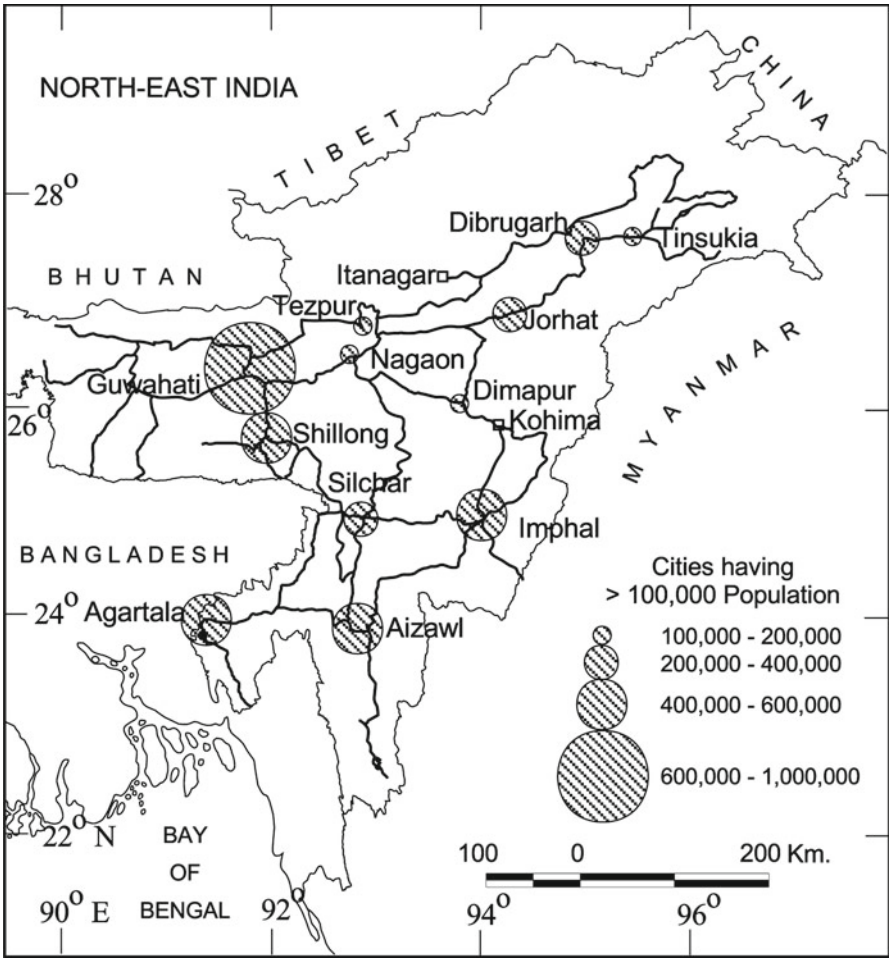

Fig. 15.6 Towns of North-East India with a population over 100,000 or over (2011)

routes or on the exit point of some rivers from the hills. Tawang, a monastery town and the birth place of the 6th Dalai Lama, located at a height of over 3,500 m, close to the Tibet border, in the western part of the state, has a population of approximately 10,000. The 400-year-old monastery, with 500 monks, nurtures the culture and tradition of Mahayana Buddhism (Photo 15.2). It has a nine metre high Buddha statue and many sacred Buddhist scriptures, including some gold-lettered ones. The town and the monastery serve as the focal point for Monpas who are Buddhists and draw their inspiration from the Buddhist shrine and the monastery. The town was overrun by the enemy forces during the Chinese invasion of 1962. For centuries, the Tibetan traders followed the trail from Tawang southward to Udalguri and Kariapar

Photo 15.1 The town of Tawang, 25 km south of Tibetan border; in the background is the medieval Buddhist monastery overlooking the town (Tawang district, West Arunachal Pradesh)

Photo 15.2 Tawang Buddhist monastery

in Assam during winters for exchange of goods. The town with an old Buddhist monastery and close to Tibet is a big draw for the tourists. The Monpas, living in the villages, in the hinterland of Tawang, are farmers growing barley and rearing yaks. Bomdila, another small town, about 70 km southwest of Tawang, on route to Tezpur, has a Buddhist seminary and a tourist centre. Ziro, the headquarters of Lower Subansiri district, is in the midst of Apatani territory, a tribal group with an old-age practice of irrigation for their paddy cultivation.

15.4.1.2 Itanagar

Itanagar, (population – 35,022 in 2001) the capital of Arunachal Pradesh, is a twin town, a lower one called Naharlagun and the upper one called Itanagar, which literally translated means the brick town, so named after an old brick fort built by the Chutia kings, in the vicinity. It houses the state secretariat and other administrative offices. Located barely 20 km north of Assam border on the southern slope of Siwalik ranges, Itanagar suffers frequently from landslides and resulting disruption of traffic. The town is accessible from the national highway no. 52, and the nearest airport, Lilabari, is 40 km away. In eastern Arunachal Pradesh, Pasighat, located at a point where Brahmaputra (Siang) exits from Arunachal Hills, is the eastern point of entry into Arunachal. Located in Brahmaputra bend where the river leaves the mountain, it is the site of a bridge on Brahmaputra to cross over to Dibang valley and other areas of east Arunachal Pradesh. There is also an air strip in the vicinity.

15.4.2 Present Level of Urbanisation and the Change During 2001–2011

The urban population of the North-East region of India incorporating the eight states is just over eight million (8.36 million) spread over 414 towns of different sizes ranging from a few thousand to a few hundred thousand. The largest town in the North-East is Guwahati urban agglomeration with a population of 968,549 in 2011. The overall level of urbanisation in the North-East is 18.3 %, with wide variations (Table 15.9). Mizoram with a total population of just over a million but with 51.5 % urban population and Assam, the largest state of the North-East with 14 % of urbanisation, present a contrast.

The inclusion of all the towns in Arunachal Pradesh as Census Towns till 2001, the presence of a large number of villages classed as towns as Nagar Panchayats and notifying many villages with a population of less than 5,000 as towns in Mizoram are already mentioned. Small populations of the districts in Arunachal Pradesh, including the population of the towns, usually the district or circle headquarters, do not warrant an additional administrative set-up for every town. Similarly, large agricultural settlements, though occupationally appearing as villages, require some

Table 15.9 Level of urbanisation and changes in the North-East region in 2001 and 2011, with number of towns in each state

States	Total population		Urban population		% of urban population to total population		No. of towns in the state	
	2001	2011	2001	2011	2001	2011	2001	2011
Arunachal	1,099,968	1,382,611	227,881	313,446	20.75	22.67	17	27
Nagaland	1,990,036	1,980,602	342,787	573,741	17.22	28.97	9	26
Manipur	2,166,788	2,271,756	575,968	822,132	26.58	33.94	33	51
Mizoram	888,573	1,091,014	441,006	561,997	49.60	51.51	22	23
Tripura	3,199,203	3,671,032	545,750	960,981	17.05	26.13	23	42
Meghalaya	2,318,822	2,964,007	454,111	595,036	19.58	20.06	16	22
Assam	26,655,528	31,169,272	3,439,240	4,388,756	12.90	14.08	125	214
Total North-East	38,857,769	45,587,982	6,086,613	8,367,815	15.60	18.3	254	414

Source: Census of India 2011, Provisional population tables, (1) No. of towns in 2001 and 2011, p. 40; (2) Rural and urban distribution of population and proportion of rural and urban population, Statement 1

governance apparatus, and as such large villages are classified as towns with Nagar Panchayats, a local self-body, similar to the municipality on a miniature scale.

More than half of the urban population of the entire North-East lives in the towns of Assam, though the state itself has a relatively low level of urbanisation. The unusually large level of urbanisation in Mizoram, Manipur and Arunachal Pradesh are explained earlier. In Mizoram, several settlements with a population of less than 5,000 have been notified as towns. In Manipur, large villages are taken as towns by introducing Nagar Panchayats, as a body of local self-government. In Arunachal, the small population of the state has witnessed the growth of district headquarters, which have raised the level of urban population.

15.4.3 State-Wise Evaluation of Urbanisation

It appears that the level of urbanisation, expressed by the percentage of people living in the towns, is devoid of merit in situations where the density of population is very low and where a few district headquarters, with some infrastructure and administrative offices and a larger population, present a picture of the district as if it is well urbanised. This is well illustrated in the case of Arunachal Pradesh where the East Kameng district, with an area of 4,134 km^2 and a population of 57,179, having population density of 13.83 persons to the km^2, has only one town, Seppa, the headquarters of the district with a population of 15,002. The level of urbanisation works out to over 26 %, whereas Assam with 214 towns has only 14 % of its population

Table 15.10 District-wise level of urbanisation in Mizoram 2001

District	Number of towns	Percentage of people living in towns
Mamit	3	17.46
Kolasib	4	54.55
Aizawl	4	76.07
Champhai	4	38.89
Serchip	3	48.15
Lunglei	3	42.34
Lawngtlai	00	–
Saiha	1	32.76

Sources:
1. Census of India 2001, series 1, Urban Agglomeration and Towns, pp. 190–191
2. Census of India 2001, Mizoram, General Population Tables for all districts

living in towns. Similar is the case of several hilly states and districts. In Assam, the North Cachar Hills district with the lowest population in the state and a population density of 38 persons to the km^2 has more than 31.6 % of its population living in four small towns. The district's high level of urbanisation is attributed to a low overall density.

15.4.3.1 Mizoram

Mizoram a state with a population of just over a million in 2011 has more than half of its population living in twenty-three towns, all of which are notified towns with no regards for the demographic, occupational or local self-government criteria (Table 15.10). Only five district headquarters, viz. Aizawl (291,822),[1] Kolasib (19,008) in the north, Champhai in the east (26,465), Serchip (17,006) in the centre, Lunglei (47,137) in the mid-south and Saiha (19,826) in the south, possess the requisite qualifying criteria (Photo 15.3). Though population of these towns, with the exception of Aizawl, is not large, these district headquarters with one or two notified towns raise the level of urbanisation of the districts with a low density of population. Despite this anomalous situation, where a higher percentage of population living in the towns appeared deceptive and meaningless, as illustrated in case of Arunachal, North Cachar Hills district of Assam and Mizoram, there is a comparability among the districts where the distribution and density of population is relatively high.

Aizawl, the capital of Mizoram, is the fifth largest town in the North-East region following Guwahati, Imphal, Agartala and Shillong with a population of 291,822, with a couple of other small towns in the district. Aizawl accounts for 52 % of the total urban population of the state and 76 % of the population of the district. This is an

[1] For cities with a population of over 100,000, the population figures refer to 2011; for the remaining towns 2001 figures are quoted.

Photo 15.3 A view of Aizawl, the capital of Mizoram with the cathedral at the western slope. Mizoram has 90 % Christian population

urban district with only one quarter of the population living in villages. Kolasib is another district with 54 % urban population. Thus, out of eight districts, two have more than 50 % urbanisation, two have about 40 %, another two have about 30 %, one has above 15 % and one has no town at all. The district of Lawngtlai has no urban centre, and the settlement of Lawngtlai may soon become a notified town.

It is ironical that a state with just over a million population of which two-thirds are engaged in agriculture, the level of urbanisation is so high, a scenario in which 27 % of the total population of the state lives in the main city Aizawl which also accommodates 52 % of the total urban population of the state. The dominance of Aizawl is obvious. It will be interesting to see the functional character of the town. Does it generate by its basic, i.e. export functions enough income that is in excess of the need of its population, or is the town just a capital city where enterprising people from the countryside have gravitated to share the amenities of urban life?

15.4.3.2 Manipur

Even with 33 % urbanisation as reported in 2011, three-fourths of Manipur territory, the mountainous north-east, north, north-west and west, lying in Ukhrul, Senapati, Tamenglong and Churachandpur district, is devoid of any city or any kind of urban centre. The culture of urbanism is confined to Imphal valley, the central plain

consisting of Imphal, Bishnupur, Thoubal and Chandel district. It has to be noted that as early as 1901, Imphal was classified as a town with a population of 67,093 including the cantonment population of 1,466, though it was observed that the town was an overgrown village.

Manipur, with an urbanisation level of 26.58 % in 2001, had 33 towns, all confined in the central plain of Imphal and lying in Imphal (West and East), Thoubal and Bishnupur districts. The situation has improved during the last decade (2001–2011). Eighteen more towns have been added as census towns, though these enjoy a statutory status, and the number of statutory towns remains 28 as in 2001. The number of towns in 2011 has gone up to 51 with a level of urbanisation of over 33 %. The valley has a cluster of towns within a radius of 40–60 km, drawing their sustenance from Imphal, the capital of the state, and the second largest town in the North-East region. Imphal urban agglomeration, the premier city of the state, has a population of 414,288 (2011) and accounts for more than 50 % of the total urban population of the state. Imphal, the core city, straddling the two adjacent districts, Imphal East and Imphal West, and governed by a municipal council, has a population of 264,986 (2011) and with six outgrowths, and two Nagar Panchayats make the larger urban agglomeration. Other important towns include Thoubal, Lilong and Kakching in Thoubal district, Mayang Imphal in Imphal district and Moreh on Burmese border in Chandel district. An intriguing fact is that some of the district headquarters like Ukhrul, Senapati and Tamenglong have not attained the status of statutory towns and are classified as census towns.

Many of the smaller towns, some with a population of less than 5,000 and others with a population of 20,000, are governed by Nagar Panchayats (urban tribunals). These so-called towns, huddled together in an agricultural area, are large villages depending essentially on their primary occupation, agriculture.

The bordering mountainous districts of the state, commanding large areas, have a very low density of population. Ukhrul, Senapati, Tamenglong and Churachandpur have a population density of 31, 87, 25 and 50 persons per km^2, respectively, and suffer from low agricultural productivity, based on shifting cultivation, and very poor accessibility.

Some kind of conflict has, of late, developed between the plainsmen of Imphal valley and the people living in the mountainous areas. This has further led to isolation of the hill people, who with an attitude of defiance manage their affairs including community governance, indifferent to the development measures initiated by the state government.

Imphal

Occupying a focal position in Manipur plain, Imphal is a beautiful city. Lying in the midst of the fertile valley, inhabited largely by Mheities, the Vaisnavite sect of Hinduism, the city, the present capital of the state, is a seat of culture centred around the famous Govindraj temple. For generations, it has been the royal seat of the rajas of Manipur and enjoyed their patronage. Though accessibility over land is confined

to the national highway no. 39 that connects the city with the rest of India and a poorly maintained national highway no. 53, air link is well maintained. Its broad tree-lined avenues speak of a former glory of the town. With stately building like the state secretariat and all other government offices, the city has a central street and a bazaar called 'Moreh market', named after the border town Moreh, where smuggled goods of all descriptions are sold. Besides, an extensive market trading largely in textiles, called *Khwairamband* managed exclusively by women, is a special feature of the town. Hardly 60–70 km from the Burmese border, Imphal has experienced adventurous attacks from Burma on several occasions in the past, and even during the Second World War, it witnessed the Japanese invasion and the advance of Japanese troops, though they were beaten back by the allied forces.

A town of historical importance, about 40 km south of Imphal, is Moirang, which was the last point of advance of Indian National Army, led by Netaji Subhash Chandra Bose, and where the Indian tricolour was hoisted during the Second World War.

15.4.3.3 Urban Centres in Nagaland

As seen earlier, till 1961, Kohima with a population of 7,246 (1961) was the only city in Nagaland. Nagaland till 1962 was only a district of Assam, known as Naga Hills district with Kohima as its headquarters. In 1961, two more towns, viz. Mokokchung and Dimapur, were added. Today it has 26 towns with a population of over 573,741 that makes 29 % of the total population of Nagaland. Today the state has 11 districts, and the headquarters of each district is a town. The only town that is not a headquarters is Chumukedima, a place close to Dimapur on the way to Kohima. Kohima, the capital of the state, is the second largest city; Dimapur (123,777 in 2011) is the largest city of the state. All other towns represented by their district headquarters have a population of less than 40,000, with the exception of Mokokchung which had a population of 31,214 in 2001. The most urbanised district is Dimapur with more than one-third of its population living in the two towns of Dimapur and Chumukedima. Kohima district has 23 % of its people living in Kohima itself. The urban population of the rest of the district is less than 10 % of the district's total population.

Nagaland is a hilly state with north–south ranges running parallel or semi-parallel to each other. As a district of Assam till 1961, there was hardly any development. Kohima, Wokha and Mokokchung, the three western districts of the state in a south–north alignment, were merely administrative headquarters with a deputy commissioner with skeletal administrative machinery and some troops. Many of the villages were larger than the district headquarters. The eastern half of the state though controlled was not governed by the state or district authorities. In such a situation, Dimapur located on the foot of Naga Hills, on Dhansiri river, with the advantage of railway link, was the obvious choice for warehousing goods and services. Dimapur as the commercial centre and Kohima as the administrative

headquarters became the two complementary cities that supported the administration and other services required for the region.

After the formation of Nagaland State in 1962–1963, the Nagaland territory was reorganised into a number of districts, each with a headquarters. Thus Mon, Tuensang, Mokokchung, Wokha, Zunheboto, Phek, Kohima and Dimapur emerged as ten towns in the state. Longleng in the north, Kiphire in the south, both resulting from the division of Tuensang district, and Peren were added as new districts and also district headquarters with the status of a town.

Dimapur

Dimapur, the largest town of Nagaland, is the gateway to hilly Nagaland. The town located at the foot of the Naga Hills, on the river Dhansiri, a tributary of Brahmaputra, controls the lifeline of Nagaland, as the national highway no. 39, the main artery that connects Nagaland with Assam on one the hand and Manipur on the other, passes through the city. With a well-maintained airport, it has direct flights to Kolkata, Guwahati and New Delhi, and being on the North-East Railway improves regional accessibility to the rest of India. Once the capital of Kachari kings, the city still has some ruins of the Kachari kingdom. During the British period, it was a place of storage and warehousing for the commercial needs of the Naga Hills district. During the Second World War, it was turned into a garrison town with supplies, stores and ammunition, from where the allied forces launched their counterattack and not only pushed back but defeated the Japanese forces. Since then, the city is also an important cantonment. The population of Dimapur has a large element of non-Nagas, essentially the traders who have settled here for several generations. The city has several educational institutions, Christian missions and cultural organisations that have promoted the cultural life of the city.

Kohima

Kohima, the second largest city after Dimapur and the capital of Nagaland, is located at a height of 1,400 m ASL, at a distance of 70 km from Dimapur. Surrounded by hills, with a clear view of the Japvo peak, the city occupies multiple levels. If Dimapur is the commercial centre of Nagaland, Kohima is the administrative and political nerve centre of the state. Kohima, with a population of 77,030 (2001), lies in the southwestern part of the state, a region largely inhabited by Angamis, one of the principal Naga tribes. The state secretariat and all the directorates, with educational institutions, several churches, hotels and road transport stations with the old Kohima village that adamantly refuses to merge its identity with Kohima town, are all located here. A very special landmark in Kohima is the Commonwealth War Cemetery commemorating the memories of the soldiers fallen during the Second War in the battle at Kohima. The city is famous for its annual Hornbill festival held during the month of December every year. About a decade ago, a central university

Photo 15.4 Kohima, the capital of Nagaland

was added to Nagaland with its administrative office in Kohima. Besides a number of schools and colleges, the town is rich in electronic and print media, publishing a number of newspapers like Nagaland Post, North-East Herald and some others including some in tribal languages, like Tenyidie, the language of Angamis, and Ao, the language of the Ao tribe. The town boasts of one of the good state museums in the North-East (Photo 15.4).

Though separated from each other by 70 km, Kohima, Dimapur and Chumukedima are closely interlinked and are interdependent. Strung along the same route, they supplement each other and often function as twin towns.

Two other important towns in the affairs of the state are Mokokchung and Wokha, both forming the headquarters of the districts of the same name. Mokokchung (31,214 in 2001), located in the Ao territory, is often referred to as the cultural capital of Nagaland. Known for several decisive conventions in Nagaland history, it is known for some of its leaders who launched significant movements. Not far away is the American Baptist Academy founded by Dr. Clark who entered Nagaland from Assam in the late nineteenth century and spread the gospel of Christianity among the headhunting tribes of the state. Presently Mokokchung houses the northern campus of Nagaland University. The place is accessible both from Kohima in the south and Mariani, a railway junction and Jorhat in Assam, by road.

Wokha, a city halfway between Kohima in the south and Mokokchung in the north, located on the same highway in Lotha territory, is known for its horticulture particularly oranges.

15.4.3.4 Agartala

Agartala, the capital of *Tripura*, with a population of around 400,000 (399,688 in 2011) is the largest town of the state. Located on the extreme western margin of the state, on the Indo-Bangladesh boundary, the town was the residence of the Raja of the princely state of Tripura in the beginning of the twentieth century. The town itself is not very old and was made the capital of the princely state in the mid-eighteenth century when the capital was shifted from Udaipur to old Agartala in 1830. Straddling across the river Haora, the old town grew on the left bank of the river and gradually spread to the right bank. Though a municipality was established in 1875, the town remained more like a village, inhabited largely by tribal folks, and had a population of 9,513 in 1901. The building of the royal palace 'Ujjayanta' in the beginning of the twentieth century provided the necessary impetus for the growth of Agartala, yet the growth was sluggish and attained a population of 54,878 in 1961. During the last 50 years, the population of Agartala has increased more than tenfold, largely because of huge influx of immigrant population from Bangladesh, after 1971. The town, besides being the capital of the state and having all the administrative offices, has a number of educational institutions, including a central university and a number of colleges. With its large Bengali Hindu population, it appears to be a cultural and educational clone of Kolkata and attracts large number of scholars and professionals from West Bengal. The town is connected with other parts of North-East India by road, a metre gauge railway line and by air. Agartala has, daily, several flights to Kolkata, Guwahati and other places in North-East India. The Indo-Bangladesh border, touching the limits of the city, attracts a large number of daily workers from the neighbouring villages of Bangladesh. Also, the nearest railway station, Akhaura, in Bangladesh, is just a few km away; travel to Bangladesh is easy. Now there is a daily bus service to Kolkata via Dhaka (Photo 15.5).

15.4.3.5 The Urban Landscape of Meghalaya

With 22 towns and an urban population of 595,036 (2011), Meghalaya has over 20 % of its population living in towns of different population groups. Most of the cities have a population of less than 20,000, a few have a population ranging from 20 to 50,000, and the only town with a population of over 100,000 is Shillong.

The most urbanised part of the state is the East Khasi Hills district with the largest town of the state. Shillong, an urban agglomeration, with the state capital Shillong, ten census towns in the immediate vicinity, like Mawlai and Nongthymmai, and a cantonment, accounts for almost 60 % of the total urban population of the state. In fact, there are only two towns on the plateau with a population over 50,000. The others are administrative headquarters and have not grown in the absence of a threshold population that could require and support a variety of non-rural functions. Shillong, the capital of the state, and Tura, the headquarters of West Garo Hills on the western part of Meghalaya plateau, are the only towns that attract any attention.

Photo 15.5 Agartala, Palace of the Maharaja of Tripura

Table 15.11 Variation in the number of towns and the urban population Meghalaya from 1901 to 2011

Year	Number of towns	Total urban population	Urban population as % of total population
1901	1	9,621	2.82
1911	1	13,639	3.46
1921	1	17,203	4.07
1931	2	26,536	5.52
1941	2	38,192	6.87
1951	2	58,512	9.66
1961	6	117,483	15.26
1971	6	147,170	14.50
1981	12	241,333	18.06
1991	12	330,047	18.60
2001	16	454,111	19.58
2011	22	595,036	20.06

Source: Census of India, General Population Tables (India, States and Union Territories) Tables A-1 to A-3, Statements 3 and 4, pp. 29–30; for 2011 the figures are taken from Census of India 2011, Provisional Population Totals, Statement 1

Till 1951 Meghalaya had only one city, i.e. Shillong with two independent governing units: Shillong Municipality and Shillong Cantonment. These two units were treated as two towns since 1931. The number of towns, total urban population and the percentage level of urbanisation of Meghalaya as it existed in the twentieth century are given in Table 15.11.

The 22 towns seen in 2011 are, strictly speaking, only eleven towns, as Shillong urban agglomeration includes ten census towns and one cantonment. The increase in the number of towns from 2 in 1951 to 6 in 1961, 12 in 1981 and 22 in 2011 is associated with the creation of new districts and subdivisions. From two districts, viz. United Khasi and Jaintia Hills district and Garo Hills district in 1951, the number of districts in Meghalaya has increased to seven today, and the prospects of some more districts being added to the list are always there. With the creation of East Garo Hills and West Khasi Hills in 1976, Williamnagar and Nongstoin were added in the category of towns, and creation of South Garo Hills district and Ri-Bhoi district in 1992 brought two more market centres Baghmara and Nongpoh in the urban system. Subsequently, Resubelpara in East Garo Hills and Cherrapunji (now Sohra) in East Khasi Hills were added to the last of towns. Yet, the latter is a census town without the state government having to notify it.

Meghalaya today has ten statutory towns, 1 urban agglomeration and 12 census towns. The small number of towns is as much a reflection of Shillong as a primate city as the result of slow economic development of the state. Even the existing towns are not well connected. There are only one or two good roads in the state, and the absence of feeder roads hampers local trade and intra- and interregional circulation of goods and people. The development of towns with diversified functions depends on the growth of secondary and tertiary functions, both of which have a very low level of development. The two main cities of the state, Shillong and Tura, have no direct air link and are connected in a tortuous way via Guwahati prolonging the distance, time and increase in transport cost. The existing cities don't have a strong economic base, and there is no visible growth of industries and trade to spawn new towns.

Much of the social, educational and cultural activities are concentrated in Shillong and Tura, and Cherrapunji is progressively becoming a tourist attraction.

Shillong

Shillong (population UA 354,325; M 143,007 in 2011),[2] the capital of the state and the headquarters of East Khasi district, is not only the largest but also the most important city of the North-East region, a showpiece of Meghalaya (Fig. 15.7). It has around 60 % of the total urban population of the state, over 40 % of the population of East Khasi Hills district and about 12 % of the total population of Meghalaya (Photo 15.6).

The town grew from a small village to its present important position within a span of 130 years. After the British annexation of the states of the Khasi chiefs, the Garo Hills and the kingdom of Jaintia *raja*, the headquarters of the company was set

[2] Note: UA – Urban Agglomeration, M – Municipal Board. Shillong UA consists of (1) Shillong Cantonment, (2) Shillong Municipal Board and ten census towns, viz. (1) Mawlai, (2) Pynthorumkhrah, (3) Nongmynsong, (4) Mawpat, (5) Umpling, (6) Nongthymmai, (7) Madanrting, (8) Nongkseh, (9) Umlyngka, (10) Lowsohtun.

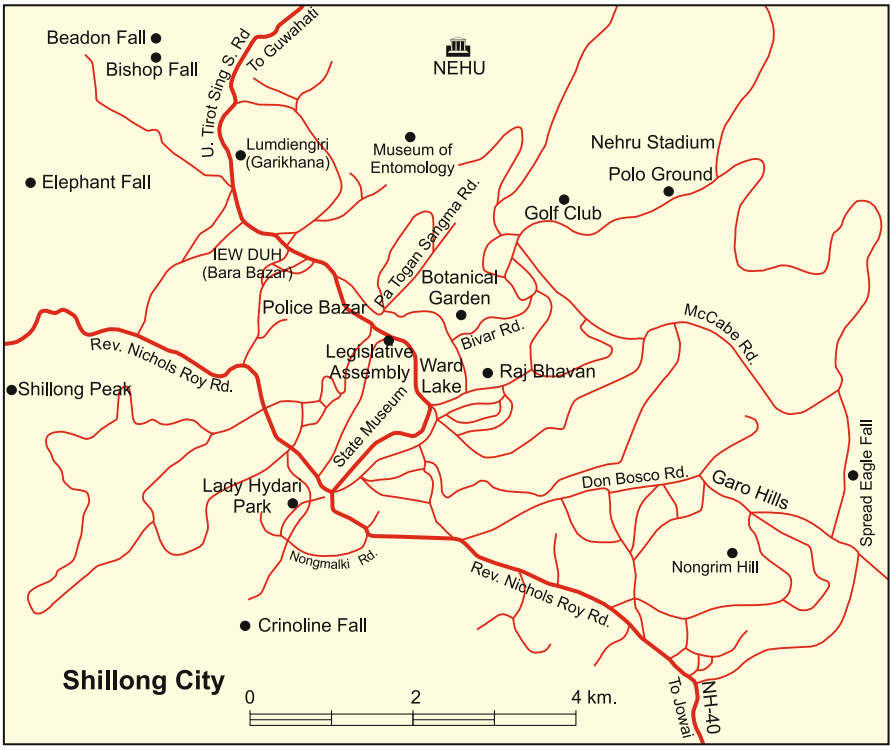

Fig. 15.7 The city of Shillong, the capital of Meghalaya (Adapted from a Guide Map of Shillong, Survey of India, Government of India)

up at Cherrapunji, overlooking the Sylhet plain which was already in the possession of the British. As the territory of the East India Company extended, the headquarters were shifted from Cherrapunji to Shillong in 1864. This was a median location, equidistant between the Brahmaputra and Surma valleys. With further annexation of Brahmaputra valley and the formation of Assam state, Shillong was declared the capital of the Assam state in 1874. The city occupied this prestigious position till 1972, for about 100 years, when Meghalaya attained full statehood and Shillong became its capital, and the capital of Assam was shifted to Guwahati.

Located at a height of 1,500 m ASL on the backdrop of the Shillong peak (1,965 m) that protects the city from the gusty winds from south, the place has a salubrious climate. With its rolling downs, the un-dissected plateau provided good sporting ground for riding, golf and polo to the colonial rulers, unlike the hill stations of the Himalayas. More importantly, its commanding height and steep approach from either side, north and south, provided it some element of strategic security, offering it at the same time the advantage to rush down to any part of the state at a short notice, because of its central location. The highest point of the city was

Photo 15.6 Shillong club established in 1878 by the British ruler when Shillong was the capital of Assam

occupied by the governor of the state, with the state secretariat, and the famous Shillong club that formed the venue for the rendezvous of the Europeans in the immediate vicinity. The city also formed the nucleus for the Welsh Presbyterian Mission who ran a hospital and propagated Christianity among the inhabitants of the region, the Khasis. A number of educational institutions like St. Edmund College, St. Anthony College and St. Mary College, developed by the missionaries, are even today an important element of the town's educational landscape.

The city has undergone a great deal of change during the last 50 years. Besides an enormous increase in population from 53,756 in 1951 to 354,325 in 2011, absorbing a number of smaller towns in its fold as an urban agglomeration, it has vastly enlarged its functional base. It is the home of the North-East Council, an arm of the Ministry of Home Affairs, Government of India, that was established 1972 to promote development in all the states of the North-East region. The city has a central university, originally meant for the North-Eastern hilly states, an All India Institute of Medical Sciences, a Central Management Institute, besides a number of research institutes. It has been since long the main office of the eastern zone of the Geological Survey of India, Survey of India and Anthropological Survey of India, besides the recently established North-East Research Centre of the Indian Council of Agricultural Research at Barapani, not far from Shillong.

The administrative buildings occupy the central part of the town, which is also the highest. On its north is the shopping street known as Police Bazar where most shops are owned by traders from other parts of India: The southern part extending till the

foot of Shillong Peak is residential-cum-shopping extension of the town. The central part is surrounded by educational institutions and other government offices like banks, district level offices, office of the North-East Council and a couple of hospitals. An important landmark in the town is the North-Eastern Hill University which has a splendid location in the midst of pine woods in Mawlai in the North-Eastern suburb, and the western suburb of the city represents the extended zone of the town.

Only 80 km south of Guwahati, the principal airport of the North-East, and well connected with other towns like Cherrapunji in the south, Jowai in the east and Nongstoin on the west, Shillong, located on Meghalaya plateau, is a transit point that connects the Brahmaputra valley in the north and the Barak valley in the south. The principal north–south artery of the region radiating from Guwahati as highway no. 40 passes through Shillong and descends to Silchar on Barak valley via Jowai as highway no. 44. With the pleasant climate in non-rainy months, as few scenic spots in the vicinity like Elephant Falls, Umiam Lake and Shillong peak, the town attracts a lot of tourists during winter. A botanical garden and Lady Hydari Park, named after the wife of Sir Hydari, the governor of Assam, are other added attraction of Shillong.

With considerable financial support of the Central Government, Shillong is turning into a showpiece of the North-East and an important cultural and educational centre for the tribal population of North-East India.

Tura

Situated in the midst of the Garo territory, at a height of 370 m ASL, in the western part of Meghalaya, Tura is the second largest town of the state after Shillong. The town with a population of less than 100,000 (58,978 in 2001) is the headquarters of the West Garo Hill district. Shrouded in greenery and surrounded by horticultural gardens, the town is indeed the ‘Green City of Meghalaya’. Though not a counterweight to Shillong, Tura, in the western part of Meghalaya plateau, has immense potential for development. At a road distance of 170 km from Guwahati, the town remains an unpreferred place. This disadvantage could be overcome by developing an airport near Mankachar, a small town 40 km to the west, on a relatively flat terrain. This would improve accessibility not only to Tura but to many other areas in western Meghalaya, by establishing a road link between Tura and Nongstoin in the centre of the plateau.

With improved accessibility, Tura will attract many other economic activities and will bring it closer to other parts of India.

Cherrapunji

Lying at an altitude of 1331 m, the town overlooks the Bangladesh plain, separated from Meghalaya plateau by the fault scarp of Dauki fault. Also known as Sohra among the Khasis and usually known for its very high monsoon rains, Cherrapunji has, in fact, some beautiful gorges, falls and caves in its neighbourhood and is becoming a tourists’ paradise. The town was the headquarters of the East India Company in this

part of the country and the first agent of the company, David Scott, after annexing the Khasi states, subdividing the Garos and dethroning the Jaintia raja, administered the territory from Cherrapunji till 1864. The earliest Welsh mission was started here, and David Scott died at this place.

A cement factory in the vicinity, utilising the locally available limestone, is an unusual sight.

15.5 The Contemporary Urban Scene in Assam

Judged from the percentage of people living in the cities, Assam is the least urbanised state of the North-East. Paradoxical though it might appear, it is true. The state has 214 cities, with 4.38 million people living in the cities that account for 14.8 % of the total population of the state.

15.5.1 Evolution of Assam's Urban Landscape

For centuries, Assam has remained rural, depending largely on primary occupations like farming, fishing, hunting and forestry. The settlements having a semblance of a contemporary town were either the seats of royal places or religious congregations, provincial headquarters or those having periodic markets or fairs. Even today, Assam lags behind the rest of the country in the level of urbanisation, with barely 14 % of its population living in the towns. After the advent of the British in India, the urban scene changed in Assam as in the rest of the country. Definite criteria were fixed for classifying a settlement as urban. In the beginning of the twentieth century, Census of India defined a town as an 'urban area with some sort of municipal government – such as municipalities, unions, or stations – cantonments, and certain selected areas of an urban character which are not administered under any municipal law'. Under this definition Assam (as it exists today) had 8 towns in 1872 and 12 towns in 1881 without any increase till 1921 when nine more settlements were classified as towns, bringing the number to 21 in the beginning of the twentieth century. Today, Assam has 214 towns including 7 urban agglomerations.[3]

The earliest seats of power in Assam were Gauhati, for long the imperial capital of several Hindu dynasties, and Sibsagar, the capital of the Ahom kings since the thirteenth century. Other important capitals like Kamtapur and Koch Bihar are no longer in Assam. Gauhati combined all the urban functions of a pre-industrial city with all the advantages of its location on Brahmaputra river. Besides being a capital and periodically a provincial seat, it was a very important place of pilgrimage for Hindus.

[3] Of the ten urban agglomerations in 2001, Udalguri, Bongaigaon and Lumding are taken off from the list in 2011.

Sibsagar, on the other hand, remained for centuries the seat of the Ahom power, with periodic shifts when threatened with an invading foe in its neighbourhood. Besides these two places, the only other place of prominence was Barpeta, a religious town with a *satra* (monastery) founded by Madhab, a disciple of Sankardeb, a fourteenth century saint–poet. This *satra* became a focal point of Hindu religious congregations in lower Assam, and with Sarthebari, being the centre of traditional bell metal industry, Barpeta rivalled Gauhati in importance. Thus, there were in all eight settlements in Assam classified by the Census of India as towns in 1881. Of these eight, only two, viz. Gauhati and Barpeta, had a population over 5,000. The remaining six were above average rural settlements, adopted by the British administration as district headquarters, and classed as towns.

15.5.1.1 Phases of Urbanisation in Assam

The processes of urbanisation in Assam and, in fact, the entire North-East can be examined in three phases:

1. The pre-British phase
2. The colonial phase of British occupation
3. Postcolonial or post-1950 phase – one may also call it the modern phase

The Pre-British Phase

This historical period spanning over several centuries, but more specifically embracing the Ahom, the Kachari and the Koch rule, was essentially a phase of rural economy. There was no planned effort to develop industry, trade centres and markets. The native handicraft industries, often in the form of cottage industries, were allowed to develop and function depending on regional requirement. Cottage industries like cotton textiles, silk production, pottery, mat making, manufacture of bell metal utensils, smithy and carpentry were the main industry-related occupations besides oil pressing, production of lac and lumbering. Some of these industries were more specialised and located at few places which became known for specific manufacture, like brass and bell metal industry though widely scattered became concentrated at Sarthebari in Barpeta district or Hajo and Titabar and Raha in Jorhat district. Specialised work of smithy was executed by expert smiths located largely at Karanga in Sibsagar district. Rearing silkworm was a specialised job perfected by the community of Rabhas in Goalpara district. All these were family enterprises and did not require either a very large clientele, a marketing strategy, or a centre with banking and finance. They were sold and exchanged in the village or weekly markets or periodic fairs. Sualkuchi, a silk-weaving and embroidery town, 25 km west of Guwahati, could also be included in this category.

There were hardly any towns, except the capitals or provincial administrative headquarters, which produced a semblance of a town.

The economy was subsistence and essentially rural, and despite the *coinage* system, symbolically adopted by some Ahom kings, particularly at the time of their coronation, large payments between the chiefs and rulers were through gold, elephants and foot soldiers. The Koch and the Kacharis also had their coins, but all these were symbolic.

Whatever sale or exchange was needed was transacted either in the weekly markets or annual fairs. Annual fairs, often associated with some religious festivals like Shivratri and Diwali, were held – and some still continue – in every district. Some of these fairs lasted for weeks offering enough scope for sale or purchase of goods, thus avoiding the transactional need of trade in the form of warehouses, agencies, wholesalers, etc.

Thus, besides Sadiya, the headquarters of Chutia kings; Sibsagar, the capital of Ahoms; and Gauhati, the headquarters of the western half of the Ahom empire under a Barphukan, Bijni and Barpeta, there were hardly any settlements carrying the semblance of a city. Some of the large settlements in the centre of the territory occupied by Bhuyan chiefs had some concentration of cottage industries and shops.

Another kind of important settlements were the river site locations at points where the channel of Brahmaputra is constricted, like Pasighat (now in Arunachal), Silghat, Saraighat and Ghoraghat (now in Bangladesh). These locations facilitated easy crossing of Brahmaputra and were sites of large settlements. Some settlements, in the Himalayan piedmont zone attained a size larger than the ordinary villages, but could not be termed towns. Some of these piedmont settlements like Darranga and Kariapar Duar witnessed month-long fair where exchange and sale of goods between the plain's people and the Bhutias or the Tibetans took place.

The Colonial Period

The arrival of the British in the North-East ushered not only in a new administrative set-up of the state but also a change in its economy. For once, the abolition of *paik* system of the Ahoms resulted in a revenue system where land revenue was to be paid in cash instead through labour. The peasantry was taxed and the economy was gradually monetised. Assam was divided into districts, each with an administrative headquarters (Table 15.12). The area covered by present Assam had seven districts, and the headquarters of each of these districts assumed the status of a town.

As can be seen, each of the seven districts was marked by at least one town that was its administrative headquarters. Only 2–3 % of the people of Assam lived in these eight towns. Gauhati, undoubtedly, was prominent because of its historical antecedents owing also much to its religious character, ascribed to Goddess Kamakhya. The other noticeable town was Barpeta, known because of its religious importance, being the place of a *satra* (monastery) founded by Sankardeb at the close of fifteenth century. Also, it was a trade centre, and the merchants of Barpeta were known for their skill in internal trade and they reached as far as Sibsagar district in upper Assam.

No town in Assam at the beginning of last century had a population of over 12,000. Gauhati and Barpeta had a population of 11,661 and 8,747 respectively.

As can be seen (Table 15.13), there was not much change either in the level of urbanisation or in the number of towns in the first half of the twentieth century.

Table 15.12 Towns in the area occupied by present-day Assam in the last quarter of the nineteenth century

District	Name of the town	1872	1881	1891	1901
Cachar	Silchar	4,925	6,567	7,523	9,256
Sylhet[a]	Karimganj	–	2,819	3,349	5,692
Goalpara	Goalpara	4,323	6,697	5,440	6,287
Goalpara	Dhubri	–	2,893	4,825	3,737
Kamrup	Gauhati	11,492	11,695	8,283	11,661
Kamrup	Barpeta	10,492	11,332	9,342	8,747
Darrang	Tezpur	1,877	2,910	4,011	5,047
Nowgong	Nowgong	3,341	4,248	4,815	4,430
Sibsagar	Sibsagar	3,993	4,583	5,249	5,712
Sibsagar	Jorhat	–	1,984	2,159	2,899
Sibsagar	Golaghat	2,141	2,149	2,211	2,359
Lakhimpur	Dibrugarh	2,774	7,153	9,876	11,227
No. of towns in Assam		9	12	12	12
Total population of the province		2,201,794	2,565,861	2,862,964	3,289.680
Urban population of Assam		45,372	65,030	67,083	77,054
Percentage of urban population		2.06	2.53	2.34	2.34

Sources:
1. Census of India, Assam, 1881, pt. II, page 23
2. Census of Assam, 1891, pt. II, tables, page 58
3. Census of India 1901, vol. IV Assam pt. II tables, p. 4

Note: Only the administrative area of present-day Assam is taken into consideration

[a]Other towns of Sylhet district like Sylhet, Habiganj, Sunamganj and Malvi bazar

Table 15.13 Urbanisation and growth of towns in Assam (the present-day area) in the first half of the twentieth century

				No. of towns in different population range						
Year	Total population in Assam	Urban population in Assam	% of urban population	<5,000	5–10,000	10–20,000	20–50,000	50–100,000	>100,000	Total no. of towns
1901	3,289,680	77,074	2.34	4	7	1	–	–	–	12
1911	3,848,617	92,916	2.41	3	8	3	–	–	–	14
1921	4,636,980	127,107	2.74	12	6	4	–	–	–	22
1931	5,560,371	162,166	2.92	9	7	6	2	–	–	24
1941	6,694,790	208,967	3.10	9	6	7	2	–	–	24
1951	8,028,856	344,834	4.29	7	4	7	6	–	–	24

Source: Towns classified by population with variations since 1901, table A-IV; Census of India (1951)

A dozen of towns were added to the existing 12 in 1901, to either make additional administrative subdivision in a large district or because of industrial development in the North-East of the state or the coming of the Bengal–Assam Frontier railways.

Towns like Hailakandi in Cachar district, Gauripur in Goalpara district, Palasbari and Nalbari in Kamrup and Mangaldai in Darrang district were notified as towns

though with a miniscule population to share the burden of revenue administration in respective districts. Palasbari and Nalbari in Kamrup district had a population of 2,733 (1921) and 3,518 (1941) respectively. Palasbari, now a suburb of Guwahati, was then treated a separate town: Mangaldai, now the headquarters of Darrang, was then a subdivision of Darrang with Tezpur as the headquarters.

The districts of Assam till the time of independence were relatively large sometimes with an area of more than 10,000 km^2. The Brahmaputra valley, originally divided into six districts, is now occupied by 22 districts. An additional administrative centre was meant to better administer the area.

Lumding, a railway junction, was declared a town in 1921, after the trade from North-East Assam picked up, and the town grew fast attaining a population of over 15,000 in 1951. In 1921, the setting up of Frontier Administration resulted in making Sadiya a town, as a control point of Sadiya Frontier. The development of Bengal–Assam Frontier railway, while promoting trade, did not cause a sudden spurt in urbanisation. There developed a few new towns like Doom Dooma, Tinsukia and Nazira essentially because of the development in North-East Assam. Doom Dooma, an important tea centre, and Tinsukia and Nazira, both in the midst of coal- and oilfields, were notified towns in Lakhimpur district.

Why the Development of Railways and the Tea, Oil and Coal Industry Had Minimal Impact on Urbanisation in Assam? – On all accounts, urbanisation in Assam, particularly in its North-Eastern region, did not proceed at a fast rate. The answer lies in the policy of the colonial government. After the discovery of tea plant in Assam in 1826, and its commercial production soon after, the discovery and exploitation of petroleum in 1880s and the beginning of exploitation of coal from Makum field, there should have been the emergence of a range of industrial activities and the consequent growth of towns, but it did not happen.

The interest of the British Government lay not in developing the economy of the region or the state but in exploiting these resources and make as much profit as possible. Secondly, whatever little development took place, the benefits did not flow to the local populace. Tea gardens managed by British tea planters did not even establish a tea trading centre, and a tea auction centre was developed at Calcutta. A number of chemical industries could have been developed to process the by-products of petroleum as is being done today. Small steel plants could have been promoted with local coal and iron brought from other parts of India. None of these happened. Tea, coal and oil were funnelled and sent across to Europe or other parts of India either by Bengal–Assam railway, which ran from Margherita in Upper Assam to Chittagong port, or by steamer. Dibrugarh, developed as a river port, was meant to export raw materials of this region down Brahmaputra by steamers. The policy was exploit, export and multiply profits; local and regional development was secondary. The coming of railways witnessed an increasing export of tea, coal, petroleum and timber and not a multiplication and growth of towns.

The only impact that could be witnessed was the growth of Dibrugarh as a river port, and with a population of 38,000, it became the second largest town in Assam in 1951.

Table 15.14 Population increase of a few Assam towns following 1947 division of India

Towns	Population in 1931	Population in 1941	Population in 1951	Decade increase in %	
				1931–1941	1941–1951
Gauhati	21,797	29,598	43,615	35.70	47.35
Silchar	13,069	16,601	34,059	27.02	105.16
Nowgong	10,413	12,972	28,252	24.50	117.70
Dhubri	9,435	12,699	22,787	34.50	79.40
Karimganj	5,691	7,813	19,098	37.20	144.40
Lumding	3,098	3,864	15,278	24.70	295.30

Source: Census of India (1951:17)

Growth in the First Half of the Twentieth Century

While the number of towns grew from 12 to 24, the urban population multiplied two and a half times. A large part of this urban population growth took place after independence and the partition of the country. While in the earliest decades till 1941, the urban population grew by 25–29 % in each decade; the last decade (1941–1951) showed a remarkable increase of over 65 %.

The exceptional increase in the population between 1941and 1951 is ascribed to the refugee migrants from Bengal following the division of that state, following the partition of the country. A large population of Hindus migrated in the neighbouring state of Tripura, as well as the districts of Cachar, Dhubri, Goalpara and Nowgong, and settled, both in the countryside and the towns. Table 15.14 shows the large increase in population of the following towns in 1941–1951 as compared to the previous decade 1931–1941.

The coming of railways witnessed the export of tea, coal, petroleum and timber and not a multiplication and growth of towns.

The Urban Scene in Assam After 1951

The last 60 years were the period of independent India. Regional aspiration led to the division of Assam into three more states, first Nagaland, then Meghalaya and finally Mizoram. The capital of Assam was shifted from Shillong to Guwahati, which as the capital of the state acquired a new status. It was equipped with infrastructure, a secretariat and offices of many new departments that started after 1947.

The post-independence period witnessed an accelerated economic growth. Industrial development of the state took place as never before. The production of petroleum multiplied severalfold, and several refineries were established besides the one at Digboi. The communication system was streamlined. The old metre gauge railway line was converted into a broad-gauge one. Several bridges across Brahmaputra, including a railway bridge at Guwahati that linked several parts of

Table 15.15 No. of towns, urban population and level of urbanisation in Assam between 1951 and 2011

Year	No. of towns	Urban population	Total population	% of urban population
1951	24	344,831	8,208,856	4.2
1961	53	781,288	10,837,329	7.2
1971	72	1,287,222	14,625,152	8.8
1981	80	1,782,376	18,041,248	9.87
1991	93	2,487,795	22,414,322	10.1
2001	125	3,439,240	26,655,528	12.9
2011	214	4,388,750	31,169,272	14.08

Source: Census of India (2001)
Note: The figures for 1981 are interpolated as there was no population census of Assam 1981

the country with the North-East, were constructed. It was now possible to reach the North-Eastern corner of the state, till Tinsukia, on the same wheels from places like Delhi, Mumbai or Chennai. A number of universities including agricultural universities, technical universities and medical colleges were started. Connectivity improved. Both cottage industry and large-scale industries got a boost which led to a sudden increase in the number of urban population in the state. Besides, the state having eight districts in 1951 was further divided into now 27 districts necessitating additional administrative headquarters and infrastructure (Table 15.15).

There was an explosion in the number of towns, though urbanisation remained at a moderate level.

It can be seen while the number of towns showed a tenfold increase between 1951 and 2011, the increase in urban population was almost 14 times, though the total population increased to just over three times. This demonstrates a boost in economic and sociocultural activities in the state that led to an unexpected large growth of urban population. It must, however, be admitted that compared with the rest of the country, where the level of urbanisation is 31 %, Assam still lags behind and at best compares only with some of the poorer states of the country.

15.5.2 The Contemporary Scene in Assam

The level of urbanisation is not uniformly spread. Seen district wise, there is a wide divergence in the percentage of population living in towns (Table 15.16). The variation ranges from 1.2 % for Baksa to 82 % for Kamrup Metropolitan.

There are two areas, which are distinctly more urbanised than the rest. The first is the Guwahati area, and the second is the area of industrial complexes in Dibrugarh, Tinsukia and Jorhat district. Each of these areas has an advantage over the rest; Guwahati is the capital of Assam and the gateway to the North-East, while Tinsukia–Dibrugarh forms an important industrial area of the state with their coal and petroleum resources and their exploitation.

Table 15.16 District-wise level of urbanisation in Assam

Range of urban population in % term	No. of districts in the range	Names of district
<5 %	2	Baksa, Udalguri, Nalbari, Darrang
5–10 %	13	Kokrajhar, Barpeta, Marigaon, Lakhimpur, Dhemaji, Sonitpur, Darrang, Sibsagar, Golaghat, Kamrup, Karimganj, Hailakandi, Chirang
10–15 %	6	Dhubri, Bongaigaon, Nagaon, Goalpara, Karbi-Anglong, Nalbari
15–20 %	3	Dibrugarh, Tinsukia, Cachar
>20 %	2	Kamrup Metropolitan, Dima Hasao, Jorhat
Assam 14.08 %	27	

A high percentage of urban population of Dima Hasao (old North Cachar Hills) is attributed to its low overall density of population where only four small towns, with a total population of just about 60,000, raise the level of urbanisation to over 28 %. Much of the state reflects the inadequate economic growth of the state.

At the apex is Kamrup Metropolitan district with over 82 % of urban population. Guwahati, the capital of Assam, with a population of 968,549, contributes 90 % of the urban population of the district and about one-fourth of the urban population of the state. The district is in fact an urban district. The old Kamrup district was divided into districts, viz. Kamrup essentially rural and Kamrup Metropolitan (Guwahati) largely urban.

Assam has 214 towns of which eight are statutory towns and the remaining 126 are census towns, which together have a population of 4.38 million that accounts for 14 % of the total population of the state.[4] Seven of these 214 towns are classed as urban agglomerations. The urban agglomerations are usually the important cities, with suburban outgrowths or census towns. Table 15.17 presents urban agglomerations arranged in order of their population size.

Usually, agglomerations are large towns, but occasionally two small towns are clubbed together as urban agglomerations. In case of Assam, Lumding and Digboi are such examples. Lumding is categorised as an urban agglomeration because of the addition of some additional townships. In the case of Digboi, Digboi Oil Town with a population of over 16,000, classed as census town, is added to Digboi town administered by a municipal board. Similarly, Lumding, a railway junction with a core population of 25,023, has the benefit of a large railway colony having a population larger than the town itself and together is classified as urban agglomeration.

[4] 1. A statuary town is one that is notified as town under the statutes of the government.

2. A census town is one that satisfies all the criteria for a town as laid down by the census of India, but not notified by the state government under its statutory provisions.

3. An urban agglomeration is a core statutory town with one or several outgrowths or towns in the vicinity with a total population of not less than 20,000, as defined by the Census of India 2001.

Table 15.17 Urban agglomerations and their population in Assam (2011)

Number	Name of urban agglomeration	Population in 2011 of UA	No. of outgrowths	No. of census towns
1	Guwahati	968,549	1	1
2	Silchar	228,985	2	6
3	Dibrugarh	154,019	2	2
4	Jorhat	153,249	(12)	(3)
5	Nagaon	147,137	2	3
6	Tinsukia	125,637	5	2
7	Tezpur	100,477	5	3

Source: Provisional population totals, Census of India 2011, Constituents of urban agglomerations having population of one lakh or above

More than 45 % of the urban population of the state lives in the first ten towns, most of which have a population over a lakh. These are Guwahati, Silchar, Jorhat, Dibrugarh, Nagaon, Tinsukia, Tezpur, Bongaigaon, Dhubri and North Lakhimpur.

There is an asymmetry in the distribution of population in the cities of different sizes. In 2001 about 60 % of the urban population lived in 14 towns, each with a population of over 50,000, and the remaining 40 % was distributed over the remaining 95 towns of the state. The largest number of towns fell in the group of towns with a population of 5,000–20,000 people. These 64 towns, roughly 59 % of the total number, housed only 21 % of the total urban population.

15.5.2.1 Geographical Distribution of Towns in Assam

The urban centres of Assam can be examined separately in three large divisions: (1) the Brahmaputra plain, (2) the Barak plain and (3) the hilly Karbi-Anglong and North Cachar hills.

Towns in the Brahmaputra Plain

Most large towns of Assam with the sole exception of Silchar occur in Brahmaputra valley. The valley has been the cradle of Assamese culture and civilisation, witnessed the rule of many royal dynasties, each with its own territory and capital. It is also the most productive region agriculturally, and with Brahmaputra forming the axis of the east–west-oriented plain, it is the richest part of Assam with a variety of primary and secondary economic activities. Like the territory of the state, the towns of Assam are aligned in a 50 km wide east–west belt from Dhubri in the west to Tinsukia in the east. Most of the towns, west of the state capital Guwahati, are located north of Brahmaputra, while to the east there is a predominance of towns in the area south of the river. Most of these towns are strung along the national highways, number 31, west of Guwahati, and number 37 and its offshoots,

represented by highway numbers 36 and 39, the last one leading to Dimapur, Kohima and further south to Imphal. Secondly, with the exception of Dhubri, Goalpara, Guwahati and Dibrugarh, none of the towns is on the bank of Brahmaputra. Most of them are located a few kilometres away from the river, in a zone relatively secure from the frequent floods of Brahmaputra. Some of these like Nagaon, Jorhat and Tinsukia were connected to the river by a railway loop.

While roots of Guwahati lie in antiquity, Dibrugarh, on the left bank of Brahmaputra, was developed into a river port by the British. Similarly Goalpara on the southern bank of Brahmaputra is located on a rocky projection from Meghalaya plateau and is relatively secure from floods. Dhubri, on the northern bank of the river, was, for long, a custom house on the border between Bengal and Assam. North of Brahmaputra, Tezpur is another town close to the river, though at a height overlooking the river.

Towns on Transport Hub in Brahmaputra Plain

Though apparently the location and the alignment of towns are influenced by transport lines, it is not true in case of Assam. Most towns in Assam plains already existed in form of some settlements, and the transport lines only linked them together. There are, no doubt, some towns which owe their origin to the transport network, a railway junction, a point of transhipment and change of route where a requisite manpower is required. Lumding in Kopili valley in Nagaon district owes its origin and development entirely to railways. Besides being a junction, from where originally a branch of Assam–Bengal railway led to Guwahati, it is now a transhipment point from where the original metre gauge railway line built in the third quarter of the nineteenth century takes one across the Barail range into Barak valley to Silchar and Karimganj in Cachar plain. The railway colony at Lumding houses over 25,000 people, a large enough settlement to be classed a census town which, combined with Lumding, has become an urban agglomeration.

Besides some of the towns like Rangia, about 40 km north of Guwahati, and Rangapara north of Tezpur, Mariani south of Jorhat; Simaluguri, a nodal point on the main North-East Railways, with links joining Sibsagar on the north and Naginimara on the south; and finally Tinsukia that is linked with Dibrugarh are all railway junctions and have received considerable impetus from transshipment activities, warehousing and maintenance staff of railways.

Mining and Industrial Towns

The North-Eastern part of Brahmaputra plain occupied by Tinsukia and Dibrugarh districts is the industrial core of Assam. The area has the advantage of producing not only enough tea but also minerals like coal and petroleum. The entire petroleum of the North-East region and much of the coal comes from this region. Next to Guwahati, these are two better urbanised districts of Assam with well-developed connectivity,

coal mines, petroleum production and a refinery, a number of petrochemical industries and some others based on forests products. Both have around 20 % of their population living in towns.

Urbanisation in the Barak Plain

Cachar district, the main area of Barak basin in Assam, with Silchar as focal point has an urban population of 319,322, which works out to 10.6 % of the total population of the Cachar plain, presently divided into three districts of Cachar, Hailakandi and Karimganj. It is an agricultural region with fishing as secondary occupation. The only industry, if industry it can be called, is the tea gardens of the northern part of the plain. Of the total urban population of the region, Silchar (agglomeration 228,985) accounts for 57.6 %. The only other town of some prominence in the region is Karimganj, a part of Sylhet district of undivided Assam. It has a population of 52,613 in 2001.

Lack of industrialisation has retarded growth of towns in Barak plain. Besides Silchar urban agglomeration, the second largest town of Assam after Guwahati, Karimganj and Hailakandi are district headquarters, the former with a population of 52,613 and the latter with 30,000 people in 2001. Lakhimpur, on Silchar–Imphal road, is another important town. Though tea is an important industry, producing over 30,000 tons of tea annually and employing over 40,000 people, it has not led to any urbanisation. The tea estates remain scattered and don't make for an urban landscape. There are only three major industrial units in entire Cachar plain, a sugar mill at Anipur in Karimganj district and a large pulp and paper unit at Panchgaon in Hailakandi district. Panchgaon with a population of around 5,000, a township of Hindustan Paper Corporation, is a census town. Badapur, an important railway junction with a railway colony, located on the southern bank of Barak, is an important town in Karimganj district.

15.5.2.2 Urban Clusters

Urban clusters are the areas with a number of towns clustered close to each other, usually in an industrial area taking advantage of local raw material resources, manpower, transport facilities and other prerequisites required for industrial development. In such urban clusters, most towns are industrially linked to processing manufacturing, trade and transport activities. Utilisation of by-products of many of these industries leads to the development of further industries and in the process an urban cluster is formed.

At a glance one can spot two or at the most three urban clusters:

1. Dibrugarh–Tinsukia urban cluster
2. Guwahati urban cluster
3. Bongaigaon urban cluster

These clusters represent an area with a series of interdependent industrial units. Besides, they show a level of urbanisation much above the average for the state, with a large number of towns occurring close to each other.

Dibrugarh–Tinsukia Urban Cluster

Besides the three urban agglomerations Tinsukia, Digboi and Dibrugarh, there are a dozen towns, with some industrial units or the other, within a distance of less than 80 km. Doom Dooma, Makum, Margherita, Lido town, Lido Tikok and Bargolai Grant No. 11 in Tinsukia district and Duliajan Sarupathar Bengali, Moran town, Nahorkatiya, Namrup and Chabua in Dibrugarh district are all industrial towns of some importance. Together they represent mining towns, oil refinery, petrochemical complex, plywood production, metal works, railway workshops, river ports and railway junctions besides being important trading centres like Dibrugarh.

Dibrugarh–Tinsukia urban cluster is the industrial core of Assam. A number of subsidiary industries and workshops have appeared following the mining of coal, petroleum and exploitation of forests. The area is well linked with the state capital Guwahati either by fast-running trains or by the main artery of state highway no. 37 running from west to east from Guwahati to Tinsukia and beyond. It is served by an airport and also a river port at Dibrugarh that was functional during the colonial days when the railway transport was inadequately developed. The two main towns of this cluster, around which other cities are developed, have each a population of over 100,000.

Guwahati Urban Cluster

Guwahati as the focal point of this cluster with a population nearing one million has a large area of influence, but there is a small cluster of towns that extends even north of Brahmaputra, and includes towns like Rangia, Hajo, Sualkuchi, Palasbari, Dispur, Satgaon, Kochpara, Dharapur, Chandrapur Bagicha and North Guwahati. Guwahati agglomeration has only one outgrowth, Narangi, with a population of over 10,000 that is not within the corporation limit of Guwahati, but may finally be included.

Though there are a lot of industries in and around Guwahati, they have not led to the development of independent towns as most of the workers commute to Guwahati, the mother city. Besides the petroleum refinery at Noonmati (in Guwahati) and the chemical factory at Chandrapur or mixed granulated fertiliser at Narangi, Indian Carbon Ltd and India Gas Co. at Guwahati and many other industries like hardboard and metal industries, there is a host of cottage industries which goes to make an industrial complex. These industries are located in and around Guwahati and have not developed a typical industrial–urban cluster. Most of the small towns in the surrounding areas are not industrial, and not many independent towns have grown in the suburb as the city growth has not reached a limit that warrants spawning of suburban towns.

Dhubri–Bongaigaon Urban Cluster

Dhubri and Bongaigaon districts together have 13 towns. The catalyst for the development of this cluster is the petroleum refinery at Bongaigaon and a railway colony. Some pre-existing towns like Bijni, a historical city, Abhayapuri and Basugaon in the neighbourhood appear like a cluster of towns. With Dhubri about 70 km to the south, with a number of moderately developed towns like Gauripur, Bilasipara, Mankachar and Chapar, the area is likely to see further development. Dhubri district, straddling the two banks of Brahmaputra, is strategically important in that it forms the boundary with Bangladesh. With the progress of time, the area may witness an intensification of economic activities and show better urban growth.

15.5.3 Some Major Towns of Assam

15.5.3.1 Guwahati

A city of great antiquity, known in early history as Pragjyotishpur, has been the capital of many royal dynasties. Located on the left bank of river Brahmaputra at an altitude of 53 m ASL, it lies partly on the river terrace and partly on the rocky projection of granitic hills, an outlier of Meghalaya plateau (Fig. 15.8). The famous Kamakhya temple is sited on one of such hills with an awe-inspiring view of Brahmaputra appearing like an arm of a sea. The city spreads on both sides of the national highway no. 37 and is still growing along the highway and across the river on its right bank that is linked by a bridge commonly known as Saraighat bridge (Photos 15.7 and 15.8).

With a temple of Goddess Kamakhya, the place is a pilgrimage centre where the devout Hindus, particularly those believing in *shakti* cult of Hinduism, congregate on special occasions. By virtue of its location, the city combines the functions of a regional trading centre, a port city, a garrison town and finally an administrative centre. The town remained neglected during the rule of Ahom kings who chose Sibsagar as their capital and Guwahati only remained an outstation. With the arrival of the British and the accession of the Ahom's empire, Guwahati became a prominent city, with a divisional headquarters, a high court, several educational institutions, hospitals and churches; the city acquired prominence as an administrative and educational centre. Though Shillong was the British capital of Assam, Guwahati was the people's capital of the region.

After the capital of Assam shifted to Guwahati in 1971, the city grew fast with all the support of the Assam Government. Today Guwahati is the gateway to the North-East. The city with a population approaching a million has a state secretariat enclave at Dispur, an oil refinery, a university, a high court, an Indian Institute of Technology and one of the largest tea auction centres and is a trading town in its own right. The population of the town grew from an insignificant 11,661 to 936,429 in 2011 with increasing prospects of further growth (Table 15.18).

Fig. 15.8 The city of Guwahati, the capital of Assam (Adapted from Guide Map, India Tourism, Government of India)

Photo 15.7 Nilanchal Hill, the site of Kamakhya temple; on the right hand is Brahmaputra – Guwahati

Photo 15.8 Suburbs of Guwahati (note the destruction of hills by quarries)

Table 15.18 Population growth of Guwahati

Year	Population	Year	Population
1901	11,661	1961	136,239
1911	12,481	1971	200,377
1921	16,480	1981	(no census)
1931	21,797	1991	582,342
1941	29,598	2001	818,809
1951	43,615	2011	963,429

Sources:
Census of India 1991, Series I-India, Pt. II-A (11)-A Series Towns and Urban Agglomeration, with population 1901–1991
For 2001 – Census of India 2001, Series I, Urban Agglomeration and Towns, p. 198
For 2011 – Census of India 2011, Provisional Population Tables, cities with a population over 100,000, pp. 5–13

The greatest jump in the population of the city occurred between 1951 and 1961, when the population more than tripled. The development activities, the immigration from East Pakistan and finally the shift of capital from Shillong to Guwahati all added to the rapid growth of the city. The surface access to all the states of the North-East that includes Mizoram, Manipur, Nagaland, Arunachal and even Tripura is through Guwahati, a fact that offers it a great advantage.

Internally, the city is not as congested as many other cities in India and can boast of a broad riverside promenade along Brahmaputra. Even the internal structure is quite cohesive, with an inner circular ring enclosing the main market area, the Pan Bazar that is more a shopping street than the CBD of western cities. A less dense area surrounding the core consists of occasional retail shops, semi-detached bungalows and residential colonies. The outer part of the city has the outgrowths and specialised exclaves like Jhalukbari, occupied by Guwahati University, Dispur in the south, a township housing the state secretariat and residential colonies linked to Noonmati petroleum refinery and other industrial complexes like Indian Carbon Ltd. and Fertichem Ltd. at Narangi.

Guwahati is known as the gateway to the North-East. No state of the North-Eastern region can be reached without passing through Guwahati. The transport lines – rail- and roadways – linking other parts of India with the North-East passing through the Siliguri–Cooch Bihar corridor between India, Bangladesh and Bhutan first arrive at Guwahati, the largest city of the North-East, and then radiate to other states. The city is thus a major transport hub and a transhipment point. Though, some of the state capitals of the North-East have direct flight to Delhi, Guwahati is the major airport from which a number of airlines operate feeder services to other areas of the region. Meghalaya and Arunachal Pradesh depend entirely on Guwahati for their air connectivity.

Besides being the economic capital of the North-East, the city is the nerve centre of Assamese literature and culture and boasts of a number of cultural, literary and

Table 15.19 Population growth of Silchar

Year	Population	Year	Population
1901	9,256	1961	41,662
1911	8,785	1971	52,596
1921	10,204	1981	(no census)
1931	13,069	1991	115,483
1941	16,601	2001	184,105
1951	34,059	2011	228,985

Source: op. cit. Table 15.18

social organisations. The latest addition to the cultural landscape of the city is Sankar Kala Kshetia and a well-appointed sports stadium, and the establishment of the Indian Institute of Technology on the right bank of Brahmaputra, across Guwahati, has made the city a very important centre of education.

15.5.3.2 Silchar

Occupying the centre of Cachar plain, an area of about 7,000 km^2 that spreads over three districts of Cachar, Hailakandi and Karimganj, Silchar is the counterpart of Guwahati in South Assam. Situated on the southern bank of river Barak in the midst of a meandering loop of the river, the town is protected by a series of embankments built along the river. Connected by rail, road and even with an air link, it is easily accessible from some of the neighbouring states like Manipur, Mizoram, Tripura and Meghalaya, and one of the main north–south arteries of the region that traverses Assam, Meghalaya, and links Mizoram and Tripura passes through Silchar.

The town grew steadily during the last 100 years from a small town of 9,256 in 1901 to an urban agglomeration of over two lakh in 2011, incorporating several outgrowths and census towns in its fold (Table 15.19).

The momentum for the growth of the city came only after 1947, when a sudden influx of refugees doubled the population; the second spurt in population occurred after 1971 when within a space of two decades (1971–1991), the population of the town doubled.

The main economic stay of the population is agriculture, largely rice cultivation and the commercial cultivation of tea, linked to a large number of tea gardens, largely in the northern piedmont of the district. Fishing is another occupation of the people. With 60 tea estates in the vicinity, the town also works as a conduit for tea export and wholesale trade.

Culturally, Silchar is a world apart from the Brahmaputra plain. Majority of the people speak Bengali as their mother tongue, and the culture of the town as well as the region is more akin to West Bengal and Bangladesh. The newly established Assam University, about 20 km away from Silchar, reflects the dominance of Bengali language and culture. Though named ‘Assam University’, there is hardly anything Assamese about it.

Table 15.20 Population growth of Dibrugarh

Year	Population	Year	Population
1872	2,774	1941	23,191
1881	7,193	1951	37,191
1891	9,876	1961	58,480
1901	11,227	1971	80,348
1911	14,563	1991	120,127
1921	16,997	2001	137,661
1931	18,734	2011	154,019

Source: op. cit. Table 15.18

Structurally, the city is an unorganised criss-cross of streets; the main roads don't give the impression of a large town, and the suburbs are replete with colony of thatched huts in areas most susceptible to flood. Tea, mustard oil, areca nut and jute and bananas are the article of trade in the town.

15.5.3.3 Dibrugarh

Located on the left bank of Brahmaputra, like Guwahati, Dibrugarh is the third largest town of Assam. The progress of the town can be gauged from the fact that in the last quarter of the nineteenth century, Dibrugarh was a very small settlement with a population of 2,774 in 1872. It was smaller than Goalpara, Guwahati, Barpeta, Nowgong and Sibsagar, but with the establishment of the river port, it grew fast and in 1891 became the largest town of the present-day Assam, larger than even Guwahati. In 1901, its population was virtually the same as that of Guwahati with over 11,000 people. In the succeeding decades, Assam had two important cities, i.e. Guwahati and Dibrugarh, the former a main administrative complement to the capital Shillong and the latter an important centre of trade for tea, oil and coal and remains so to this day.

Like any other city, the city grew fast in the last half century as can be seen from the decadal population of the town for the last century (Table 15.20).

It was an important place in the north-eastern part of the state to control the territory with a garrison, a jail, a hospital and an English newspaper. Above all, the town was the port and the service centre for the tea estates owned by British planters. Grains, oil, salt, and piece goods were imported from Bengal by boat to be distributed among the centres in the vicinity of tea gardens. It remained an important river port for the export of many commodities including tea for long. Till 1950, there was a regular steamer service, up the river Brahmaputra up to Dibrugarh and beyond. The earthquake in 1950 caused a change in the channel depth, and the steamer service was shortened to terminate at Jorhat. With effective broad-gauge railway link from the mainland, the long distance river navigation is discontinued.

With the development of industries like petroleum and coal and a number of other subsidiary and processing plants, Dibrugarh still remains an important industrial

and trading centre. The town is linked to Tinsukia, the main terminus for the North-Eastern Railway, though many goods and passenger trains start from Dibrugarh. The river port is defunct, but railways have their biggest workshop in Dibrugarh. Being a large town, it is the major urban centre for delivering goods and services in the area. The town also delivers goods and services to trans-Brahmaputra Assam in North Lakhimpur and Dhemaji districts and is the only airport accessible to and used by the surrounding districts of Arunachal Pradesh.

Culturally, the town holds its own with a university, several colleges and technical institutes, auditoria and theatres. But essentially, the city is the point of exchange and primary service centre for its industrial hinterland and a trading centre for the commodities produced in the region.

15.5.4 The Contemporary Urban Scene in North-East India

The urban scene in North-East India does not present a very vibrant picture. With just 18.35 % of the region's population being in 414 towns spread unevenly across the region, it does not fit in the national picture where the level of urbanisation is over 31 %, with some states like Maharashtra showing 45 % urbanisation. There has been, no doubt, a robust urban population growth of 37 % in the 2001–2011 decade, but it is not enough to bring it at the national level. In terms of urbanisation, North-East still remains in the league of India's poorer states like Bihar and Orissa.

The average population of a town, expressed by dividing the urban population with the number of towns, is 20,212 in contrast to 47,525 for India as a whole. Guwahati the largest town is just touching the million mark. And out of a dozen towns with a population of over 100,000, seven including Guwahati are in Assam, and the remaining four are state capitals. Dimapur is the only town, which is outside Assam that has grown as important trading centre.

Functionally, the cities of the North-East have remained administrative headquarters, centres of distribution and providers of education, health and transport services. There has been no substantial investment in industry. Tourism, though well advertised in the name of 'Incredible India', has not attracted either tourists or the associated hospitality industry. It may be observed that tourism develops only if the tourists feel welcome in a region and not threatened by possible extortion or abduction.

The traditional pattern of urban location followed the Brahmaputra lifeline, with roads and railways aligned to the river, though at safe distance to remain immune to floods. Thus, there was a string of towns all along the valley, from west to east. The situation is changed now, as newly emerged states have their own cities. Thus, cities have now moved from river valleys to hills in Arunachal Pradesh, Nagaland and Mizoram. The transport network of the region has expanded and even improved. The region has the largest density of airports, and air services are available to the capitals of all the states. Yet, an accelerated economic development is still to arrive. The environment for industrial development is yet to grow.

Assam, the core of the region, has a rich historical and cultural tradition. Jorhat, Sibsagar, Guwahati and Barpeta are old towns, having their own literary, religious and cultural associations. Guwahati, being the gateway to the North-East and the nerve centre of the region, with a host of educational, scientific and cultural institutions, is the prime city of the region that provides leadership in most political, linguistic and cultural matters. Yet, it has not been able to attract economic activities that could boost the growth of the city and the region.

Assam, with five universities, an Indian Institute of Technology and several medical and engineering colleges and technical institutions, is the undisputed leader in education and is creating a corps of employable young people. Other states also have their educational institutions in each state. It is a matter of time before these people initiate local enterprises and add to the economic prospects of the region.

More people from the North-East are now moving to other cities of India, for education, business and employment, and there is not much that could attract people from outside. The four petroleum refineries are not employment-intensive enterprises, and few other industries like sugar, paper, cement and chemicals are not enough. Tea gardens – plantation and processing – still remain the largest employer of people. But, these have reached such a maturity that the industry with its factories, staff and coolie lines has turned into a self-sustaining system, not requiring ever increasing manpower from outside. With a low density of population, and some of the states still facing turbulent times, the process of urbanisation is a very slow process.

Many believe that opening the region through the 'Look East Policy' and establishing active communication with Southeast Asian states, like Myanmar, Thailand, Vietnam and Malaysia, will pave way for voluminous trade and investment, and the region may witness better days and increased economic activities. Given a political stability and peaceful environment, an active India–Southeast Asia interaction and trade through the North-East corridor may turn the latter's fortune, and new industries and cities may spring up. But a congenial environment for such development needs to be created.

References

Barua KL (Rai Bahadur) (1933) Early history of Kamarupa from the earliest times to the end of the 16th century. Shillong (published by the author), 2nd edition in 1966 published by Lawyers Book Depot, Guwahati

Census of India (1891) Census of Assam 1891, pt. II, Report. Supdt., Govt. printing Press, Calcutta

Census of India (1901) Assam. vol. IV, pt. II Tables by B. C. Allen, Shillong, 1902

Census of India (1951) Assam, Manipur and Tripura. vol. XII, pt. II-A, tables, pp 17–25

Census of India (1991) Final population totals, Series I-India, Pt. II-A (11)-A series

Census of India (2001) General population tables, India states and union territories. Table A1 to A3 pt. 1, pp 182–210

Census of India (2011) Provisional population tables of Assam and all states of the North-East

India Tourism. The city of Guwahati. Government of India

Superintendent, Government Printing Press (1883) Report on the Census for Assam for 1881, Calcutta

Survey of India. Guide map of Shillong. Government of India, Dehradun

Part IV
The Economy

Chapter 16
Agriculture in North-East India: Past and Present

Abstract Agriculturally, North-East India lies in the Southeast Asia rice domain. Rice is the principal food crop. Besides, the region, especially Assam, is famous for tea. New plantation crops that have entered the area are rubber and several varieties of tropical and temperate fruits. The most traditional tree crop that is grown in homesteads, and not in commercially organised plantations, is areca nut. The region, however, does not have much cultivable land, which is confined to the two alluvial valleys of Assam. Only 16 % of the area of the region is under cultivation, and the total cropped area including area under multiple cropping doesn't exceed 22 %. Rice, the major crop, claims over 85 % of the cropped area. The region is known for 'slash and burn' type of shifting cultivation, locally known as *jhuming*. About 12 % of the net sown area is under shifting cultivation, and over 400,000 families are still engaged in this kind of farming. Lately, the land under shifting cultivation is being brought under horticulture. Besides rice, other important crops in the region are pulses and maize. Rubber plantation is becoming a popular commercial plantation in Tripura. Agriculture, in the region, suffers from low productivity, and floods frequently damage even better crops. The average yield of rice for the region is around 1,600 kg/ha, though in Manipur the rice yields are higher and linger around 2,400 kg/ha. Tea plantation is the principal plantation crop of the region. The region has over 30,000 large and small tea estates, occupying roughly 280,000 ha of land. Over 95 % of the area of the region under tea is in Assam, centred largely in Darrang; Lakhimpur, on the north bank; and Tinsukia, Dibrugarh, Sibsagar and Jorhat on the southern bank of Brahmaputra.

No other occupation of mankind carries such an imprint of physical environment as agriculture. This is adequately demonstrated in the agricultural typology and cropping pattern of North-East India. Covered by a warm and rainy climate, the North-East of India is essentially a land of rice, the staple food of the region, supplemented by fish, meat, pulses and oils, specific to different communities. Rice, mustard, pulses and sugarcane are the traditional crops of the region. Maize, potatoes, chillies, pineapple and several temperate vegetables were added later on during the colonial period.

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Tobacco was brought by the Portuguese in the early sixteenth century. For centuries, two different kinds of agriculture have been practised in the region, viz. sedentary agriculture in the plains and shifting cultivation, regionally known as *jhuming*, in the hills. The system of 'slash and burn' is very old, older than the settled agriculture, and continues, even to this day, in the peripheral hills and plateaux of the region and is practised largely by tribal communities.

16.1 Land Tenure and Agricultural Management in the North-East: A Historical Perspective

Agriculture and land use in Assam and the adjacent hills have expanded greatly over the centuries and decades. Reliable information about agricultural practices is available from the records of the Ahom kings who ruled Assam for 600 years. The economy of the country, ruled by the Ahoms, was managed through what was known as the *paik* system (Sarma 1981). This applied as much to agriculture as to other sectors of the economy. The *paik* manpower was grouped into two categories, viz.:

1. *Kari paik*
2. *Chamua paik*

The *kari paiks* were required to render manual service or worked as ordinary soldiers, whereas *chamua paiks* were the officers of the state. There was a well-knit hierarchical arrangement, where *paiks* were given different designations. The status of a *chamua paik* depended on the number of *paiks* he commanded. Virtually the entire male population of the kingdom was in the service of the state. 'These militia men enjoyed usufruct of about 3 acres of wet paddy land per head. For them, such land holding was a matter of both right and privilege. Wet lands belonged to the state and were distributed on the above basis… When one was exempted from labour and produce share, he had to pay a poll tax or cash. And when one held wet land in excess, then too, he had to pay levy in cash for the surplus land' (Guha 1979). Each constituent of the *paik* system had to serve for 3 months in a year. This meant that service of one person was assured in perpetuity against a grant of 12 acres of land.

There was no rent for the land that did not fall in the category of 'wet rice land'. Homestead and garden lands in one's possession were deemed private property, subject to a degree of clan control. In the pre-British period, culturable, but inferior land was so abundant that the property rights of the occupants of these lands were never questioned. As Guha (1979) states in the pre-British time, one could occupy any amount of land (that was not wet rice land) for rent-free seasonal cultivation. The uncultivated land remained common grazing grounds. Besides, there were some feudal estates owned by the king, the nobles and priests and worked by private serfs, slaves or workers assigned to these farms by the state. Over 80 % of the land of Assam even at the close of the nineteenth century remained untouched by plough, and only 3 % of the population belonged to the working class (Barpujari 1998). In fact, Assam had to depend on Bengal for food grains. No doubt, Assam supplied

cotton and mustard to Bengal (Acharya 1983), yet its dependence for food on Bengal remained a subject of concern. By some estimates, just before the annexation of Assam in British territory in 1826, only about 14 % of the area was put under crops, and less than 20 % of the total area was settled for revenue. The availability of vast tracts of cultivable wastelands remained an important feature of Assam's agrarian economy[1] (Guha 1979).

16.1.1 Tenure System During the Early British Days

The tenure system consisted of two kinds of land for the purpose of revenue in the late nineteenth century**.** Quoting the records of the Land Revenue Administration of Assam for 1897–1898, Guha's statement (1979) gives the following types of tenure system. The two main categories of land revenue systems were in existence: (1) land settled for ordinary cultivation and (2) land settled for special cultivation under wasteland grants. The categories were further subdivided as follows:[2]

1. Land settled for ordinary cultivation –	1,843,414 acres (76.8 %)
(a) Lakhiraj (revenue-free) –	82,910 acres (3.4 %)
(b) Nisf-Khiraj (half rent) –	192,702 acres (8.2 %)
(c) Khiraj (full rent – non planters) –	1,468,798 acres (61.2 %)
(d) Khiraj (full rent – land held by planters) –	97,004 acres (4.0 %)
2. Land settled for special cultivation under waste land grants –	555,570 acres (23.2 %)
(a) Fee simple (revenue-free) –	331,878 acres (13.4 %)
(b) Rate paying (concessional) –	223,692 acres (9.8 %)
Total settled acreage –	2,398,884 acres (100.0 %)

The introduction of the *ryotwari* system in Assam cut down the number of privileged nobility and the number of peasant proprietors increased. The different categories of landowners during the British period were as follows:

Percentage of different categories of landowners during the early British period (1901):

1. Self-employed peasant proprietors	89.0 %
2. Tenant farmers	7.0 %
3. Landlords	0.8 %
4. Farm servants	0.3 %

Source: Census of India, 1891, Assam, pt. II, table XVII, pp. 310–319

[1] It must be stated that Assam proper, according to Guha, comprised only six districts of Brahmaputra valley, viz. Goalpara, Kamrup, Darrang, Nowgong, Sibsagar and Lakhimpur.

[2] Sourced from the Records of Land Revenue Administration of Assam 1897, quoted from Guha (1979: 82). These figures refer to the total of five districts of Kamrup, Darrang, Nowgong, Sibsagar and Lakhimpur.

Table 16.1 Land utilisation in Assam[a] in 1903–1904 (area in sq. miles)

Classification of area	Area in sq. miles	Percentage of the total geographical area
1. Total area	28,894	100.00
2. Net cropped area	7,730	26.75
3. Current fallow	1,980	6.85
4. Total occupied area	9,710	33.60
5. Cultivable waste other than fallow	12,258	42.42
6. Not available for cultivation	3,148	10.89
7. Forests	3,778	13.07

Source: Imperial Gazetteer of India (1907), p. 7

[a]Excluding feudatory and tributary states and areas for which no returns exist

But, despite the transfer of ownership of lands to the tenants during the British rule, monetization of the economy and cash payment of rent made the peasantry near impoverished. This happened because of low productivity of land resulting from traditional mode of cultivation and the compulsion of the farmers to sell a large portion of the agricultural product to pay the land rent. Though there was plenty of land lying un-reclaimed, the farmers' family depending on traditional methods had to plough, plant and harvest with their own hands. These farmers found it too taxing to put additional labour to cultivate more land. An additional factor was the non-availability of agricultural labour. In Surma valley, Kamrup and Goalpara agricultural labour was extremely scarce, and in central and upper Assam, they were practically non-existent (Imperial Gazetteer 6:5).

16.1.2 Land Utilisation and Cropping Pattern in the Early Nineteenth Century

No state of India has undergone so many changes of area of its outline as Assam. It grew by acquisition of the adjacent territories, adding them on to Assam; the outline of Assam, as it existed in 1946, was different from what it turned out to be after the partition of the country in 1947. Then the vivisection of the state and the emergence of a number of new states started, leading to a widely varying record of area of the state in different years. Land utilisation records of Assam, therefore, defy comparison and are available from different sources (Table 16.1). The areal units also vary from acres to sq. miles and hectares to km^2. To compare these figures, conversions become necessary.

The earliest land utilisation details for Assam are available for 1905, and more regular records have been maintained by different states of the region after 1950, usually by the Directorate of Economics and Statistics.

In the beginning of the last century, one-third of the land in Assam (essentially the plains) was cultivated, of which 26.75 % was sown every year and 6.85 % was left fallow. This is certainly much lower than present level of net sown area in the state that stands at 34.4 % of its geographical area (Table 16.2).

Table 16.2 Variation in the land use expressed as percentage of the geographical area of Assam during the last 100 years

	1903–1904[1]	1957[2]	2006[3]
1. Net sown area	26.75	17.98	35.60
2. Forests	13.07	36.90	24.60
3. Non-agricultural uses and barren and uncultivated land	42.42	38.01	32.28
4. Fallow	6.85	3.22	1.87
5. Permanent pastures, miscellaneous groves and culturable waste	10.89	3.86	5.67
Total	99.98	99.97	100.02

1. Imperial Gazetteer of India (1907) (The data excludes feudatory states and the areas from which no returns were available)
2. Government of Assam (1966–1967)
3. Government of Assam (2006)

Despite the non-compatibility of data, because of frequent reorganisation of the territory in the North-East region of India, certain facts emerge very clearly. First, there is increase in the net sown area, suggesting that more land has been brought under cultivation. Equally, there is shrinkage in the land that was left as cultivable waste as also in the area of permanent pastures and wasteful miscellaneous crops. The increase in the forestland reflects the policy of the British Government to preserve the forests for commercial exploitation.

16.1.3 Cropping Pattern in the Early Twentieth Century

Rice was by far the most important crop not only of Assam but also of the entire North-East region of India. Traditionally, rice, rapeseed with mustard, pulses and sugarcane have been the principal crops of the area, standing in the order of their importance. Of the 7,730 sq. miles of net sown area in 1903–1904, the distribution of crops was as follows (Table 16.3):

Rice occupied over 80 % of the total cultivated land. The farmers, even in the beginning of the twentieth century, had developed different varieties of rice to suit the conditions of terrain, soil, flood-prone areas and the moisture regime. The importance of rice has to be seen in the light of the general nutritional requirement of cereals, fats and proteins. The populace in the region depends on rice as the most suitable crop that grows well in the region. The need for protein is met by pulses, particularly among a large number of vegetarians and Vaisnavites in the region. The tribal population of the hilly region largely depends on animal proteins. The plains people cultivate oil seeds, especially mustard, in the *chapari* land that is subjected to annual floods where the crop is grown after the flood waters recede.

Table 16.3 Acreage of different crops in Assam in 1903–1904

Crops	Acreage in sq miles	Percentage of NSA
Rice	6,188	80.05
Wheat	16	0.21
Millets and pulses	157	2.03
Sugarcane	63	0.81
Fodder crops	57	0.74
Tea	528	6.83
Tobacco	7	0.09
Cotton	6	0.07
Total	7,022	
Others including oilseed	708	9.16
Total net sown area	7,730	99.99

Source: Imperial Gazetteer of India (1907: chapter 1, Agriculture, tables 1 & 3, pp 97–100)

16.2 Physical Environment, Choice of Crops and their Distribution

The North-East region has contrasting relief features, and the situation in the plains of Brahmaputra and Barak is vastly different from the hilly areas of Meghalaya plateau and the peripheral mountainous regions of Arunachal Pradesh, Nagaland and Mizoram. Tripura, on the other hand, has a combination of hilly areas as well as a low-level alluvial plain. The result is a range of farming typologies that have evolved and are adopted in different physiographic regions.

The description of agriculture here, as adjusted to conditions of relief and climate, is divided into two parts: (1) agriculture in the plains and (2) agriculture in the hilly areas.

16.2.1 Adaptation to Environmental Conditions and the Development of Optimal Farming System in the Plains

The valleys of Brahmaputra as well as Barak present an extremely low-level alluvial plain ranging in height from 45 to 150 m ASL. Lying in the tropics with heavy rainfall, these have a warm and humid climate. No area in these plains with the exception of some rain shadow pockets receives a rainfall of less than 2,000 mm, and the summer temperatures shoot over 35 °C. The summer monsoons last for over 4 months, bringing copious rains and causing severe floods in both the rivers. This is the ideal climatic condition for growing rice, which grows at heights ranging from sea level to 2,000 m ASL. Wherever there is flat land below 1,500 m ASL, rice appears as a dominant crop. It is grown in hilly areas on the lower terraces and as a crop in shifting cultivation system, regionally known as *jhuming*. In the valley plains that carry a deep mantle of silt, it is all pervasive.

The Assamese farmers have made the best use of rainfall regime, site and soil conditions and favourable temperatures, besides adapting to moisture regime and the susceptibility of the areas to floods. In the process, they have developed a cropping pattern with an agricultural calendar that is near ideal to the conditions of the region. Contemporary innovations in farming have provided today's farmers with many more options than what existed a century ago.

In *Brahmaputra valley*, the suitability of sites for different crops depends on the location of the area in a specific segment, in a north–south transverse profile of the flood plain and in relation to the river. The plain is visualised as consisting of four zones on either side of the river:

1. *Chapari* land is the actual flood plain of the river subjected to annual inundation.
2. The zone next to the *chapari* is the land away from the river experiencing floods occasionally. This coincides with the lower terrace.
3. The zone with the maximum north–south width, almost immune to flood, coincides with the middle terrace. This is the main agricultural zone, the rice bowl of Assam.
4. Piedmont zone is the zone sandwiched between the Brahmaputra plain and the mountain on either side of the river.

16.2.1.1 Crop Distribution in the Four Zones of the Brahmaputra Plain

1. *Chapari land*, usually covered with tall grasses and jungles, is, as a rule, burnt as in shifting cultivation and is sown with *ahu* rice, which is harvested before the area is submerged under high waters. It is sown in March and April and harvested in July, before the land is invaded by floods. After the floods recede, the *chapari* land is cultivated again. Taking advantage of moisture in the soil, this area is sown with rapeseed and mustard or some variety of pulses, which are harvested in March. Though the yields of *ahu* rice are low, this is an intelligent use of land where the crop regimes are adjusted in the lower part of the flood plain, to escape the fury of the flood and utilise the early rains for growing paddy, and the moisture and fertility, generated after the flood, to grow a good crop of rapeseed and mustard.
2. *The land next to chapari* – This is the outer part of the flood plain, inundated only when the floods rise high. This land is used for growing a special variety of rice with long stems, locally known as *bao* that grows despite the flood and survives because of its long stem. Sown in April and May, after some light showers, the crop is harvested in November and December. While the *ahu* variety of rice grown in *chapari* land is harvested before the floods, *bao* keeps growing even during flood season, keeping the foliage above water because of its long stem, and is harvested only in winter.
3. *The flood-free zone of Brahmaputra plain* – The east–west Brahmaputra plain, extending from Sadiya, close to where the river debouches from Arunachal Hills

to Dhubri where it takes a southward turn, not exceeding 70 km in width, is the mainstay of Assam's agricultural economy. This is the rice land growing a high-yielding variety of rice known as *sali*, with two sub-varieties, viz. *bar* and *lahi*. *Bar* is transplanted rice, has a longer maturity period, requires more water and gives higher yield. It occupies most of the agricultural land of the plain that is flood-free. This zone is also the most thickly peopled area of the state.

4. *The Piedmont zone* – This is a very gently sloping land at the foot of the mountains, both in the north and south of the plain. This zone has the advantage of irrigation from the streams emerging from the mountains. The interfluves between the streams though not so fertile get the benefit of irrigation, and the chances of crop failures are minimised. This zone, like other areas, also grows rice along with some garden crops. The chief crop is *sali* or alternatively a transplanted form of *ahu* locally known as *kharma*.

This division of agricultural or crop zones in Brahmaputra plain is more schematic and not universal. There are areas where the *chapari* crop is absent and the *sali* land covers the entire stretch. Besides rice, mustard and pulses, another traditional crop is sugarcane. Though occupying a small acreage, sugarcane has been traditionally grown on higher lands near the village site, for reasons of protection and subsequent crushing which is usually done in the village.

Cachar Plain

Unlike Brahmaputra plain, the Barak alluvial belt known as Cachar has no *chapari* land and represents a belt of cultivated land between the tea garden-covered piedmont region in the north and the rising hills of Mizoram in the south. In between is the Cachar plain with its centre at Silchar. Though Barak is not flooded as frequently as Brahmaputra, there are long and shallow depressions – the cut-offs of old meanders – developed following the change in the river course. This zone that turns into a great swamp during the rains is known as *haors*. A variety of long-stemmed rice known as *aman* is grown here. The crop regimes in Cachar plain are similar to these in Brahmaputra plain. The transplanted rice known as *sail* corresponds to *sali* of Brahmaputra valley. The early variety, which is sown broad-cast early and harvested before floods, is known as *aus*. A variety of rice that is grown after the rains in Cachar is called *sailburn* and is quite suited to the *haors*. With a long maturity period, *sailburn* variety of rice, harvested in May, is known for its high yield. In Cachar, as much as in Brahmaputra valley, the main crops are rice, mustard, pulses and sugarcane.

16.2.1.2 Traditional Cropping Pattern of the Plains

The traditional cropping pattern of the plains has been always dominated by rice, followed by oilseeds, pulses and sugarcane. No doubt, tea gardens claim a substantial

area, but that was, and still is, a kind of commercial agriculture not practised by Assam farmers but by organised corporate bodies. That cannot justifiably enter the cropping pattern of the area, which is based on the need and judgement of the farmers.

As seen earlier 27 % of the area of the state, largely in the plains, was cultivated annually, and the principal crops were rice, mustard, pulses sugarcane and tobacco. Rice, the main source of sustenance, claimed 80 % of the area. Tea, an important plantation crop of Assam, occupied an acreage, second only to rice, and covered 528 sq. miles of land in 1903. Today the North-Eastern region has over 900 tea estates, most of them in Assam and some in Tripura, occupying 5,120 km^2 of area and producing around 450,000 tons of tea every year, of which over 95 % is produced in Assam and the remaining in Tripura.

Assamese homestead is a very old institution and is alive even today. In this rural system, every family has a small piece of land, surrounding or attached to his house, which is used as kitchen garden growing vegetables and some fruit trees like banana and jackfruit, besides the perpetual presence of a few trees of areca nut, coconut and a bamboo grove. According to some estimates, the land earmarked for the homestead accounts for 15–20 % of the agricultural holding of the family. Sometimes, patches of sugarcane and even mustard are observed in the backyard of a house.

16.2.2 Agriculture in the Hilly Areas

16.2.2.1 Jhuming or 'Slash and Burn' Cultivation

Leaving aside the plains of Brahmaputra and Barak, i.e. Assam proper and Cachar, the Imphal plain in Manipur and the western part of Tripura, there was no annual system of cultivation in other parts of the North-East region. The hills of Arunachal, Nagaland, Manipur, Mizoram and Meghalaya; the hilly regions of Assam, represented by Karbi-Anglong and North Cachar hills; and the hilly parts of Tripura all inhabited largely by indigenous tribes practised shifting cultivation or *jhuming*, a practice that continues even today. The practice of *jhuming*, the slash and burn type of cultivation, persists in the region, though on a much smaller scale (Photos 16.1 and 16.2).

There is a huge corpus of literature on shifting cultivation in the North-East region. During the British days or even earlier, there was no organised effort to help the people of these hilly regions to adopt an optimal land use, and the inherited practice of *jhuming* continued. *Jhuming* in the North-Eastern region of India consists of clearing a patch of forests, assigned to a family by the tribal chief, by felling and burning and growing of crops for a few years, before shifting to another site, leaving the earlier one for recuperation. The usual cycle, before the same plot is cultivated again, was 10–15 years earlier and in some cases even longer. But, with the growth of population, the *jhuming* cycle has shrunk to 4–5 years, and consequently the productivity has declined. The most important feature of this type of farming is the use of primitive tools, like axe and hoe, with no use of plough or modern

Photo 16.1 Garo Hills, burning of forests for shifting cultivation (in March)

Photo 16.2 Mountain slopes in Nagaland having shifting cultivation: landscape after slash and burn (note some forest patches in the background)

technology. At any time, a field subjected to *jhum* carries a combination of crops varying from three to ten crops at a time. These include cereals like rice, millet and maize and a large number of vegetable crops with different periods of maturity. This enables the farmer to take out different crops for subsistence, at different intervals, one after the other. The second year of a *jhum* field usually has a monoculture of rice (Dikshit and Dikshit 2004).

Planting requires several weeks and involves millet, chillies, melon, maize, eggplant, taro, varieties of gourds, ginger, cotton, banana, onions and even sugarcane. The first to ripen is maize; by mid-June the farmers start extracting maize from the field, though the main crop is expected later. There is a sequence in the harvesting of crops though it may not always be followed.

Crop	Time of harvest
Maize	June
Millet	August
Paddy (rice)	September
Taro	October
Ginger and turmeric	November, December
Chillies and cotton are the last crops to be harvested	

The variety and mixture of crops as well as the sequence of planting and harvesting vary from region to region, but felling of trees and burning the forests after allowing the felled trees to dry are an indispensable feature. This is a labour intensive process which often turns into a community enterprise with groups of tribals helping each other.

Area Under Jhuming

The states of the North-East region, together, have an area of 3,870 km^2 under shifting cultivation, which is about 10 % of the total net sown area of all the states, though area affected by shifting cultivation is much higher (Table 16.4).

About 12 % of the net sown area in the North-East region is subjected to shifting cultivation. Relatively a small area, a little over 2.5 % of the net sown area, is under *jhum* in Assam, largely confined to Karbi-Anglong and North Cachar district, while Mizoram and Manipur have more than 65 % of their cultivated area under shifting cultivation. In contrast, Nagaland has less than 40 % of its net sown area under shifting cultivation despite the fact that it has the highest hectarage of land under *jhuming*, but in relative terms it has a lower percentage of net sown area under *jhuming*, because in recent years, it has expanded its area under annual cultivation. Tripura has less than 10 % of the net sown area under shifting cultivation. A high percentage of land under shifting cultivation in the hilly areas of Manipur and Mizoram is understandable, as the Nagas of northern Manipur and the Mizos continue practising *jhuming* in the forestland that is not part of their personal holding. Forests, in these areas or for that matter in the entire North-East region, are not fully nationalised to

Table 16.4 Area under shifting cultivation in the North-Eastern states of India (in km^2) excluding Sikkim

States	Geographical area (km^2)	Net sown area in km^2 and its % of geographical area	Area und shifting cultivation (km^2)	Shifting cultivation area as % of NSA	Total area affected by shifting cultivation	Number of families engaged in *jhuming*
Arunachal	83,743	1,660 (1.98)	700	42.16	2,100	54,000
Assam	78,438	27,010 (34.43)	696	2.57	1,392	58,000
Manipur	22, 327	1,400 (6.27)	900	64.20	3,600	70,000
Meghalaya	22,429	2,400 (10.70)	530	22.68	2,650	52,290
Mizoram	21,081	910 (4.31)	630	69.23	1,890	50,000
Nagaland	16,579	2,610 (15.74)	1,014	38.85	6,300	116,056
Tripura	10,486	2,770 (26.40)	223	8.05	1,115	43,000
Total for NE region	255,083	38,760 (15.2)	4,694	12.10	14,660	443,336

Source: Basic Statistics of NER (2006, p. 171 and 176). The area under shifting cultivation and the area affected by shifting cultivation are taken from the Report of the Task Force of Shifting Cultivation (1983), Ministry of Agriculture, Government of India

fall under reserved category and are owned by the village communities providing favourite grounds for shifting cultivation. For instance, 88 % of the forests of Nagaland are either owned privately or by the village communities, and the State Government claims the ownership of only 12 % of the state forests.

About half a million families in the North-East region are engaged in shifting cultivation. This estimate suggested by the Task Force (1983), constituted by the Government of India and reproduced in the Table 16.4 relates to the early 1980s when the population was far less. In Mizoram, Manipur, Nagaland and Arunachal Pradesh, a large number of families are still engaged in *jhuming*, though its intensity is gradually declining.

The yield of crops in *jhuming* system is difficult to calculate, and all the states don't provide the yield of crops under different farming systems while giving the yield of paddy a common figure of 2,000 kg/ha, with variations both positive and negative. Tripura has a yield of 2,370 kg/ha for rice, while in Assam it is around 1,500 kg/ ha. The only state for which yield of rice for *jhuming* and settled systems of farming are available is Nagaland, where the yield of *jhum* rice, 1,300 kg/ha, is way below a yield of 1,800 kg/ha for regular irrigated rice.

16.2.2.2 Prospects of Shifting Cultivation

Despite the fact that *jhuming* is practised in the hilly region of North-Eastern India since antiquity and is integrated in the socio-economic and cultural life of the people, it is not viewed with favour by agricultural scientists, foresters, biologists and the people at large. This subsistence farming system, despite being uneconomic, continues not only because of non-availability of suitable agricultural land but also because of poverty and unemployment. It is not a gainful economic activity and is destructive of forests and biodiversity of a region.

The governmental scheme of terracing has not been very successful as it is based on a half-hearted initiative of the government, not backed by massive funding and deep involvement of the official machinery and agricultural research organisations. There has been considerable research in this kind of agricultural activities by agricultural scientists, economists and even biologists, but the net result of the researches has been neither conclusive nor applied in practice. Indian Council of Agricultural Research, through its agricultural research complex in Barapani, in the neighbourhood of Shillong; Assam Agricultural University through its Agro-economic Centre at Jorhat; and North-Eastern Hill University through its Sociology and Biology departments have made serious studies of the contemporary practices and even suggested improved techniques of cultivation on the slopes, but not much has happened. The Economics Department of Tripura University also studied this problem, but all these studies remained only academic exercises (a brief bibliography on shifting cultivation is appended at the end).

Replacement of Shifting Cultivation by Horticulture

What is happening today is the gradual decline of shifting cultivation and its replacement by horticulture or other plantation crops. To quote an instance, many slopes in Tripura are being utilised for rubber and tea. In Garo Hills, areca nut, cashew, pineapple and bananas are colonising the slopes as a safe and more profitable economic activity. Apple and kiwi are being introduced in Arunachal Pradesh, and passion fruits, oranges and *litchis* are gaining ground on the hill slopes. In Mizoram, cultivation of cardamom and ginger as condiments and orange and pineapple as fruits is introduced, though without making substantial dent in the practice of *jhuming*.

The strategy for stopping shifting cultivation has to be based not only on the assessment of ecological damage and the loss of biodiversity and precious forest resources but also on a convincing argument for a radical change in the utilisation of slopes that could benefit the *jhumias*. The most appropriate use will be horticulture with a variable combination of species that are suited to the specific physical environment like height, temperature, the gradient of slopes and the amount of rainfall. Specific areas have to be evaluated for such species of fruits or other plantation crops as could grow in these areas. Development of pastures and dairying has been tried in the North-East only on experimental basis. The food habits of the people in the hills of the North-East don't give much importance to dairy products, but dairying in these cooler climates, with breeds of cattle generally thriving in temperate latitudes, could be tried here.

16.2.2.3 Some Excellent Traditional Farming Systems in the Hilly Areas of North-Eastern India

Besides *jhuming*, which has a deleterious effect on the environment and economy, there are certain agricultural and irrigation practices in the hilly areas, which are very ingenious in utilising the land and water resources of the region by using

technologies that have evolved over the centuries. These practices, as a system of farming, remained confined to their places of origin and were not diffused mainly because of difficult terrain conditions. Popularisation of these indigenous farming systems with some modification, in similar agro-climatic conditions, will greatly help in enhancing agricultural production (Prasad and Sharma 1994). The I.C.A.R. Research Complex for the North-Eastern Hill Region has discussed some of these practices. These are[3]:

1. *Zobo* system of slope management by the Chakhesangs of Phek district
2. Paddy-cum-fish culture with most appropriate land and water management on the Hapoli flat land (Ziro) by Apatanis
3. Bamboo drip irrigation system in Jaintia Hills of Meghalaya
4. *Panikheti* of Angamis of Kohima district in Nagaland, Thankhuls of North Manipur and the people of Sikkim

The Zobo System

The system envisages a most appropriate utilisation of slope. On a hill slope profile, the top is left untouched with the forest, the middle segment is utilised for trapping silt brought from above in a siltation tank and a water harvesting tank at the lower concavity just above the paddy fields is followed by paddy field on the lowest segment of the slope and the river terraces. The water from the water tank is brought through bamboo pipes without causing any breach of dam built to hold the water in the water tank.

The Paddy-Cum-Fish Culture of the Apatanis

This is the well-known story of the *Apatanis* of Hapoli plateau, in lower Subansiri district around Ziro, the headquarters of the district. Located at a height of 1,500 m ASL, this remarkably flat area of 25 km^2 is surrounded by rising mountains on all sides. It is an intermontane basin, which is very intensely cultivated using the water of the hill streams and irrigating the rice fields by a series of well-designed channels. The Apatanis practise wet rice cultivation integrated with fish culture in the fields and grow finger millet on the bunds (Photo 16.3).

Bamboo Drip Irrigation System

It is a very useful system for water conservation, involving very little cost and using gravity to take the water from the higher areas to the fields. There is no leakage or loss on the way to the fields. It involves a network of bamboos, tubular or split, with different inclinations. This is useful only for a limited number of crops like betel vines and areca nut.

[3] For a better understanding, the reader is referred to Prasad and Sharma (1994).

Photo 16.3 Rice fields being made ready for the next rice crop in fields cultivated by Apatanis near Ziro, Lower Subansiri, Arunachal Pradesh (photo S. R. Jog)

Panikheti Rice Cultivation on Terraces

Locally known as *Panikheti*, the system consists of converting the lower segment of the hill slopes into terraces. The most cited example of this kind of farming is the terraced cultivation at 'Khonoma' village about 25 km from Kohima. These terraces are, sometimes, very narrow. Standing water is usually maintained in the fields. The farmers grow local varieties of rice, and the yields are usually low. The Angami Nagas who use this technique are equally adept in using the lower parts of the hill slopes for the cultivation of maize, millets, potatoes, chillies and pumpkins in the area. They develop natural manure in the soil by growing alder (*Alnus nepalensis*) on the sloping land between 1,000 and 2,000 m ASL. It is a non-leguminous plant, which fixes atmospheric nitrogen through nodules which develop on the roots. Besides being a source of nitrogen, alder wood is also used as firewood.

16.2.2.4 Increase in the Area of Bare Rocky Surfaces and Slopes

Despite the ingenuity of the hill people often observed in the practice of land utilisation, excessive destruction of vegetation on the slopes by felling and burning of trees has reduced many areas, even in a rainy climate to bare surfaces. This needs to be

Photo 16.4 Narrow valleys with alluvial plains supporting small settlements in the Himalayas

remedied. The bare rocky surfaces, wasteland and slope need to be covered with vegetation, commercial plantation, horticulture or even forage crops. Rocky wastes, in heavy rainfall areas, represent a misuse of land. What is needed is the development of a foolproof method of slope utilisation that could be used to determine an appropriate use of land on different slope facets in areas of different height with varying amount and intensity of cultivation (Photo 16.4).

16.3 The Present Day Agriculture in the North-East Region of India

The discussion, so far, centred around traditional agriculture as practised in the early twentieth century in the plains and hills of the North-East region. The situation has changed greatly during the last five or six decades. New crops have entered the area, irrigation sources have been tapped and the introduction of high-yielding variety of seeds, use of chemical fertilisers and improved technology have seen an increase not only in productivity but also in the expansion of agriculture in newly reclaimed areas. The change, however, is not uniform, yet can be witnessed, in a small or large measure, everywhere.

16.3.1 Progress in Agriculture in the North-Eastern Region in the Last 50 Years

After 1947, the year of India's independence, from the British rule, the North-Eastern region of India, principally Assam, underwent several territorial reorganisation resulting in the emergence of a number of new states. Since, newly emerged states did not attain statehood on the same date, every time a new state was formed, it affected the area and the outline of the neighbouring states. The result is that the economic data and particularly those related to land use vary widely from one year to another. This is particularly so in the case of Assam, as the three principal hilly states, viz. Meghalaya, Nagaland and Mizoram, were carved out of Assam, one after the other. This has also changed the profile of Assam. The state that was half plain and half hilly turned into one with 80 % of its area consisting of riverine plain and only 20 % occupied by hilly terrain. In relative terms, therefore, the land utilisation of Assam today is very different from what it was in 1951. As for the newly created hilly states, the land use has changed only marginally as a result of additional land brought under cultivation.

One can compare the land use of undivided Assam as it existed in the mid-twentieth century and the combined area of the North-Eastern states as they exist today, in terms of area and the percentage of land used for different purposes (Table 16.5) (Fig. 16.1).

Regional variations in land use are so wide that to speak of North-East region as a whole comprising eight states appears meaningless. The rationale for this comparison can be traced to the fact that Assam in 1957 was a much larger territory and included the present states of Meghalaya, Nagaland and Mizoram, though not Tripura and Manipur. Certain facts do emerge after comparison. To start with, the area under forests shows a remarkable increase, a fact that can be solely attributed to the inclusion of Arunachal Pradesh, with half the area under forest, in the North-Eastern region. In fact, only two-thirds of the area of Arunachal reports its land use, and much that is left out is either highly inaccessible covered with forests or under the impact of perpetual snow. Similarly, with the inclusion of Tripura and Manipur, the net sown area should have shown a larger percentage under cultivation, but the inclusion of Arunachal with hardly 3 % of its area under cultivation, the relative importance of net sown area in land use, remains suppressed at 17.36 %. A significant fact that emerges is the reduction in barren and uncultivated land, as there are less stony wastes in Arunachal Pradesh, and this large state adds a relatively small area in the category known as barren and uncultivated. The area under cultivation, the net sown area, has certainly increased and almost doubled from 21,673 km^2 for Assam in 1957 to 40,370 km^2 for the entire North-Eastern region in 2002. This increase is obviously the result of the cultivated areas of Manipur and Tripura that were excluded and did not form part of Assam. For the better understanding of regional variation in land use, state-wise land utilisation is presented in Table 16.6.

At a glance, one finds only 17–18 % of the area of the North-East region utilised for agriculture. Apparently, it is too little, but it reflects a compulsion imposed on

Table 16.5 Land utilisation in undivided as it existed in 1957 Assam and in the North-East region in 2002 (Area in km^2)

Land use category	Area in km^2 and as percentage of the reporting area	
	1957 (Assam)	2002 (NE region)
Total area (km^2)	120,502	262,179
Reporting area	120,502	232,530
Forests	44,477 (36.90 %)	119,910 (51.56 %)
Land put to non-agricultural uses	7,035 (5.84 %)	14,820 (6.37 %)
Barren and uncultivated land	38,769 (32.17 %)	32,290 (13.88 %)
Permanent pastures, grazing lands	1,659 (1.37 %)	2,590 (1.11 %)
Miscellaneous tree crops, groves not included in NSA	1,892 (1.57 %)	6,470 (2.78 %)
Cultivable waste	1,113 (0.92 %)	7,520 (3.23 %)
Fallow land	3,882 (3.22 5)	8,560 (3.68 %)
Net sown area	21,673 (17.98 %)	40,370 (17.36 %)

Sources:
1. The 1957 figures are taken from Government of Assam (1966–1967) (the original figures in acres are converted in km^2)
2. The figures for 2002 are based on table 150, p. 183, Basic Statistics of Northeast Region (2006)
Note: The North-East region of 2002 represents Assam as known in 1957, with the addition of Tripura, Manipur, Arunachal and Sikkim. Nagaland, Mizoram and Meghalaya were parts of Assam, in 1957

the region by terrain, characterised by an abundance of mountains, plateaux and forest-covered inaccessible areas. A more meaningful picture emerges when the land use of the region is evaluated state wise. The three main heads of land use that are most revealing are areas under forests, areas under cultivation and areas that are uncultivable or remain uncultivated for one reason or the other.

16.3.1.1 The Uncultivated Area

More than 31 % of the area of the North-East region remains uncultivated every year. This includes several categories like area put to non-agricultural use, barren and uncultivable area, cultivable wasteland or the land kept fallow. The most striking of these is the barren and cultivable wasteland. The mountainous terrain not covered with forests or cultivable wastes represents the uncultivated land. The two states that figure most prominently are Manipur and Meghalaya. Much of the hilly area surrounding Imphal plain remains a stony waste often devoid of forests, the latter accounting for only 27 % of the state's area. Thus, Manipur has two-thirds of its area uncultivated. Meghalaya, with 47 % uncultivated land, suffers from excessive fallow associated with *jhuming* besides a large chunk of territory, about 20 % that is classified as culturable waste. Granted that one-fifth of the area of the state is cultivable though not cultivated shows the inertia of local communities as of the administration of the state. Meghalaya is a plateau, and with some initiative, the area under cultivation could be increased as well as the overall agricultural production of the

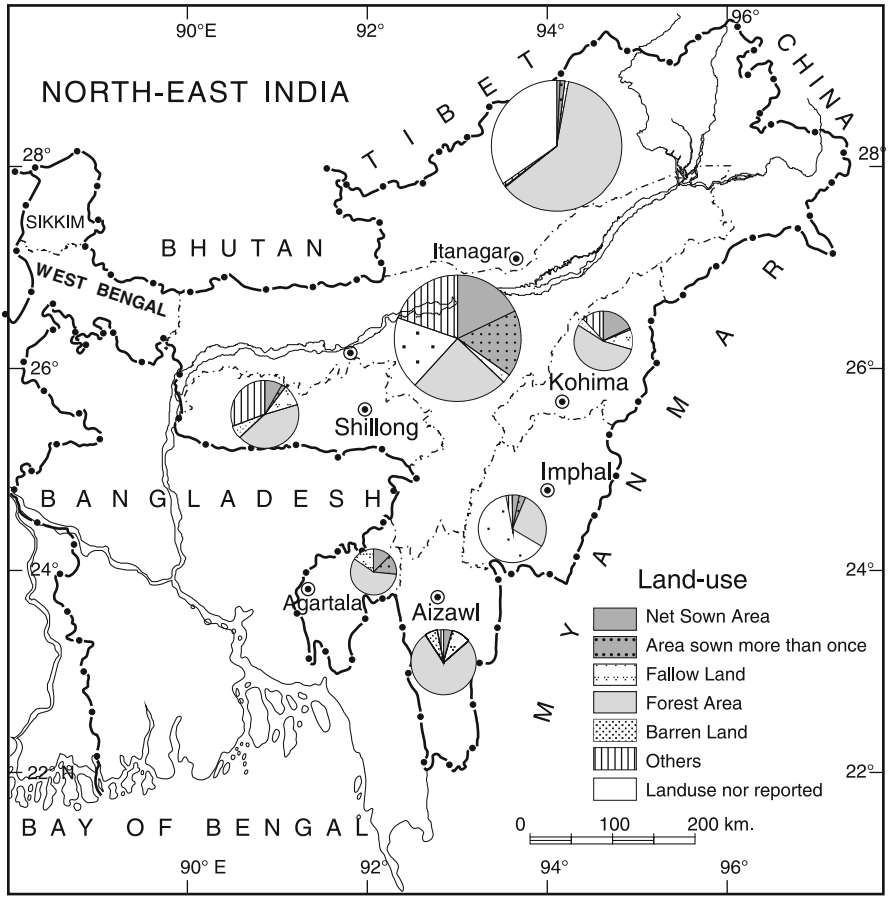

Fig. 16.1 Land utilisation (proportion of land under different land-use categories) in the states of North-East India

state. In other states, forest cover as in Arunachal Pradesh or cold conditions as in Sikkim are responsible for a low percentage of area under cultivation.

16.3.1.2 Area Under Cultivation

The area under cultivation is expressed, in most reports on agriculture, by net sown area (NSA), though the total cropped area may be larger, as part of the area under cultivation grows more than one crop a year, suggesting a more intense use of land. The North-East region of India, including all the states, has only 17–18 % of its area under cultivation (Fig. 16.2).

Assam with its riverine plains of Brahmaputra and Barak rivers has around 35 % of its area under cultivation, about half of which is cultivated more than once, thus

Table 16.6 State-wise land utilisation in the North-Eastern region (2006)

	Area of states under different categories in km^2							
	States							
Type of land use	Arunachal	Assam	Manipur	Meghalaya	Mizoram	Nagaland	Sikkim	Tripura
Total area	83,743	78,438	22,327	22,429	21.081	16,579	7,096	10,486
Reporting area	54,980	78,498	22,110	22,270	21.081	15,890	7,096	10,486
Area under forests	51,540 (93.70 %)	19,320 (24.63 %)	6,020 (27.20 %)	9,510 (42.70 %)	16,260 (77.13 %)	8,630 (54.30 %)	2,570 (36.20 %)	6,060 (57.80 %)
Net sown area	1,640 (2.98 %)	27,340 (34.85 %)	1,400 (6.33 %)	2,300 (10.23 %)	940 (4.45 %)	3,000 (18.87 %)	950 (13.38 %)	2,800 (26.70 %)
Land not under cultivation	1,800 (3.29 %)	31,830 (40.57 %)	14,690 (64,40 %)	14,690 (66.40 %)	3,890 (18.45 %)	4,260 (26.80 %)	3,580 (50.45 %)	1,640 (15.63 %)
Total	99.97 %	100.05 %	99.93 %	99.98 %	100.03 %	99.97 %	100.03 %	100.13 %
Area put to non- agricultural use	50 (0.09 %)	10,700 (13.6 %)	260 (1.16 %)	870 (3.87 %)	– NA	660 (3.9 %)	970 (13.6 %)	1,310 (12.5 %)
Barren and un-culturable land	210 (0.38 %)	14,610 (18.6 %)	14,190 (64.18 %)	1,360 (6.10 %)	160 (0.75 %)	–	1,730 (24.38 %)	30 (0.28 %)
Permanent pastures and other grazing land	40 (0.07 %)	1,630 (2.07 %)	–	–	230 (1.09 %)	–	690 (9.72 %)	–
Land under miscellaneous tree crops and groves	350 (0.63 %)	2,450 (3.12 %)	240 (1.08 %)	1,550 (6.96 %)	310 (1.47 %)	1,250 (7.86 %)	50 (0.70 %)	270 (2.57 %)

Cultivable waste	370 (0.67 %)	800 (1.02 %)	–	4,410 (19.80 %)	1,270 (6.02 %)	650 (4.97 %)	10 (0.14 %)	10 (0.10 %)
Fallow other than current fallow	470 (0.81 %)	650 (0.82 %)	–	1,620 (7.17 %)	1,560 (7.45 %)	790 (4.97 %)	90 (1.26 %)	10 (0.10 %)
Current fallow	300 (0.54 %)	1,100 (1.40 %)	–	650 (2.92 %)	360 (1.70 %)	910 (5.72 %)	40 (0.56 %)	10 (0.10 %)
Area sown more than once of the NSA	990 (60.38 %)	13,300 (48.60 %)	690 (49.28 %)	460 (20.00 %)	–	140 (4.60 %)	310 (32.60 %)	1,480 (52.80 %)

Source: Basic Statistics of North-East Region (2006); (a) absolute area in km^2, (b) as % of the reporting area (in brackets), in case the area sown more than once, the percentage refers to Net Sown Area

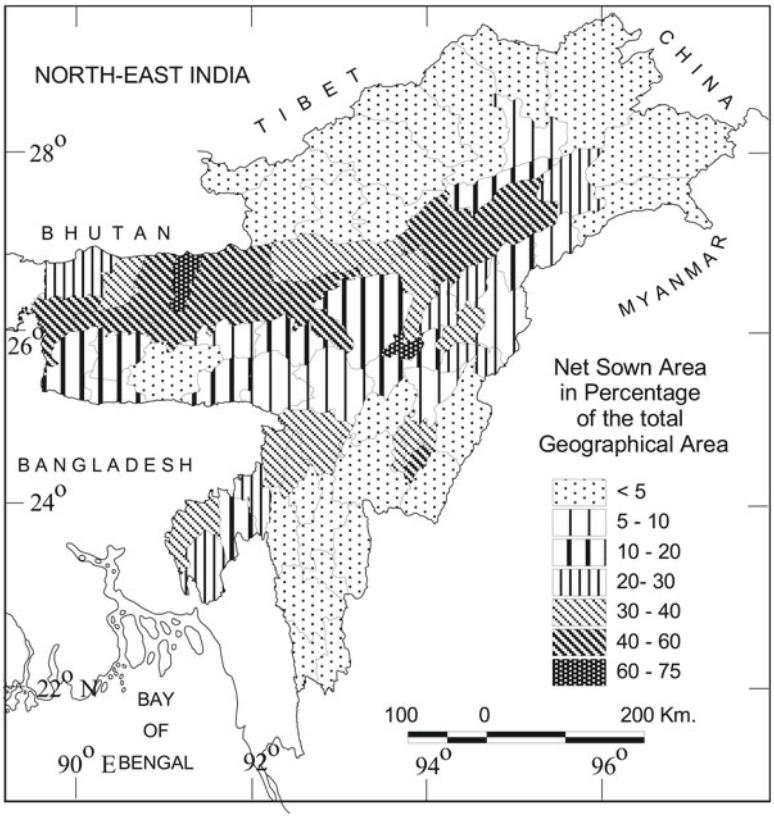

Fig. 16.2 Net sown area, in percentage of the total geographical area, in the states of North-East India

increasing the total cropped area by 50 % of the net sown area. Tripura comes second with 26.7 % of its area under cultivation. This is the western part of the state, which is the extension of the Bengal deltaic plain, rising eastward into the forest-covered low hills of Tertiary age. Nagaland with 19 % of its area under cultivation is the third state in the North-East region with more than 10 % of its area under cultivation. All other states have 10–20 % of their areas under cultivation. The vast area of Arunachal Pradesh does not have even 5 % of its area under cultivation.

16.3.2 Expansion of Agricultural Land

During the last three decades, most states of the North-East have demonstrated a positive change in their land use, bringing more land under cultivation. The increase is marginal in Meghalaya, non-existent in Manipur, substantial in Assam and Arunachal

Table 16.7 Change in land use in the North-Eastern states between 1972 and 2001

States	Year 1971–1972		Year 2000–2001		Change between 1972 and 2001
	Area in 1,000 ha	% of geographical area	Area in 1,000 ha	% of geographical area	
Arunachal	115	2.03	164	2.98	+42.60 %
Assam	2,235	28.60	2,704	34.85	+21.00 %
Manipur	140	6.33	140	6.33	+0.00 %
Meghalaya	162	7.22	230	10.32	+42.00 %
Mizoram	41	1.90	94	4.45	+129.20 %
Nagaland	102	6.17	300	18.87	+194.00 %
Tripura	241	22.90	280	26.70	+ 61.00 %

1. Figures for 1971–1972 are taken from Basic Statistics of Northeast Region (1977:38)
2. Figures for 2000–2001 are taken from Basic Statistics of Northeast Region (mimeographed) (2006)

Table 16.8 Net sown area in Tripura

Year	Area in hectares	Change (%)
1937	124,975	
1955	194,654	+55.75
1965	231,009	+18.60
2002	280,000	+21.20

Source: Figures for 1937, 1955 and 1965 are taken from Tripura District Gazetteer 1975, Govt. of Tripura. For 2002 the NSA is taken from same Basic Statistics of Tripura, p. 15. Govt. of Tripura

and very large in Nagaland and Mizoram. A comparison of the area under cultivation for different states in 1971–1972 with that of 2000–2001 shows the largest increase in Meghalaya followed by Mizoram and Tripura (Table 16.7).

By all accounts, the land use in Nagaland is unrecognisably transformed during the last couple of decades. The net sown area of the state jumped from 1,575 km^2 in 1980 to 3,127 km^2 in 2002, a rise of almost 100 %. Also, a great increase in the land under orchards is seen in Nagaland. This has been achieved with a simultaneous threefold increase in the area under forests and a drastic reduction in long fallow resulting from shifting cultivation. Assam also shows a remarkable decrease in the area under long fallow resulting from *jhuming*. There is not much change in Manipur. Tripura is a state apart. No state in the North-East has shown such a drastic change in its land use as Tripura (Table 16.8). During the last hundred years, the net sown area in Tripura has increased from 1,249 to 2,800 km^2. This has been achieved by successive ruling regimes. As a princely state, Tripura had only 12 % of its area under cultivation, but it grew in every decade. Between 1937 and 2002, the cultivated area of the state increased by 125 %

The enormous increase in the cultivated area in Tripura is a story of the enterprise of the people who migrated from Bengal and brought new technology. The reclamation of marshy land for agriculture was undertaken largely by the immigrant population

Table 16.9 Intensity of agriculture expressed by gross cropped area/net sown area

States	Net sown area in 1,000 ha	Gross cropped area in 1,000 ha	Intensity of agricultural land use: Gross cropped area / Net sown area
Arunachal P.	166	264	1.6
Assam	2,701	4,093	1.5
Manipur	140	199	1.42
Meghalaya	240	266	1.1
Mizoram	91	91	1.0
Nagaland	261	295	1.13
Sikkim	95	121	1.27
Tripura	277	420	1.51

Calculated from the (*NSA*) Net Sown Area and (*GCA*) Gross Cropped Area of the Basic Statistics of North-East Region (2006)

even before the partition of India in 1947, but the flow of migrants turned into a tide after the partition of Bengal in 1947, which brought a huge influx of refugees whose occupation was agriculture. To accommodate the migrants, marshes were reclaimed, wastelands were utilised and agriculture was extended toward the hills. Even the *tillas*, the low hills, were put under plantation. The influx of people from Bengal and the reclamation of land to obtain more agricultural land is a story of human enterprise, yet it injected into Tripura society an element of conflict, as soon there developed a clash of interests and competition for the state's resources, between the indigenous population and the immigrants.

16.3.2.1 Intensity of Agricultural Land Use

Intensity of agricultural land use is usually measured by the ratios between gross cropped area and the net sown area (Table 16.9). Obviously, part of the fertile land or the land enjoying the benefit of irrigation is sown more than once and increases the total cropped area in a year. This depends, besides the fertility of soil and moisture availability, over a longer period caused by moisture retentivity of the soil, a dispersed nature of rainfall or some kind of irrigation, on the sagacity of farmers to design his cropping pattern in such a way as to enable him to harvest several crops during the year.

Intensity of land use has to be distinguished from intensity of cultivation. While the former is meant to suggest the frequency of cropping in a year, the latter term takes into account the input in agriculture that enhances productivity. What appears here is the fact that the states, with alluvial terrain and a large percentage of area under rice, show higher intensity of agricultural land use. The case of Arunachal is explained by the fact that not even 3 % of its area is under 'cultivated' and the land

Table 16.10 Relative importance of different crops in the total cropped area

Crops	Area in km^2	% of geographical area	% of total cropped area
Total geographical area of the region	263,179		
Net sown area of the region	40,370	15.40	
Total cropped area (including multiple cropping)	57,760	22.00	100.00
A. Total food grain crops	38,980	100.00	**67.48**
(a) Rice	33,950	87.00	58.70
(b) Maize	1,730	4.43	3.00
(c) Wheat	870	2.48	1.67
(d) Small millets	440	1.12	0.76
(e) Pulses	1,770	4.54	3.06
B. Oilseeds	4,150	% of area under total oilseeds	**7.18**
(a) Mustard and rapeseeds	3,170	76.38	5.48
(b) Linseed	180	4.33	0.31
(c) Sesamum	260	6.26	0.45
(d) Groundnut	30	1.00	Insignificant
(e) Castor seeds	20	0.50	Insignificant
Other oilseeds	490	11.80	11.80
C. Other crops	14,630		**25.3**

Source: Basic Statistics of NER (North-East Region) (2006:183–200)

that is reported under 'cultivated' consists of the flat patches like the area around Pasighat or Ziro in Subansiri district, where several crops are grown during the year with irrigation.

16.4 Crops and Cropping Pattern

Agriculture is more often typified by the crops grown in a region. North-East India is essentially a rice province. Rice gets primacy over all other crops. Some other food crops also enter into crop combination to take care of the need of proteins, oils and fats. Besides, some cash crops like cotton and commercial plantations like tea and rubber are also grown in the region (Table 16.10). Thus, the cropping pattern of the region is dominated by food crops, largely consisting of cereals, pulses and oil seeds. The cereal crops are dominated by rice, followed by maize and millets and some wheat; oilseeds consist of rapeseed and mustard besides sesame, and the pulses include *tur* (*Cajanus indicus*) and lentils. In areas where food grains are not grown, either because of being displaced by commercial plantations or restricted by physical constraints of relief, temperature and soil, plantations take over. These consist of pineapple, areca nut, banana, coconut, *litchis* and citrus fruits. Some fruit

trees like apple and kiwi in Arunachal Pradesh and passion fruits in Nagaland have been newly introduced. Besides these, the most important commercial plantation of the region is tea and rubber, the former mainly in Assam and Tripura and the latter confined, so far, solely to Tripura.

16.4.1 Food Crops

Over two-thirds of the cropped area of the region is occupied by food crops. The relative importance of food crops varies from one state to another. There are states like Manipur and Nagaland, which have concentrated excessively on food crops where in each case about 85 % of the cultivated area is devoted to food crops. The areas of moderately high concentration of food crops are Assam, Sikkim and Tripura, where, besides food crops, oilseeds, fibre and plantation crops are grown in large areas. Meghalaya is an exceptional case of low concentration of food crops. This is a response to the terrain condition of the plateau, climate, height and the viability of different horticultural crops which seem to thrive well on the plateau and offer good economic returns.

16.4.1.1 Principal Crops of the Region

Rice

Rice is the staple food and principal crop of the region and accounts for 68 % of the total cropped area and 87 % of the area under food crops. Its dominance can be gauged from the acreage of rapeseed and mustard, the second important crop of the region, occupying only 5.5 % of the total cropped area. The three crops that define the agricultural landscape of the region are rice, the principal cereal (87 %); oilseeds dominated by mustard (10 %); and pulses (5.5 %). Of these, rice is universal and the first choice of the farmers (Photo 16.5).

In traditional agricultural economy, the crop was so important that writing in mid-nineteenth century, Robinson (1841) considered rice as ‘the staff of life that takes lead among the objects of cultivation’. It is an indigenous plant of the North-East, and this region is one of the centres of origin of rice. As such, there is a large diversity of genetic material including wild varieties of rice. About 7,000 varieties of cultivated rice have been so far collected from the region. The studies also indicate that genes having many desirable characteristics including resistance to pests and diseases, different plant heights and high protein content are available in different rice varieties from the region. As such, the collection from this region has been utilised in the rice improvement programme not only in the country but even abroad (Borthakur 1992).

Another important characteristic of rice in the region is its cultivation in a large altitudinal range, from sea level to 1,500 m ASL. A wide genetic variation has

Photo 16.5 Paddy fields as they appear in April in Tripura, 20 km south of Agartala

made it possible to choose the best-suited variety for different relief and climatic conditions. Equally important is the fact that rice grows all through the year depending on the variety to suit different terrain conditions.

Varieties of Rice

A non-genetic variation rests on the mode of cultivation and the season of growing and harvest. Thus, there are autumn, winter and summer rice, known by different local names in different areas. There are three seasonal varieties, besides two other minor varieties to suit terrain conditions.

Varieties of Rice

1. *Autumn Rice*

Local name in Assam	Local name in Tripura
Ahu	*Aus*

(a) Lowland *Ahu* often grown in *chaparis* in conjunction with mustard
(b) Highland *Ahu* – Piedmont zone of the Himalayan Mountain

The growing period for *Ahu* is March–April to June till August. In *chapari* or *char* land (river islands), *Ahu* plants can survive under floodwater for as long as

a week, a longer submergence under floods destroys the plants. In highland *Ahu* in the piedmont zone, the crop is repeated after 1 or 2 years of fallow.

2. *Winter Rice*

   (a) *Sali* – known as *Aman* in Tripura
   (b) *Bao* – Deep water rice

   Sali is the most important and common variety of rice in the region. The growing period for *Sali* is July–August to November–December. In Cachar it is known as Sail. *Bao*, a kind of winter rice, is grown in March and April and harvested in November–December. Sown broadcast, it is a kind of floating rice with high yield.

3. *Summer Rice*

   Boro in Assam – *Bodo* in Tripura

The growing period of *Boro* is November–December to April–May. It grows in areas with stagnant water, marshy land or in lowland areas with irrigation facilities. Another variety of winter rice is *Asra*, growing in shallow water with huge yield. Besides, there are several varieties of hill rice depending upon the local situations. At altitudes below 1,000 m ASL, hill rice is grown in April–May and harvested in September–October, but at higher altitudes sowing is done in June–July, and harvesting is in November–December. A large part of hill rice is grown as a principal food crop in *jhum* cultivation. Improved varieties have been lately introduced in many areas. The summer rice grows at low altitudes in the plains of Assam, Tripura and in Imphal valley. All these areas have either low-lying marshy land utilised in late winter or have irrigation facilities. The yields of summer rice are the highest, as it enjoys a long period of sunshine with assured moisture, while the autumn rice has the lowest yield.

16.4.1.2 Area, Production and Yield of Rice in Different States of the North-East

Roughly 3.4 million hectares or 34,000 km^2 of land is devoted to rice in the North-Eastern states, which is 84 % of the net sown area of the region and about 60 % of the total cropped area (Table 16.11).

The areas with least diversified agriculture depending largely on rice are Manipur, Assam and Tripura. All these states have plain areas with some irrigation facilities and rely heavily on rice, the best-suited crop with maximum return. In contrast, the hilly areas have, on an average, half the cultivated land under rice.

Agriculture, particularly cropping pattern, is more diversified in the hilly areas with maize, millet, pulses and oilseeds claiming a significant share. This could be partly ascribed to the unsuitability of terrain in areas where growing rice is not feasible. The prevalence of shifting cultivation in which a mixed culture with a variety of crops are routinely practised and the traditional food habit of the hill tribes are other reasons that have kept crop diversity, a contrast, with the rice monoculture of the

Table 16.11 Production and yield of rice in different states of the North-East region

States	Area (000 ha) under rice including multiple cropping	Production (000 metric tons)	Yield in kg/ha	% area under rice of the NSA
Arunachal P.	125	153	1,224	76.20
Assam	2,541	3,738	1,471	93.00
Manipur	159	378	2,377	113.40
Meghalaya	106	182	1,717	46.00
Mizoram	57	109	1,912	57.40
Nagaland	151	225	1,490	50.30
Sikkim	16	22	1,375	16.80
Tripura	240	543	2,262	85.70
NE region	3,395	5,350	1,575	84.00

Note: Figures in the above statement are based on Basic Statistics of NER 2006 and do not always conform to the statistics published by the states

plains, alive. Manipur with its fertile Imphal plain demonstrates a case of monoculture whereas Nagaland with its requirement of maize, pulses and oilseeds has a very diversified cropping pattern and uses a balanced crop combination. The productivity of rice in Manipur, with the highest yield in the entire North-East region, is reason enough for the regional population to opt for a near monoculture of rice.

The yield of rice for the region, 1,575 kg/ha as a whole, is much below the national average of 1,800 kg/ha, with the exceptions of Manipur and Tripura which have rice yield of 2,378 kg/ha and 2,262 kg/ha, respectively. Both these states have concentrated excessively on rice, virtually ignoring all other food crops. The Imphal plain with its southern extension into Bishnupur and Thoubal has the benefit of irrigation and a high intensity of land use. Known as the rice bowl of the state, it enjoys a temperature higher than the other hilly states and also a longer period of sunshine. Even the hilly districts of Senapati, Ukhrul and Chandel have the benefit of irrigation from canals and hill streams. The Manipuris have tended the area well, using better seeds and fertilisers to keep the rice production at a peak level. In case of Tripura, the low-lying land in the western Tripura that produces much of the rice is also the land of the immigrant Bengali farmers who have introduced intensive cultivation adopting all possible innovations to enhance the productivity of land in general and the yield of rice in particular.

Assam, with three-fourths of the total rice area in the North-East region, shows much lower yield of a meagre 1,471 kg/ha. The low rice yield in Assam is ascribed partly to its varietal composition. Around 20 % of the total rice is the autumn rice with almost one-third of the yield of summer rice and 40 % of the yield of winter rice. The *Sali* or winter rice has a better yield, though not as high as summer rice, but is often subjected to the vagaries of weather and the fury of Brahmaputra flood particularly during early growth period of July to August. Added to this is the fact that irrigation is available to only 2.7 % of the total area, quite inadequate to ensure better growth and higher yield of rice.

Photo 16.6 Typical landscape of Tripura: Tilla (high ground) Lunga (low ground) juxtaposed to each other. Tilla is covered with rubber plantation, and Lunga is used for rice cultivation

Tripura has a very high intensity of land use. The ratio of gross cropped area to net sown area is 2.3 (Photo 16.6). It is clear that irrigation plays a very important role in the agriculture of the region. Some 70,000 ha of land are irrigated in Tripura, largely in the plains of West and South Tripura that cover the lower alluvial tract of Gumti, Haora and Manu rivers. In the western part the state, both level of irrigation and productivity are higher than the average of the state. This also accounts for a higher yield of rice and the near absence of crops like maize so common in the hilly areas.

Rapeseed, Mustard and Other Oilseeds

Next to rice, the most important crop of the region is rapeseed and mustard. Though not counted among the food crops, mustard is the most common oilseed grown in Assam and Nagaland and is the second most important crop in these two states. Besides, Arunachal has a substantial acreage under mustard. The crop does not require a very fertile land and being hardy can even endure moisture stress. The yields are low and linger around 500 kg/ha. The importance of mustard lies in its being a traditional source of fat in Assam plains where milk culture was not developed for a long time. In the hilly areas, rapeseed and mustard are often grown to utilise the infertile land, not suitable for other purposes.

Maize

A late entrant in the agricultural complex of the region, the crop has become very important in the hilly peripheral states. It is grown either with other crops in the mixed culture of *jhum* cultivation or singly. A food crop for the people, maize is also used as a 'feed' for pigs in the region. Among the cereals, maize, with 5 % of the net sown area, is the second largest crop next only to rice. Till the beginning of the twentieth century, maize was a marginal crop, grown occasionally in homesteads or some grains were sown in the *jhum* field. Gradually, the crop has replaced small millets, consisting largely of ragi (*Eleusine coracana*) and foxtail millet both of which have shrunk in acreage and are on the verge of being abandoned. Within similar climatic conditions, maize returns a much higher yield and is consumed in a variety of ways. Maize is an important crop in Arunachal Pradesh and Nagaland where the crop claims more than 15 % of the area under cultivation and is still in an expansion phase. Meghalaya has also around 8 % of the area under maize though the acreage under maize is gradually shrinking. It is the least important crop in the plains of Assam, Manipur and Tripura. For Sikkim**,** maize is a premium crop accounting for 60 % of the cropped area under cereals and more than half of the area under food crops including pulses. This shows the versatility of the crop and its adaptation to a wide range of physical and climatic conditions, spreading in the hilly regions of Arunachal, Nagaland and Sikkim.

Millets

The North-East region of India, as much as any other tribal region of the country, is known for growing small millets, in conjunction with rice particularly in *jhum* areas. Now, it is confined to hilly areas of Assam, mainly North Cachar Hills, and Nagaland. The main varieties of small millets are *ragi* (*Eleusine coracana*), *vari* or *varai* (*Panicum miliaceum*) and *kodon* or *kodo* millet (*Paspalum scrobiculatum*). Foxtail (*Setaria italica* or *Panicum italicum* L.), a very inferior millet with fine grains and sticking hair exterior, is confined to small hill pockets like West Garo Hills. The importance of millets in the agricultural economy of the North-East is dwindled to the extent of being unnoticeable.

Wheat

An insignificant crop, in the larger context of the North-East region, attains importance in certain pockets. The crop was grown in small patches by immigrants from upper India, and the total area in Assam in 1902–1903 was only 14 acres. It got momentum during the last century, and today, 70,000 ha land in Assam is devoted to wheat and is the second most important cereal crop in the state. It has spread to neighbouring states of Meghalaya and Nagaland, though the area under wheat is

limited. There are certain pockets in the region where wheat is a pre-eminent crop. In Arunachal, wheat is grown in every district barring Upper Siang and Dibang valley. The western part of Arunachal, especially Tawang region, has a dominance of wheat in its cropping pattern and accounts for over 40 % of the total cropped area. It has a yield of 1,450 kg/ha, and though so much below the national average, it adequately fulfils the requirement of the local population. Low temperatures keep evaporation level low and the soil moisture in the soil moisture storage level during the rainy season lasts long enough to permit a moderate crop yield. Even at 2,500–3,000 m ASL, the crop grows well where rice and millet are confined to a few relief niches.

Other Crops

This group includes sugarcane, fibre crops like jute and mesta *(Hibiscus cannabinus* and *H. sabdariffa*) and cotton, root crops like potatoes and condiments like turmeric, ginger and chillies, besides some tobacco in Assam and Meghalaya. Jute is confined to Arunachal Pradesh, Assam, Tripura and Meghalaya, though its importance is fast declining. Assam is the largest producer of jute in the region, with small patches in Meghalaya and Tripura. Meghalaya has a near monopoly of cotton in the region. Grown exclusively in Garo Hill areas of Meghalaya, the crop is grown in *jhum* field with other crops as an element in mixed culture. The yield is comparable to the Indian average around 200 bales per hectare. For Meghalaya, it is a cash crop supplementing the tribal economy. Small areas of sugarcane are seen in Assam, Sikkim and other states of the region. The sugarcane grown in Dhansiri valley is crushed and processed locally to produce sugar in a factory at Dimapur.

Potatoes

One of the important root crops that meets partially the food requirement of the region was introduced for the first time by David Scott, an agent of the East India Company in the North-East region, in 1830, in Khasi Hills. And it was propagated elsewhere later on. Now grown in all the states of the North-East, it occupies approximately an area of 120,000 ha, much of it in Assam, Meghalaya and Tripura. While it is grown in plains, as an irrigated crop in Assam and Tripura, it grows in the valleys and hill slopes on Meghalaya plateau without irrigation. It is a winter crop, but in the hilly areas above 1,500 m ASL, it grows in spring. In Meghalaya, potato is grown in March–April relaying on occasional shower and ground moisture. This is locally known as *boon* system. A very high yield is often counterbalanced by adverse impact of plant diseases and blight. The Central Potato Research Institute at Shillong has developed pest-resistant and high-yielding varieties of potatoes, of which *Kufri jyoti* is most successful, giving a yield of 200 quintals of potatoes per hectare. While potato cultivation is ubiquitous in

Assam, in Meghalaya it is concentrated in East and West Khasi Hills district. In Nagaland, potato cultivation is almost uniformly distributed in all the districts. The higher altitudes in Arunachal Pradesh are all well suited to grow potatoes, but Tawang in western Arunachal and Lohit and East Siang in the eastern part have taken to potato cultivation in a big way.

Condiments and Spices

Ginger and turmeric are the two root crops, used as spices that grow well in the region. Besides, Assam, Mizoram and Meghalaya produce ginger. The crop is diffused to Arunachal and Manipur, and about 30,000 ha of land is put under ginger every year, of which Meghalaya and Mizoram each accounts for over 25 %. The quality of ginger though much appreciated in Indian household is not very suitable for export because of high fibre content and is consumed as green ginger.

Pulses

A large variety of pulses, led by *arhar* or *tur* (*Cajanus indicus*, pigeon pea) is grown in different parts of the region. One may mention *tur* or *arhar* (*Cajanus indicus*), *matar* or peas (*Pisum sativum*), *chana* or gram (*Cicer arietinum*), *mung* or green gram *(Phaseolus radiatus* now *Vigna radiatus*), *udid* known in Assam as *Mali kalai* or black gram (*Phaseolus mungo*, now *Vigna mungo*) and *masur* or lentils (*Lens esculata, Lens culinaris*) as the main pulses. All these grow in the region though their significance may vary. Besides Assam, which has 3–4 % of its cultivated land under various kinds of pulses, Nagaland also grows a variety of pulses that add up to 14 % of the total area under food crops. In other states, pulses form less than 3 % of the cropped land.

16.4.1.3 Cropping Pattern

The cropping pattern of the region is governed by the physical conditions suitable for crops, the yield of different crops and the need of the local population. One may group the food crops in three categories: cereals giving caloric energy, pulses fulfilling protein requirement of the people and the oilseeds that supply fat and the fatty acid in food. Ideally, every sub-region – here the states – should have a balanced crop combination to meet the requirement of basic calories, proteins, fats and salt and minerals of the diet, yet a higher yield of rice often creates a situation that leads to veritable monoculture, as in the case of Manipur and Tripura. In contrast to these plain regions, the hilly states of Arunachal, Nagaland and to some extent even Meghalaya and Mizoram have developed a more diversified agriculture where pulses and oilseeds also figure prominently. Assam has a well-developed system of agriculture and has a well-established system of growing pulses and oilseeds, the

Table 16.12 Yield of rice in Assam 2005–2006 in kg/ha

	Area (000 ha)	Production (000 tons)	Average yield kg/ha
Autumn rice	398	398	1,017
Winter rice	1,707	2,504	1,543
Summer rice	315	561	1,780
Total	2,420	3,553	1,487

Source: Government of Assam, Economic Survey in 2006–2007, Directorate of Economics, Guwahati

latter occupying more than twice the acreage of pulses of the state. The hill states practise *jhuming*, one of the oldest systems of farming, known for mixed culture. Traditionally, the hill people have been growing oilseeds, pulses, spices, vegetables and even cotton in the same field where they grow rice. The practice still continues in a modified form, and the pulses and the oilseeds remain important crops in the hill areas.

16.4.1.4 Agricultural Productivity

Judged by the yields, there is no marked difference between crop yields of the constituent states of the region and the mean for India as a whole. However, crop yields have not attained an optimal level comparable with the best yields in the country. Rice, the dominant crop of the region, has an average yield of 1,575 kg/ha for the region compared to over 1,800 kg/ha for the country. Inside the region, there are extremes like Manipur and Tripura having a very high yield. Assam and the hilly areas subjected to a variety of terrain conditions have much lower yields (Table 16.12). A large acreage under autumn rice having low yield distorts the average yield. The summer rice, on the other hand, with a high yield, should compensate for the lower yield of autumn and winter rice, but it has very small acreage. Usually, the areas enjoying benefit of irrigation show higher yield. Thus in Assam valley, Nagaon, Barpeta, Darrang and Sonitpur have large areas under irrigation and show higher yield. The introduction of high-yielding variety of rice in more than half the rice growing area of the state has increased productivity. But despite all the measures, the overall yield of rice in Assam remains low.

Agricultural productivity depends, above all, on irrigation and partly on high-yielding variety of crop and the use of fertilisers. The central district of Assam plain including Nagaon, Kamrup, Sonitpur, Darrang and Barpeta appears to be the areas of better productivity attributed largely to the application of seed-fertiliser technology (Singh and Daimari 2003). Relative immunity from the high floods like those in Brahmaputra plain and intensive agriculture have enhanced agricultural productivity in Imphal plain and western Tripura. While Manipur and Tripura lead in the rice yield, Nagaland shows the highest yield of maize and small millets and even wheat, though the average of the last crop is yet very small, and the state also has a higher yield of rapeseed and mustard.

16.4.2 Plantation Agriculture

Plantation may be defined as a large-scale organised cultivation of shrubs and trees for fruits, fibres, spices and even for commercial purposes. The most common crops in the region include the following categories:

1. Beverage	Tea
2. Fruits	Banana, pineapple, citrus fruits, cashew nut, *litchi*, coconut and temperate latitude fruits like apple, pear, plum and peaches
3. Other commercial plantations	Areca nut and rubber

16.4.2.1 Tea

Tea is the earliest and most important plantation crop of the area. The development of tea plantations based on the indigenous tea plant with a large number of tea gardens, tea processing units and trading centres during the nineteenth century is the sordid story of an exploitative colonial enterprise promoted during the British rule. Plantation companies were offered land on very favourable terms. They owned 642,000 acres of land in 1901 that was roughly one-fourth of the total settled area of Assam (Guha 1979). Of this 55 % was revenue rent-free and the remaining carried a concessional rent. The tea planters had all the concessions they asked for and within a short period, with booming tea trade, became phenomenally rich. Thus, evolved an aristocracy of tea planters, with all the power and privileges, aptly described by Guha in *From Planters Raj to Swaraj*.

The original British tea planters, unable to live in a democratic India, without the privileges and the protection enjoyed during the British rule sold their companies to Indian companies. The tea plantation companies exist as they were before 1947 but without the planters with their stylish living, detached from the local peasantry. Today, with over 40,000 tea estates, small and big, the region accounts for more than half the area under tea plantation in the country and produces 53 % of the total production of tea (Table 16.13).

Though every state in the region has some tea gardens, Assam is the principal contributor followed by Tripura. Production of tea in other states is notional with farmers growing some tea or some small tea estates developed to supply tea leaves to major integrated units consisting of tea estates, processing, packaging and marketing units.

A Brief History of Tea in Assam

Tea, a most popular international beverage, is believed to have its origin in China where it was possibly cultivated as far back as 2,700 BC (Borthakur 1992). Tea plant, growing wild, was first discovered by Robert Bruce in upper Assam in 1821.

Table 16.13 Tea estates and production of tea in the North-East region

States	Number of tea estates (1999)	Area of tea estates in hectares (2002)	Production of tea in tons (2002)	Percent of tea area in the region	Percent of production in the region
Arunachal	42	2,250	950	0.79	0.21
Assam	30,940	270,163	432,511	95.80	98.23
Manipur	27	950	98	0.33	0.02
Meghalaya	13	370	135	0.13	0.03
Mizoram	9	NA	NA	–	–
Nagaland	72	1,270	40	0.45	0.01
Sikkim	NA	300	100	0.10	0.02
Tripura	271	6,700	6,430	2.20	1.46
Total	31,374	282,003	4,40,264	99.78	99.98

Source: Basic Statistics in North-East Region (2006, table 192 – Tea Statistics, p. 230)

Later, it was ascertained that this tea plant was indigenous to Assam and could be cultivated there commercially. Indigenous tea was also discovered in Cachar. By the end of the nineteenth century, four distinct varieties of wild tea were recognised in North-East India. These were:

1. Assam indigenous with a leave length of more than 15 cm
2. Manipur or Burma indigenous with a larger darker and coarser leaf
3. Lushai or Cachar indigenous with a mature leaf length of 30 cm
4. Naga indigenous with a long but narrow leaf

The first tea garden was opened in Assam in 1835 at Lakhimpur. Companies for planting and processing of tea started appearing in 1839, and in 1840, the government of the day handed over the experimental establishment to Assam Tea Company, which produced 280,000 lbs. of tea in 1851. The number of gardens multiplied in Darrang and Sonitpur districts on the northern bank of Brahmaputra, and many companies appeared with their tea estates in the districts south of Brahmaputra.

In the beginning of the twentieth century, there were 764 tea gardens producing 145,000,000 lbs of tea and employing 410,000 people of which around 1,000 were Europeans. The cultivation of tea gradually spread to other parts of Assam, particularly Cachar in Barak valley where also wild tea plant was discovered. Export of tea brought rich dividends to tea planters and their number steadily increased. More and more tea companies were formed, most of these registered in England, and the number of tea estates multiplied. About four-fifths of the capital employed by the companies was owned by those, whose head offices were located in England.

Environmental Conditions for the Growth of Tea

Tea grows in an area ranging from 50 to 2,000 m above sea level. The rainfall requirement of tea plants is rather heavy ranging from a minimum of 1,500 to 4,000 mm. More than the amount of rainfall, its seasonal distribution is

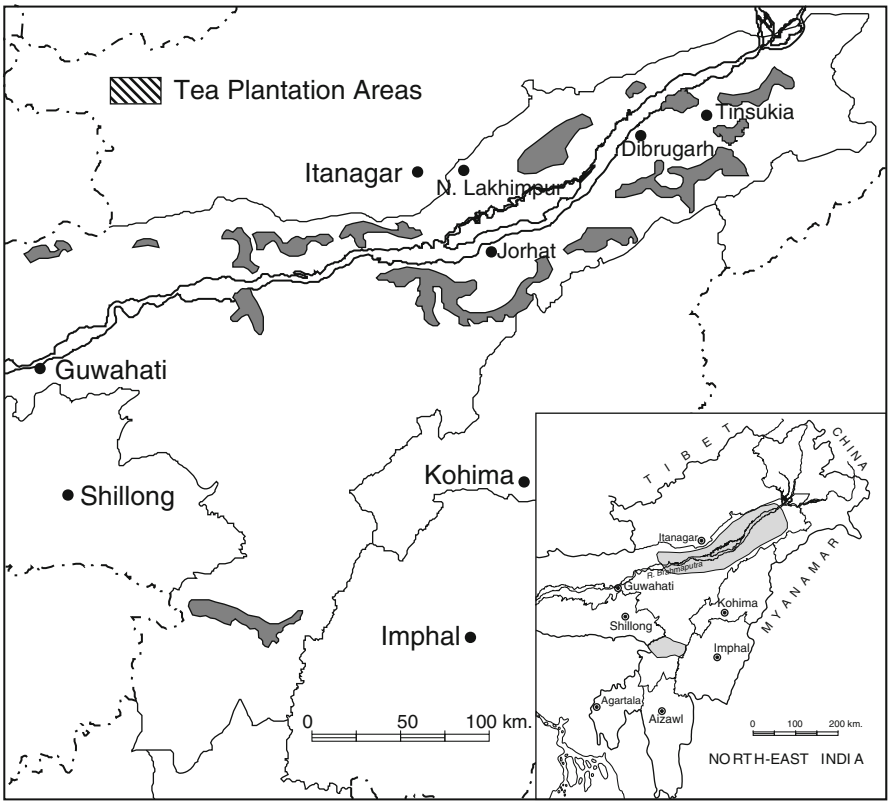

Fig. 16.3 Tea plantation areas in Assam

significant. A long period of drought not only leads to the lowering of yield but also may even cause some disease. A moist atmosphere with occasional showers is ideal. During long summers, sprinklers are used to keep the tea bushes healthy. Ideally, tea needs sandy loam with a moderately acidic reaction, typical of reddish soils. Extremes of texture are harmful. Both a heavy clay, not allowing sufficient water to pass through, and a very sandy soil that permits free drainage requiring frequent water are not suitable for tea and are avoided. A slightly rolling land is ideal. Tea is also a shade-loving plant and develops well under light shade than under fully exposed conditions. The yield of tea is generally higher at lower levels than at higher altitudes, though the quality of higher altitude tea is usually considered better.

Tea tracts of Assam lie on either side of Brahmaputra largely in upper Assam, in the flood-free zone just down the piedmont slopes, without encroaching on the fertile rice fields. Physical conditions of terrain are so important that even the labour productivity is largely determined by them (Singh and Daimari 2003) (Fig. 16.3).

Table 16.14 Number of gardens, their area and production of tea in Assam

Year	Number of gardens in Assam	Area under tea gardens in hectares	Productivity of tea in million kg	Labour employed	Yield of tea
1903	764		145 million lbs.		445 lbs/acre
1951	785	155,674	150.37	NA	966 kg/ha
1961	744	162,367	182.30	NA	1,123 “
1971	750	182,325	223.62	397,370	1,227 “
1981	777	203,038	305.10	458,494	1,503 “
1991	848	233,284	396.60	541,661	1,685 “
2001	40,795[a]	269,154	453.50	–	1,685 “

[a]Includes all tea growers, the number of tea estates even in 1997 was only 860

An important element in tea industry has always been the labour supply, as planting, pruning of tea bushes and plucking tealeaves are all labour intensive processes. This was a problem faced by the tea companies in Assam. As recorded in the Imperial Gazetteer in 1903, ‘the want of labour has always been one of the most serious obstacles to the development of the industry. The mass of the population of the province are above the necessity of working for wages, and nearly all the coolies employed on the plantations have to be imported from other parts of India.’ Not that the labour from other provinces was keen to migrate, but they were induced by the offer that included, besides the wages, assured accommodation, good water supply and medical treatment. The result was that by the beginning of the twentieth century, more than half a million labour arrived from U. P., Bihar, Orissa, Jharkhand, Bengal and other parts of the country. Many of the migrants became permanent settlers in due course, and their descendants, not all employed in tea estates, reclaimed new land and developed farming of the type they were used to. A large number took other professions and became part of Assam’s population, though they could not be assimilated in the Assamese society, which distinguishes itself by its cultural ethos, very different from those of the migrants, and the family names they have carried over the generations.

The growth of the tea industry can be judged from Table 16.14.

With increase in demand for tea, a large number of small tea growers have emerged as a class, their number rising to 270,683 in 2003. These small tea growers have added only insignificantly to the quantum of tea produced in the state, but by growing a patch of tea, they have been able to mend their own domestic finances. Their income from tea is limited, as besides developing only a small tea garden, they have been unable to develop processing units that are an important source of income.

Though all the states in the North-Eastern region grow some tea, it is often consumed locally. The cultivation of tea in those states, except Tripura, is indifferent and yield pathetically low, and tea production does not count for much in the commercial tea enterprise. Tripura has over 6,000 ha under tea and produces over 15,000 tons of tea per year, despite the threat from rubber plantation, which are progressively claiming an ever-expanding area. Thus, while the area under rubber

Photo 16.7 Tea garden near Jorhat, Eastern Assam

has doubled during the last 10 years from 7,736 ha in 1995 to 16,937 ha in 2005, the area under tea has stagnated lingering around 6,000 ha, though the initiative to make tea growing a commercial venture has increased the production of tea in the state threefold, from 5,700 tons in 1991 to 15,600 tons in 2001.

Distribution of Tea Gardens in Assam

Tea gardens in Assam are concentrated in upper Assam. There is hardly any tea plantation west of Nagaon, with the exception of Darrang and Lakhimpur, which were the areas of early plantation; most of the plantations are located south of Brahmaputra in Dibrugarh–Sibsagar–Jorhat tract (Fig. 16.3). These occupy the land between the paddy bearing fields on the upper terraces of Brahmaputra and the piedmont zone of Naga Hills and Karbi-Anglong. Slightly acidic soil and immunity from flood, with no chance of being submerged in water even during heaviest of rains, have made the old terraces and the sub-piedmont zone a favourite site for tea. Driving between Dibrugarh and Sibsagar, one encounters endless stretches of tea plantations. In fact, Dibrugarh and Sibsagar, together, have two-thirds of the total area under tea in Assam. Dibrugarh, Sibsagar, Darrang and Cachar together are the main districts of Assam accounting for over 90 % of the area of tea gardens. Besides, small areas under tea are found in Lakhimpur, Sonitpur, Golaghat and Karbi-Anglong. These districts have small tea growers whose number of late has multiplied (Photo 16.7).

The yield of tea is variable, ranging from 1,158 kg/ha for Karbi-Anglong to 1,882 kg/ha for Darrang, 1,894 kg/ha for Lakhimpur and 1,801 kg/ha for Dibrugarh. The variation is caused not so much by local physical conditions as by the upkeep and management of tea gardens. Usually larger tea estates have a much higher yield than small tea growers do.

To overcome the problems associated with tea plantations and to improve the quality and productivity of tea, an Experimental Research Station is established next to Jorhat city. The research station makes available necessary guidelines for tea cultivation to farmers as well as to tea estates. This station has also developed several hybrid varieties of tea and developed techniques for vegetative propagation of tea.

Today, Assam has over 270,000 ha of land under tea leaves producing over 450,000 tons of tea annually, employing over 1.2 million persons daily. The quantity of tea produced annually is highly variable. The tea trade takes place through a variety of channels, through direct supply to traders abroad by major tea estates, through tea auction centre in Guwahati and Kolkata and through wholesalers and retailers. The Guwahati auction centre handles auction trade of about rupees (INR) 1,000 crore every year. The North-East region has more than half the area under tea in India and produces 52 % of the tea leaves produced in the country annually.

16.4.2.2 Rubber

Unlike tea, North-East region is a marginal producer of rubber in the country having less than 3 % of the total area under rubber in India. Rubber plantation has been tried in most of the states at one time or the other. In some cases, as in Mizoram, the plantation has declined because of poor yield. In other areas such as Assam, it has grown only modestly, but in some states like Tripura and Meghalaya, rubber plantation has expanded. Today, the North-East region has over 50,000 ha under rubber plantation producing roughly 18,000 tons of rubber.

An indigenous plant of Latin America, rubber (*Hevea brasiliensis*), was introduced in Assam in 1955. The plant, originally believed to be growing only at a lower level, is now grown even at higher levels, though warm and humid climate of tropics is ideal for its growth. The plant requires a well-spread rainfall of over 2,000 mm between 25 and 35 °C, and a high relative humidity not less than 75 % is essential for good yield. Acid soils not exceeding a pH value of 6.5 are favourable.

Though rubber is planted in Assam, Meghalaya and Tripura, the results are very visible in Tripura where the rubber planters have tasted a level of prosperity not witnessed earlier. The states of North-Eastern India have over 50,000 ha of land under rubber plantation. Though the area under rubber in most states including Assam has risen marginally, in Tripura, it has increased twenty times, from 1,416 ha in 1998–1999 to 28,853 ha in 2009, of which over 60 % has tappable rubber plantation, producing 17,122 metric tons of rubber every year, valued at INR 102.73 crores. The other states of the North-East, together, have rubber plantation of around 20,000 ha (Photo 16.8).

Photo 16.8 Rubber plantation in Tripura

Rubber is most suited to *tila* (low longitudinal mounds) lands that dot the landscape in the area in Central Tripura. The planting of rubber and litchi, on the gentle prominences called *tilas,* is the most effective utilisation of these landscape features. The acreage under rubber in Tripura is perpetually growing with the support of the State Government and the Rubber Board of the Government of India. The rubber tree can grow to a height of 25–30 m, but tapping of latex starts when the plants attain a minimum height of 150 cm and a girth of 50 cm.

16.4.2.3 Areca Nut

Commonly known as betel nut, areca (*Areca catechu*) is an important commercial crop in North-East India, largely concentrated in Assam and Meghalaya. The plant has the distinction of being cultivated commercially only in India, in the states of Kerala, Karnataka and Assam. It grows in a variety of climatic conditions and can be grown up to a height of about 1,000 m ASL. Acidic soils typical of high rainfall areas are more congenial to its growth.

Betel nut is eaten as a stimulant with betel leaves. The tradition of chewing betel leaf with a bit of areca nut is a time-honoured practice in Assam, where betel leaf is also offered to guests as a mark of respect. While this aspect may have provided the incentive to grow the plants, its commercial value is a more attractive factor that induces farmers to grow it as cash crops. The betel nut plant requires a rainfall of over 1,000 mm, well distributed over the year. It reaches a height of 8–15 m, with a

Table 16.15 Area of fruit crops in North-East region

States	Fruit crops (area in 1,000 ha)								
	Banana	Pineapple	Citrus fruits	Apple	Mango	Litchi	Papaya	Others	Total
Arunachal	4.3	7.7	21.3	7.3	0.1	0.7	0.6	2.1	44.1
Assam	43.6	13.8	14.4	–	2.7	4.1	7.4	20.0	106.0
Manipur	4.4	10.9	2.0	–	0.2	–	1.9	5.2	24.6
Meghalaya	5.3	9.4	8.1	–	–	–	0.5	3.6	26.9
Mizoram	2.7	0.7	9.5	0.1	0.5	0.1	0.2	1.3	15,1
Nagaland	2.8	2.5	4.3	0.1	0.6	0.7	0.6	7.8	19.4
Tripura	4.9	4.3	8.5	–	3.2	1.6	0.5	7.4	30.4
Total	68.0	49.3	68.1	7.5	7.3	7.2	11.7	47.4	266.5

Source: Basic Statistics of North-East Region (2006:222–223)

slender bole without any foliage, but with a crown like a coconut tree. Besides growing as exclusive stands, the areca is also an invariable element in the homestead garden of Assamese farmers. Added to this is the fact that the slender plants of areca nut, like a tiny palm tree, survive well on slopes without much care, though regular manuring is important to get good yield.

The region has over 80,000 ha under areca nut of which 80 % is grown in Assam and another 10–12 % in Meghalaya. In other states, areca nut plantations are not so common, with a couple of 1,000 ha in Tripura. In Assam, areca nut is ubiquitous. It is difficult to find a village or a homestead where areca nut is not present. Occasionally, one finds large plantations of well-spaced plants as regular gardens. With an acreage of 74,000 ha, Assam produces around 70,000 tons of dry cured areca nut annually. The other states in the North-Eastern region, which have substantial acreage under areca nut, are Meghalaya and Tripura, with Mizoram gradually increasing its cultivation of areca nut. Meghalaya had over 11,000 ha of land under areca nut in 2003, almost double of what it was 15 years earlier when the state had just 6,000 ha of land under this plant. The distribution of areca nut is spread all over Meghalaya with East Khasi Hills accounting for almost half the acreage under areca nut plantation, followed by West Garo Hills. The demand and production of areca nut is growing, and during the last 20 years, both areas under this crop and its production have grown more than 50 %.

16.4.2.4 Horticulture

North-East region is a potential fruit basket that needs to be developed over a couple of decades, to enable its fruit production to be counted as an important element in the economy of the region. The nine fruits (banana, citrus, pineapple, apple, grapes, guava, litchi, mango, papaya) that form the horticultural landscape of the region together occupy 265,000 ha of land (Table 16.15). That is about 40 % of the total area under tree crops of various kinds. The fruits grown in the region include tropical fruits like mangoes, bananas, litchis and pineapple on the one hand and the fruits of

the temperate latitude like apple on the other. Pineapple, a fruit occupying a significant area, was introduced in India by the Portuguese and grows well in the humid climate of all the states in the region. The most common variety of citrus, the Khasi mandarin, is a native of the region and has been grown for long in Meghalaya. Other varieties of citrus fruits have been introduced from other parts of India. The most recently introduced fruit in the region is apple that is grown in Arunachal Pradesh and is being tried on an experimental basis in Nagaland and Mizoram.

Besides the fruits appearing in the above chart, there are other fruits like plum, pear and peaches which have been introduced in the region. In some areas they are still being grown on an experimental basis while in others, though successful, these fruit crops are not widely diffused. On Meghalaya plateau, particularly the eastern part, consisting of Khasi and Jaintia hills, flourishing plantations of plum, pear and peach have been developed, but their cultivation is not growing at a fast rate. Pear is also grown in Manipur in the Mao-dominated areas, and peach and plum have been introduced in Ukhrul and Mao hills areas and even in Manipur valley. These fruits are also introduced in Nagaland and Arunachal, but the experiment is not quite successful. Cashew nut is another fruit that is introduced in Garo Hills and grows well on the hill slopes.

The horticultural crops could be grouped into two broad categories:

1. Those that are indigenous to India or have been grown here for generations like banana.
2. Those that were introduced during the last 300 years by the Europeans. This category includes both tropical and temperate fruits. Pineapple, cashew nut and guava, being tropical fruits, were brought to India by the Portuguese. Among the fruits of temperate latitudes are citrus fruits, apples, peaches, plums and pears.

The relief and climate conditions of the North-East favour both varieties of fruits. While the plains of Assam and Tripura grow mango and banana, the higher parts of other states have introduced temperate fruits. Banana, though tropical in origin, grows up to a height of 1,000 m in the lower hilly parts of the peripheral hilly states.

In Arunachal, many of these fruits have found their own niche, depending on their temperature and rainfall requirement. For example, apple, walnut and kiwi are confined to the higher parts of western Arunachal Pradesh, largely in Tawang and West Kameng (Bomdila) districts, with some areas in the higher zone of Lower Subansiri district. In contrast, pineapple and banana are concentrated in the mid-level area of West Siang and Upper Subansiri districts. Siang (the upper reaches of Brahmaputra) and its major tributary Subansiri provide some accessible valley flats and gentle slopes that form ideal sites for banana and pineapple. States like Nagaland are growing passion fruits, besides experimenting with grapes.

Prospects of Horticulture

With a variety of climate and relief conditions, the North-East is the potential fruit basket of India. The states have been made aware of it, and the farmers are prepared to adopt new horticultural products wherever they sense economic gains. The Centres

of Indian Council of Agricultural Research and Assam Agricultural University in the region are engaged in serous research to judge the suitability of different crops and encourage their cultivation.

Horticulture also gains from the fact that it does not dislocate areas under cereals like rice, as fruits could flourish well even in hilly terrains. For long, the hillsides in the North-East region have been subjected to burning and shifting cultivation, to produce some cereals like rice, millets and maize, and the government agencies have launched schemes to flatten the hill slopes into terraced fields, where an annual system of farming could be practised. This has not met with much success. The answer to shifting cultivation is horticulture. The hill slopes could be utilised for orchards of different fruits, which will, like the cultivated cereals, give some return every year. The hilly areas of the North-East, especially Nagaland appears to be geared to replacing *jhuming* with orchards, which, with enough annual return, are proving a disincentive to the *jhumias*. A serious and dedicated effort to convert hilly regions of the North-Eastern India into a horticultural zone will change the face of the region, improve economy and even promote tourism.

16.4.3 Changes in Agriculture

During the last 50 years, there has been a substantial change in the agricultural landscape of the North-East region of India. The changes relate to the land use, the progressively expanding area under cultivation, the crop combination in each state, introduction of new crops and diversification of agriculture, intensification of land use and adoption of modern technology including high-yielding variety of seeds, improvement of farming techniques, increase in acreage under irrigation and application of chemical fertilisers. These changes can be summed up under four heads:

1. Expansion of agriculture
2. Intensification of farming
3. Diversification of cropping pattern
4. Modernisation with greater inputs of seeds and fertilisers

16.4.3.1 Expansion

In all the states of the region, there has been an expansion of land under cultivation. During the wake of the food crisis of the 1970s in India, most states struggled to expand the net sown area, besides improving agricultural productivity. In most of the cases, the increase in the net sown area is attributed to the utilisation of culturable waste. Faced with the scarcity of food, most states of the North-East region strove to bring more land under cultivation. The net sown area of the region has increased from 3,036,000 ha in 1971 to around 4,000,000 ha in 2003. The increase in cultivated area saw a corresponding decline in the culturable wasteland that was lying idle (Table 16.16). Added to this was the increase in the intensity of

Table 16.16 Change in the net sown area and culturable waste in the North-Eastern states between 1971 and 2001

States	Net sown area and change (,000 ha)			Culturable waste and change in (,000 ha)		
	NSA in 1971	NSA in 2001	Change in percent	Barren and culturable waste in 1971	Barren and culturable waste in 2001	Change in percent
Arunachal	115	164	+43	185	58	−69
Assam	2,235	2,734	+22	1,971	1,541	−22
Manipur	140	140	0.0	1,419	1,419	0.0
Meghalaya	162	203	+42	1,900	577	−70
Mizoram	41	94	+129	747	143	−81
Nagaland	102	300	+194	1,263	65	−95
Tripura	241	280	+16	13	4	−69
Total	3,036	3,876	+27.6	7,498	3,803	−49.2

Sources:
1. Figures for 1971 are taken from *Basic Statistics of the Northeast* (1977:38)
2. Figures for 2001 are taken from *Basic Statistics of the NER* (2006:183)

agriculture, both by applying more inputs and multiple cropping. The degree of expansion can be judged from the change in the net sown area during a period of 30 years, from 1971 to 2001.

There is an impressive expansion of area under agriculture which works out to around 27 % for the entire North-East region, though in case of the hilly states, it is exceptionally high. The states of Arunachal Pradesh, Nagaland and Mizoram show a very high increase in their cultivated acreage. Backed by Government and the agricultural departments of these states, they have expanded their area partly by converting *jhum* land into an annual system of farming, but no less by converting large areas that were either lying barren or ignored as cultivable waste into cultivated land though with a subnormal return.

16.4.3.2 Intensification of Agriculture

This implies increase in yield and also multiple cropping of part of the cultivated land. The area sown more than once in 1971 (768,000 ha) more than doubled in 2001, reaching a level of 1,737,000 ha. The greatest increase is seen in Assam, where 730,000 ha of additional land developed the capacity to grow more than one crop during the year (Table 16.17).

Most of these states developed irrigation facilities or used paddy fields for growing subsidiary *rabi* crops. Multiple cropping has gained ground particularly in those areas which received the benefit of irrigation. Assam benefitted most, following a number of irrigation projects in Nagaon, Darrang, Barpeta and several other districts. Shallow tube wells and other minor projects enhanced the prospects of multiple cropping in such areas as they enjoyed year-long irrigation facilities. Irrigation is

Table 16.17 Increase in the area sown more than once in Assam (1971–2001)

States	Areas sown more than once		
	1971 (,000 ha)	2001 (,000 ha)	Change in percent
Arunachal	15	99	+560
Assam	599	1,330	+122
Manipur	7	69	+885
Meghalaya	31	46	+48
Mizoram	–	–	–
Nagaland	–	14	–
Tripura	155	148	+29

Sources:
1. Figures for 1971 are taken from Basic Statistics of the North-East (1977)
2. For 2001, the figures are taken from Basic Statistics of the NER (2006:183)

the single major factor that has made possible not only multiple cropping but also enabled the farmers to opt for high-yielding variety of seeds and application of fertilisers that have ensured better yields.

The results of intensity of farming can be observed in increased yield in most of the crops, but particularly those that require timely irrigation. The changes in the yield of a few crops from different states would show how farming in the region is made intensive (Table 16.18).

While there has been an overall increase in the yields of different crops, it is more pronounced for rice as seen in Assam, Manipur and Tripura. In case of maize, the yield increase is exceptionally large in the hilly states of Nagaland and Mizoram. The hilly states still love maize as food and prefer it as animal feed. They have taken in a big way to several improved varieties of hybrid maize, to increase the yield.

16.4.3.3 Diversification of Cropping Pattern

Diversification refers to the adoption and cultivation of a variety of crops, a balanced combination as opposed to monoculture. This was a natural choice in subsistence economies where the farmers tried to fulfil all their requirements of food with the home-grown products. This imposed on them the necessity of growing pulses, oilseeds as much as cereals. As transportation improved and interregional exchange of agricultural products through trade became possible, farmers chose to grow crops, best suited to the physical conditions of the area, and the ones that fetched maximum return. In many areas this gave rise to a system of monoculture.

The North-Eastern region is composed of a varied topography and presents optimal conditions for a variety of crops, depending on the relief, particularly the height, temperature and rainfall of the area. The plains with high rainfall exceeding 2,000 mm, always induced farmers to grow rice that gave them higher yield, improved further with the arrival of high-yielding varieties.

Contrasting with the plains, the peripheral hilly region practising largely *jhuming* had developed a culture of mixed farming that was a microform of diversified agriculture. The *jhumias* (shifting cultivators) grew 10–12 crops in the same field at

Table 16.18 Increase in the yield of rice and maize (kg/ha)

	Rice				Maize			
States	Year	Yield (kg/ha)	Year	Yield (kg/ha)	Year	Yield (kg/ha)	Year (2002–2003)	Yield (kg/ha)
Arunachal P.	1984	1,088	2002–2003	1,224	1984	1,160	2003–2004	1,365
Assam	1971–1972		2003–2004		1984	612	2003–2004	700
Autumn R.	1971–1972	623	"	991				
Winter R.	1971–1972	1,105	"	1,651				
Summer R.	1971–1972	1,500	"	1,753				
Total Rice	1971–1972	981	2002–2003	1,471				
Total Rice	1984	1,049						
Manipur	1984	1,989	2002–2003	2,377	"	2,259	"	2,200
Meghalaya	1984	1,124	„	1,717	„	1,369	„	1,529
Mizoram	1984	861	„	1,912	„	1,036	„	1,875
Nagaland	1984	847	„	1,490	„	793	„	2,000
Tripura	1984	1,402	„	2,262	„	NA	„	1,000

Sources:
1. Rice yield for Assam (1971–1972) statistical Abstract of Assam, 1978, p.76
2. Crop yields for all states for 1984, Basic Statistics of North-Eastern Region, North-Eastern Council. Shillong, p. 43
3. Yields for 2002, Basic Statistics of NER (2006:187)

a time and harvested them after a maturity period, specific to each crop (Table 16.19). The culture of mixed farming continues even in the annual system, where the hill farmers still grow a variety of crops to meet their requirement.

Table 16.19 compares the two cases of plain and hilly area. While Assam tends toward monoculture with 93 % of its acreage under food crops claimed by rice, Nagaland shows a more diversified nature of cropping pattern with sufficient acreage under maize, millets or even wheat. A more diversified culture is an insurance against the failure of a crop like rice. But, in the plains of Assam, Manipur and Tripura, each with more than 90 % of area under food crops and a high priority for rice, the tendency is toward monoculture. Rice is the staple food of the people in the region, besides it promises a high return.

16.4.3.4 Modernisation

Agriculture in the region, as compared to what it was three decades earlier, has undergone considerable modernisation, which includes better managed fertiliser application, pest control and use of better agricultural facilities, besides the use of optimally

Table 16.19 Area under different food crops in Assam and Nagaland and their percentage of the total area under food crops

	Assam		Nagaland	
Crops	Area in 000 ha	% of the total area under food crops	Area in 000 ha	% of the total area under food crops
Rice	2,541	92.40	151	63.17
Maize	20	0.72	40	16.73
Wheat	69	2.00	8	3.34
Small millets	8	0.29	10	4.18
Total cereals	**2,638**	**95.09**	**209**	**87.42**
Gram	2	0.07	1	0.41
Tur	7	0.25	6	2.51
Other pulses	102	3.70	23	9.60
Total pulses	**111**	**4.03**	**30**	**12.50**
Total food grains	**2,749**	**100.00**	**239**	**100.00**

Source: Basic Statistics of North-East Region (2006, tables 153 and 162, pp. 187 & 197)

suited high-yielding varieties of seeds and creation of additional irrigation potential. Pressure of population has resulted in a changed pattern of agricultural productivity in Lower Brahmaputra Valley, as demonstrated by Mipun and Das (2004).

The modernisation programme is more visible in Assam and Tripura, though the diffusion of advanced agricultural methods in the peripheral hilly region is catching up. In most cases, the structure of holdings is a serious constraint. Assam has over 60 % of its agricultural holdings below one hectare. Only an eighth of the holdings have a size over two hectares. Medium (4–10 ha) and large (>10 ha) holdings together add up to less than 4 % of the area. In such a situation, 2.7 million small and marginal farmers still remain at subsistence level and are not in a position to afford required fertilisers and agricultural implements or easily adopt high-yielding varieties of seeds. Such is also the situation in the hilly regions. The Government initiative and subsidies have helped farmers adopt better methods, but their impact is slow.

In Assam, 55 % of the area under rice is under high-yielding variety of seeds giving spectacular results. About 45–50 % of the net sown area under high-yielding variety seeds carries more than one crop a year. To propagate the use of fertilisers, Farmers' Field Schools were conducted to make them aware of the benefits of modern techniques. Better agricultural implements, which can be used effectively in the plains, like power tillers, have been introduced in Assam, though their use is still not widespread.

Agricultural marketing is facilitated by Agricultural Marketing Boards, which have established warehousing facilities in the state. In Assam, there are 172 wholesale markets, of which 16 are principal markets with many submarkets. All these provide remunerative prices to the farmers for their products and seem to prove an incentive to the farmers to increase agricultural productivity.

In the hilly areas, modernisation has two main directions. First, the area under wet rice cultivation (WRC) is increasing. A higher yield of wet rice cultivation as well as of maize and pulses, following the introduction of high-yielding varieties, is

apparent. But more importantly, hilly states like Arunachal Pradesh, Nagaland and Mizoram have increased the areas not only under rice but also under soya bean, fruits and vegetables, spices, roots and tubers and even plantations. Modernisation in the hilly states has more to do with increasing the area under horticulture and improved variety of seeds. There was a time when there was a dominance of *jhum* rice in Nagaland, but today, the ratio between *jhum* rice and terrace and wet rice is 55:45. Part of the *jhum* rice area is also being replaced with better variety of maize. Irrigation is expanding even in the hilly area and the most spectacular case is that of Nagaland, where one-fifth of the net sown area is irrigated – an incredible achievement for this hilly state. During the 5-year period 1995–2000, the application of fertilisers in Nagaland has doubled from 513 tons in 1995 to 975 tons in 2000. With the introduction of all kinds of fruits, ranging from apple to mango, horticulture has grown in these hilly states. To a casual observer, it appears that these hilly states, particularly Arunachal Pradesh and Nagaland, have launched an agricultural revolution.

Tripura is another state where there is a wave of modernisation in agriculture. Balanced use of fertilisers, use of hybrid seeds, infrastructure for storage and marketing and improved methods of *jhum* cultivation, associated with integrated crop management in the state, have made it self-sufficient in food. Use of power tillers has become quite frequent. The state has modernised a Seed Testing Laboratory and a Pesticide Testing Laboratory and initiated the construction of dehumidified godowns for storage of seeds. These developments have enabled the state to overcome the crisis situation or out of unprecedented immigration of refugees from Bangladesh.

16.5 Agriculture and Food Supply in the North-East Region

The basic function of agriculture in the North-East is to provide food and nutrition to the people. To assess the food requirement of the region is a complex calculation, which should take into account not only the age and sex structure of the population in terms of its need of different nutritional components of food, but also of the minimum availability of food. Not entering into a complex accounting of the food budget of the region, what is examined here is a simplistic measure of food requirement and food sufficiency in the region. This is, therefore, an approximation and gives a rough idea of food production situation in the region.

As a thumb rule, a daily minimum requirement of 450 g of food grains per person is taken as a standard basis, for a quick estimation of food requirement of a region. The food production and food requirement of the North-East region is given in Table 16.20 on the basis of 450 g/per day/person.

The total production of food grains in the region is not adequate to meet the minimum requirement of food grains of the people. The worst case is presented by Meghalaya, though it is likely that the availability of meat and more horticultural products in the state enable it not to rely too heavily on food grains. One may think that there could be some misreporting of data, but even according to the Directorate of Economics and Statistics, Meghalaya gives a production of total food grains in the state in

Table 16.20 Food production versus food requirement in the North-East

States	Population (2001)	Production of food grains in 2001 (tons)	Food available per person per day (in grams)	Surplus or deficit
Arunachal P.	1,097,961	241,000	601.0	Above the minimum
Assam	26,655,528	3,895,000	400.3	−11.04 %
Manipur	2,166,700	392,000	495.6	Above the minimum
Meghalaya	2,318,822	221,000	261.1	−42 %
Mizoram	888,573	129,000	397.7	−11.6 % (shortage)
Nagaland	1,990,036	389,000	535.5	Above the minimum
Sikkim	540,203	102,000	517.3	Above the minimum
Tripura	3,199,203	558,000	477.8	Above the minimum
Total	38,857,769	5,927,000	417.8	

Sources:
1. Census of India 2001, General Population Tables pp. 70–90
2. Basic Statistics of North-East Region (2006, table 162, p. 197)

1998–1999 as 186,782 tons. Thus, a figure of 221,000 tons of food grains in 2001 as given in the above statement could not be a misreporting. Mizoram and Meghalaya and to some extent even Assam have yet to produce enough food for their population. This is not to suggest that each state has to produce adequate food for its population but only to emphasise the need for improving agriculture.

16.5.1 Agricultural Regionalisation

There are no distinct agricultural regions, as rice, the principal crop in all the states, grown in heavy rainfall areas, signals a similar typology. There are yet differences because of height and the traditional agricultural practices existing in the hilly states. Thus, one can at best think of types and not of distinct regions, based on:

1. *Rice dominating* alluvial plain of Assam, Manipur and Tripura. These are the virtual monoculture areas.
2. *A mixed culture* having both *jhum* cultivation and settled farming with rice as the leading crop, in the hilly regions of Arunachal, Nagaland, Manipur, Mizoram and Meghalaya. These areas have a diversified cropping pattern, having a variety of types, like cultivation of rice in the broad valleys in the Mairang region of Meghalaya, traditional terraced cultivation as practised by Angamis of Nagaland and regular settled cultivation of Apatanis and Khamtis. Traditionally these areas were dominated by *jhuming*, the regional term for shifting cultivation, but the practice of *jhuming* is declining, and an optimal land use and farming practice may soon emerge.
3. *High altitude pockets* with a different agricultural typology. In this category, one may put Tawang area of Arunachal where wheat is the principal crop because

of temperate conditions that exist at 3,000 m ASL. Similarly, at a little lower altitude in the area above 2,000 m, maize is the primary crop presenting a different typology. Sikkim has a different combination of crops like maize, rice and wheat and is different from other regions.

4. *Agro-horticulture type* – The hilly areas are becoming the favourite sites for all types of plantation. This is a recent development and expanding fast in Nagaland, Arunachal Pradesh and Garo Hills of Meghalaya. In due course, it may be called agro-horticultural type.

Agriculture in the North-East is typical of the Southeast Asian domain of rice culture. Mixed culture common with 'slash and burn' cultivation, practised for centuries, is widespread in the hilly areas. Tea plantation is undoubtedly the most important commercial crop of Assam. Horticulture is gaining ground in recent decades. The region does not yet produce enough food grain, but there are prospects of better and more profitable agriculture and horticulture in the years to come.

References

Acharya KCS (1983) Food security systems in India. Concept Publication, Delhi

Barpujari HK (1998) North-East India: problems, practices, prospects. Spectrum Publications, Guwahati

Basic Statistics of North-East Region (1977, 1982, 1992, 1995, 2000, 2006) North-Eastern Council Secretariat, Ministry of Home Affairs, Government of India, Shillong

Borthakur DN (1992) Agriculture of the North-Eastern Region with special reference to hill agriculture. Beecee Prakashan, Guwahati, p 265

Dikshit KR, Dikshit JK (2004) Shifting cultivation studies in India: a review. Man Environ 29(2):37–69

Government of Assam (1966–1967) Basic statistics relating to Assam's economy, 1953-56 to 1966-67. Department of Economics & Statistics

Government of Assam (2006) Statistical handbook, Assam, 2006. Directorate of Economics & Statistics, Guwahati

Guha A (1979) Assamese peasant society in the late 19th century: structure and trends. Occasional paper no. 25. ICSSR, CSSSC, Calcutta

Imperial Gazetteer of India (1907) The empire, vol III Economic. Clarendon, Oxford, p 97

Mipun BS, Das Dipak C (2004) Population pressure and changing pattern of agricultural production in lower Brahmaputra. Trans Inst Indian Geogr 26:21–26

Prasad RN, Sharma UC (1994) Potential indigenous farming systems of the North-eastern Region. ICAR NE Hill Region, Barapani, Meghalaya, India

Robinson W (1841) A descriptive account of Assam with a sketch of the local geography and concise history of the tea plant in Assam. Ostell & Lepage, British Library, Calcutta, p 222

Sarma SN (1981) Social changes in Assam 1750–1950. J Univ Gauhati 28 & 29:109–112

Singh S, Daimari TC (2003) Determinants of labour productivity in tea cultivation in the Upper Brahmaputra Valley. Trans Inst Indian Geogr 25(162):9–19

Chapter 17
Industries and Associated Economic Activities

Abstract North-East India is industrially far less developed than most other parts of India. A few industries that have grown here are based on local raw material, where raw material is the primary governing factor in the location of these industries. Such industries are tea, petroleum, petroleum refineries and petroleum products, chemicals and fertiliser, plywood, pulp and paper, cement and thermal power-generating units. Besides, the region has a strong core of cottage industry, the most important of which is silk yarn and cloth and other forest-based industries, like bamboo products, furniture and a variety of domestic utility goods. Among the states of North-East India, Assam is the most industrialised state. In Assam, there are a very few industrial clusters which are concentrated in the North-Eastern corner of the state, centred around Digboi and Nahorkatiya, the two principal petroleum and gas fields. The four oil refineries are almost equally spaced in their location. These are at Digboi, Numaligarh in Golaghat district, Guwahati and Bongaigaon. The last station has also developed a mega thermal power unit with an installed capacity of 500 MW power generation. In Meghalaya, there are several cement factories that utilise the local limestone. A gas-based mega thermal power-generating unit is established in Tripura, using locally extracted natural gas. The greatest hope of the region lies in harnessing the hydroelectric potential of Arunachal rivers, which have a potential of 50,000 MW, 50 % of the total hydroelectric power potential of India. The contribution of industries to the economy of the region, as a whole, is limited to less than 20 %, and much of the income is generated from the tertiary sector of the economy.

Besides the fact that the region doesn't possess the advantage of a huge market, and distribution of manufactured goods is not quite economic because of a long haul of transport, there are other factors which inhibit the growth of industries. The most important of these is the absence of an encouraging atmosphere, reflected in insurgencies, hindrance in building an industrial unit, threats of extortion, violence and an overall attitude of hostility to entrepreneurs and investors. Even in the government-sponsored projects like the gauge conversion of tracks, the railways face these difficulties. Among other things, the socio-political environment needs to change to

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attract industries. There is a perception that opening of the East–West corridor linking India with Southeast Asia via North-East India will bring industries to the region, but it is not a certainty.

17.1 Industrial Development

The term industry is defined as an organised enterprise producing goods and services for the people. In economics, all kinds of productive enterprises are referred to as industry, classified into primary, secondary and tertiary industries. Thus, even agriculture and extractive enterprises like mining, fishing and forestry clubbed together are called primary industries. Likewise, secondary industry implies manufacturing and production of goods, and tertiary enterprise refers to service industry. In recent decades, quaternary occupation, implying engagement in white-collar professions like research and development is added to the existing categories of enterprises. The general notion of industry, however, includes manufacturing of goods or processing of some products. Here, the focus is largely on secondary enterprises, i.e. manufacturing and cognate activities.

The North-Eastern region of India is one of the least industrialised regions of the country, and manufacturing has not reached an optimal stage. In the states of the North-Eastern region, with the sole exception of Tripura, the share of secondary industry in the net domestic product is below 20 %, but often, the share of industry in the income of a state dips to below 15 %.

The secondary sector, comprising manufacturing, construction and electricity, gas and water supply, is the lowest contributor in the income of the region. If all the states in the North-East are taken together, secondary sector contributes just over 18 % to the region's income, contrasting with the primary sector contributing 31.4 % and the tertiary sector that is generating around 50 % of the income of the region (Table 17.1). Even in the secondary sector, the share of manufacturing, with which the industries are generally identified, is far less, and in no case does it exceed 11 %. In most of the states, it lingers between 2 and 5 %. The most significant contributor, to the secondary sector of the economy, is construction

The actual contribution of manufacturing to the net income of the states is INR (Indian rupees) 71,478 million, a sum equivalent to 8.02 % of the net domestic product of all the states of the North-Eastern region.

The contribution of industries to the economy of the states of the region expressed in terms of net domestic product is relatively small and varies with 0.75 % in Mizoram to 5.6 % in Manipur and Meghalaya and 10.35 % in Assam (Table 17.2). This only suggests the inadequacy of industrial development in the region.

The manufacturing industry can be classified in a variety of ways. This could be heavy and light industries or capital and consumer goods industries, depending on the manufactured products, or one could also classify them into industries tethered to the raw material, fuel and market or footloose industries which could be developed without any regard to transport costs. In the case of Assam, the discussion

Table 17.1 Net state domestic production, at factor cost, at current prices for each sector of economy, in the states of the North-East (income in 100,000, Indian rupees, INR) and percentage of total income

Industry	Arunachal Pradesh	Assam	Manipur	Meghalaya	Mizoram	Nagaland	Tripura	Total
Primary sector	67,332	1,932,489	91,609	84,716	30,628	129,017	173,798	2,509,589
	(38.53 %)	(36.80 %)	(38.38 %)	(30.18 %)	(23.77 %)	(33.38 %)	(25.80 %)	(35.18 %)
Secondary sector	25,833	931,888	42,867	30,921	17,340	41,991	143,826	1,234,666
	(14.81 %)	(17.75 %)	(17.96 %)	(11.00 %)	(13.40 %)	(10.86 %)	(21.37 %)	(17.31 %)
Tertiary sector	81,582	2,385,584	104,158	164,983	80,850	215,403	143,826	3,176,385
	(46.68 %)	(45.44 %)	(43.64 %)	(58.79 %)	(62.76 %)	(55.75 %)	(21.37 %)	(44.53 %)
Total	174,747	5,249,961	238,634	280,818	128,818	386,411	672,790	7,131,981

Source: For Assam – Economic Survey of Assam, 2006–2007, Directorate of Economics and Statistics, Government of Assam. For other states the data is extracted from the North-East Development Foundation Data Bank, sourced from Central Statistical Organization, Govt. of India

Table 17.2 Net domestic product of North-Eastern states (2006–2007) and the share of manufacturing in the NDP of each state (million Indian rupees)

States	Total net domestic product in lakhs	Income from manufacturing in lakhs	Percentage of the NDP of the state	Data year
Arunachal P.	30,294.8	769.6	2.54	2006–2007
Assam	570,334.6	60,443.9	10.35	2006–2007
Manipur	47,865.4	2,684.0	5.6	2006–2007
Meghalaya	65,650.4	3,714.9	5.66	2006–2007
Mizoram	26,285.7	197.1	0.75	2006–2007
Nagaland	54,800	1,080	1.97	2006–2007
Tripura	95,462.8	2,589.3	2.71	2003
Total	890,693.7	71,478.8	8.02	

Sources:
1. For Assam - Economic Survey of Assam, 2006–2007, Govt. of Assam
2. For other states the data extracted from North-East Development Foundation NEDFi Data Bank – sourced from Central Statistical Organisation, Govt. of India, as on 12-4-2010

would begin with the traditional industries that thrive even today, followed by heavy industries, involving a complex organisation, like petroleum and chemicals. Other industries, based on local raw material like wood, plywood and paper, will be examined with their location, followed by the consumer goods industries and the industries producing sundry goods. Tea industry is partly discussed in plantation agriculture, but its processing, packaging and trade will find a place in this chapter.

17.1.1 Industrial Development in the North-East

Much of the industrial development that has taken place in the North-East is confined to Assam for a variety of reasons, of which the most important is accessibility. The peripheral mountainous region has been highly inaccessible all through history and even today. Many parts of Mizoram, Manipur and Arunachal Pradesh are not easily accessible. Thus, transport was the main problem that limited the development of industries to Brahmaputra valley.

17.1.2 Raw Material Availability

Most industries of the region, whether pre-existing from the colonial period or developed later, are meant to utilise the local raw material. Availability of crude oil, coal and limestone and the existence of an extensive forest cover were enough of an incentive, to create industries based on these raw materials. Development of petroleum refinery is based on the supply of crude from Digboi and adjacent

oilfields, discovered lately. Cement plants relied on local availability of limestone, coal and clay, and plywood industry exploited the forest wood available in abundance. Even the pulp and paper industry, consuming a large mass of cellulosic material derived from the forests, found suitable locations in Assam. Transport was never a problem as the Brahmaputra valley, which was linked by North-East Frontier railway with Chittagong, a port on the Bay of Bengal, in the pre-independence days. Even Brahmaputra was an effective waterway till 1950 for transporting goods. The earthquake of 1950 changed the bathymetric profile of the river making it susceptible to running aground. After the 1950s, accessibility to Assam is improved by building several bridges on Brahmaputra, converting the original metre gauge into broad gauge railway line and streamlining the highways.

17.2 Traditional Industries of North-East Region

The traditional industries of the region were meant largely to meet the requirement of the local population with some exchangeable surplus. There was no large-scale manufacturing and marketing. These industries were often family-owned where the craft was passed from generation to generation and survived with some improvement. The most important of these industries was weaving. Weaving is by far the oldest industry in the region, not confined to only Assam, but found even in the remotest corner of the region. This is also the most favourite cottage industry with the indigenous people.

17.2.1 Weaving

Weaving has been a traditional craft in all the states of the region. Tribal communities in Arunachal, Nagaland, Mizoram and Meghalaya have been practising weaving for long, and the craft still continues though on a diminutive scale. As a cottage industry, it is highly diffused and is ubiquitous in the region. What is important is that it may have been neglected as a family enterprise, but it is being promoted by the state, as a craft of great importance. The cottage textile designs and their products have, besides their being aesthetically very elegant, a great commercial value. It is a heritage, which can be economically harnessed in the contemporary situation, when economic development is badly needed. The weaving in the family was often practised by the womenfolk who settle down to weaving in leisure time. In the beginning of last century, almost all the clothes worn by Nagas were woven at home. Initially, the cotton required was grown locally, but gradually imported yarn began to be used and spinning receded in the background.

In Assam women, as in the past, pursue the industry as a part-time occupation to produce the cloth required by each family, but they detest production on a commercial basis. The articles of production generally include *mekhela, chadar,*

riha, churia, cheleng, borkapur, gamosa and piece cloth. These are items of sartorial outfit in Assam.

The North-East region has the highest concentration of handlooms in the country. Of the total handloom strength of 2.54 million units in India, about 1.5 million are in the five states (Arunachal Pradesh, Assam, Manipur, Nagaland and Tripura) of the North-East region. According to the Handloom Census of 1995–1996, conducted by the Government of India, Assam had 1.322 million looms providing employment to over 2.3 million people. The state has developed 102 Handloom Training Centres, Handloom Production Centres and a number of Weavers' Extension Service Units. There appears to be a growing awareness of preserving, developing, improving and commercialising the weaving industry of the state.

In Nagaland and Manipur, the tradition of shawl making is time hollowed. These shawls, often made of wool, are produced by different tribes, each having its own distinctive pattern. The tradition of weaving in the hilly areas is lately revived and has even benefited from the encouragement and support extended by the State Governments, by starting training centres for weaving and carpet making and the use of the fly shuttle loom. The weaving industry, particularly the making of shawls, has received impetus as a result of market demand for these aesthetically woven artistic shawls. The shawls woven by the Nagas are in great demand; as besides being elegant, they are considered an apt as symbol of ethnic art.

Weaving and handloom industry occupies a very important place in the economy of Tripura, where 16,334 weavers are gainfully engaged in weaving. While the tribal population produces its own cloth on handloom with elegant designs, the commercial production of handloom cloth is in the hands of Bengali and Muslim weavers. Among the traditional varieties of cloth produced by the tribal people, one called *riha* (breast cover) is famous for its colourful variety and texture. Tripura has embarked on a large programme of establishing Primary Weaving Cooperative Society, and clusters of weavers have been developed to facilitate improvement and marketing of handloom products. In Arunachal Pradesh, each district has some degree of weaving, though there is greater concentration in Tirap and West Siang areas. Like other states of the North-East, Arunachal has also established a number of Training and Development Centres for Handloom Weaving. The state produces handloom cloth worth Rs. 40 lakhs (Photo 17.1).

17.2.2 Sericulture

Unlike weaving which was more or less universal among most communities of the North-East, sericulture is largely confined to Assam valley with extension to the submontane areas. It is an ancient art of Assam that was promoted and grew under the patronage of the rulers since antiquity. There are two clusters of silk-producing area in Assam, the area centred around Sibsagar including part of Dibrugarh and Lakhimpur districts and the Kamrup region and the area around it. In fact, bulk of the *muga* produced in the state comes from Sibsagar area, while the Kamrup region

Photo 17.1 Silk-weaving (Miri) lady in a family cottage on Majuli Island

produces all kinds of silk – *eri*, *muga* and *pat*, the last one being rather uncommon. The North-Eastern region produces 877,000 kg of raw silk every year, 60 % of which is produced by Assam alone.

The difference between *eri* and *muga* silk is based on the two different species of silkworm, fed on different diet and reared differently. While *eri* is coarse and a utility silk that is spun like cotton and wool, *muga* is straightway reeled and is worked into a very fine variety of quality silk, entering the luxury and fashion world.

17.2.2.1 Eri (Endi) Silk

Eri silk is a coarse variety of universally used silk in Assam. It is produced by a variety of silkworm called *Attachus ricini* that is widely believed to be a native of Assam. It is fed on the leaves of *eri*, the castor oil plant (*Ricinus communis*), and shows preference for humid and rainy climate like the one obtained in Assam. The worms, unlike those of *muga* silk, are reared indoors. Traditionally, the rearing of the *eri* worm has been in the hands of tribal communities like Garos, Mikirs and Kacharis, but the practice is now adopted by many non-tribal communities, particularly in Darrang, Kamrup and Nagaon districts, of mid-Brahmaputra valley. In Nagaon district, sericulture is common in Raha area and is practised by Nath community who are locally known as 'Yogi' or 'Katoni'. Rampur and Sualkuchi specialise in the production of both kinds of silk, *eri* and *muga*. Nalbari, Tamulpur

and Palasbari are important centres of production of *eri* silk in Kamrup district. In fact, *eri* culture is quite widespread in Assam.

17.2.2.2 Muga Silk

Muga is a golden-colour durable silk and is widely equated with Assam silk. It was much in demand in Europe during the nineteenth century and formed an important element in Assam's export trade. Muga worms (*Antheraea assamensis*) are fed on the leaves of *Som* (*Machilus bombycina*), and hence the Som tree itself has become important. The trees and leaves are guarded to generate enough foliage for the worms. The two commonly reared varieties of *muga* worms are known as *katia* (autumn) and *jethua* (spring) varieties. The life cycle of the insects is 50–80 days, of which they require 25–40 days to reach maturity, before they begin to spin and make cocoons. The silk is produced in Kamrup district in lower Assam and the area around Sibsagar in upper Assam.

17.2.2.3 Pat Silk

Another type of silk which has not found much favour with the silk producers of the state is '*pat*', a kind of silk produced by two species of silkworm: 'univoltine', locally called '*Bar-Palu*' (*Bombyx textor*) and 'multivoltine' '*Saru-Palu*' (*Bombyx croesi*), fed on mulberry leaves. Among the causes of reluctance of silk producers to produce '*pat* silk' is death of mulberry trees, but the perception is that silkworms producing *pat* silk are very vulnerable to harsh conditions and diseases and often die prematurely. Despite this perception, a large programme of mulberry plantation is launched in Manipur as well as in Mizoram.

Sualkuchi in Kamrup district is the most important centre of production and marketing of silk in North-East India. It houses a number of silk-producing societies, besides a number of weavers working outside the shadow of these societies. It is a trading centre as well, and silk produced here is exported to other parts of India and abroad. Another important place for the production and marketing of *eri* and *muga* silk, though not as important as Sualkuchi, is Rampur

17.2.2.4 Silk Production in Meghalaya and Manipur

Eri silk is also produced in Manipur and Meghalaya besides Assam, but the latter has a virtual monopoly on *muga* silk. While Manipur rivals Assam in the production of *eri* silk, Meghalaya, largely Garo Hills, produces less than half the *eri* cocoons produced in Assam.

The prospects of silk industry appear encouraging as Central Government organisations like Khadi and Village Industries Commission have stepped in to help increase production and marketing of the product.

17.2.3 Basketry, Cane and Bamboo Industry

The entire North-Eastern India is rich in bamboo and cane and is renowned for its bamboo culture, a fact that implies excessive use of bamboo and cane in utility goods. Besides Assam, Arunachal Pradesh, Nagaland, Mizoram and Tripura use bamboo extensively. Bamboo mat is used as a house wall, as a stilt and even as flooring material, often a raised platform in a tribal household, especially in Arunachal Pradesh. Some of the tribal communities, but especially the Nagas, use bamboo pores for transporting water over a long distance, as from the valley bottom to the plateau top. Bamboo is also used for making houses, furniture, home utensils, mats, protective fences, hunting equipments, fishing nets, hats and for several other purposes. In tea-producing areas, it is used to make plucking baskets. The state of Tripura specialises in the production of quality furniture of all shapes and sizes produced out of bamboo and cane. Mizoram, a state rich in bamboo resources, is planning to harness bamboo to produce high-value products. Today, a lot of bamboo is exported to paper mills as a raw material.

Known to be growing in clumps in the forests, bamboo growth in the North-East region represents a seral stage in the process of succession, after the burning of forests as a prelude to *jhuming*. Bamboo forests, in the North-East, have multiplied as a result of the practice of *jhuming*. This is particularly true of Mizoram, Tripura and Nagaland. Mizoram is known for its superabundance of bamboo forests and contributes 40 % of India's 80 million tons of annual bamboo crop. The annual value of the bamboo produced in Mizoram in the year 2000 was Rs. 8,430,262. The state of Mizoram considers bamboo a great asset and has launched a programme for manufacturing bamboo-based products, like fibreboard, bamboo mat-ply, floor tiles and furniture. They are setting up a bamboo-processing plant at Sairang to produce a range of goods that could earn substantial revenue to the state. Similar project is undertaken by the Government of Tripura for realising better value of the bamboo through utility goods manufactured from bamboo.

The handicrafts based on bamboo include among other things '*japi*' a traditional hat that is usually offered to individuals in Assam, as a mark of respect. Most districts of Assam produce *japis*, but special mention has to be made of Nalbari and Kamarkuchi, where ornamental *japis* are produced.

17.2.4 Other Cottage Industries

There are several other traditional crafts such as bell metal and pottery that still flourish in Assam. Utensils made of alloys, brass and bell metal follow a traditional design. These are made all over the state but Hajo in Kamrup and Sarthebari in Barpeta district are especially known for their quality.

17.3 Large-Scale Industries

Industrial development today is identified with the development of large-scale industries using latest technologies, specialising in mass production of goods, and providing gainful employment to a large number of people. Such industries are capital intensive and requiring huge investments. Locationally, they are oriented to the availability of raw material, adequate supply of power, easy transport and access to markets without incurring huge transport costs. Such industries also look for incentives from State Governments like easy availability of land and other infrastructure and tax concessions on their earnings. The locational calculus of large industries is too complex, and the entrepreneurs also look for trade-off between different advantages and benefits on the one hand and constraints on the other.

In the North-East region, most of the industries are based on the easy availability of raw materials, and some like petroleum are tethered to the site of occurrence. The main industries of the North-Eastern region are listed in Table 17.3.

The main industries of the region are petroleum and petroleum-based industries, like petroleum refineries and petrochemicals, cement, fertilisers, plywood, pulp and paper, sugar and fruit-processing plants. These industries are looked upon by the people of the state as an avenue of employment for the people, besides adding to the wealth of the country and the region. The major industries give rise to a number of ancillary industries, which enhance the employment opportunities. Congregation of people requires consumer goods industry, retail services and a host of other activities, thus creating a node for further industrial development.

Table 17.3 Location of main industries in the North-East

Industry	Main factor of location
1. Petroleum and gas	Availability of crude in the region
2. Petrochemical industry	Availability of crude in the region
3. Chemicals and fertilisers	Availability of petroleum and gas as raw material
4. Cement industry	Availability of limestone and coal
5. Pulp and paper industry	Availability of raw material from forests
6. Plywood industry	Availability of raw material from forests
7. Silk mills	Based on local raw material
8. Sugar mills	Based on local raw material
9. Jute mills	Based on local raw material
10. Metal good industry (cutlery, small tools, furniture, cans, trailers, etc.)	
11. Tea-processing industry	Based on tea produced in Assam

17.3.1 Petroleum and Natural Gas-Based Industry

Petroleum industry in Assam is one of the oldest in the world. The well-known history of the discovery of oil in this region relates to the Assam Railways and Trading Co., which besides managing the railways owned coal mines, tea gardens and timber. While extending the Dibrugarh–Sadiya railway line to their coalfields near Ledo and to the Co's headquarters at Margherita, they noticed the oil seepage near Digboi in 1862. The first exploratory well was drilled here at Nahorpung in 1866, a few kilometres to the southeast of Nahorkatiya town. This was only 7 years after the world's first commercial oil well was drilled in 1859 by Col. William Drake in Pennsylvania, USA. The first oil well in Assam, drilled to a depth of 102 ft (32 m), proved dry. The second well drilled at Makum, around 13 km from Digboi, struck oil. It was, however, not until 1889 that the first commercially viable well was struck at Digboi, an event that proved the successful discovery of oil in Assam.

The persistent effort to continue drilling for oil is attributed to William Lake, an oil enthusiast and an engineer with Assam Railways and Trading Co. The first successful well drilled to a depth of 178 ft (55 m) turned out to be a small pocket, and it was only in 1890 when another oil well drilled to a depth of 662 ft yielded substantial oil.

The oil extracted from Makum field remained untreated till 1893, when a small experimental mini-refinery was set up at Makum (Margherita) which was later shifted to Digboi in 1901. This was the beginning of commercial exploitation, in all earnest. To manage the petroleum, refining and marketing of this oil, Assam Oil Company was founded in 1899, and the refining capacity of Digboi refinery was enlarged. This was followed by the discovery of oil in Cachar at Masunpur and Badarpur, but Barak valley had a limited reserve. The oil production declined after reaching a peak in 1920 and was subsequently abandoned.

The exploitation and refining of petroleum by Assam Oil Co., which was later taken over by Burma Oil Company in 1921, continued unabated without much increase in production and remained less than a million litres per day even till the early 1950s of the twentieth century. Since the first well was struck in 1889, over 1,000 wells have been dug. Digboi has the distinction of being the oldest oil-producing field, and the 100-year-old Digboi Refinery, still working albeit with a great deal of modification and expansion, is the oldest refinery of the world. The current production of the field is 240 barrels/day

A major advance in petroleum industry took place with the discovery of oil and gas at Nahorkatiya in 1953. With concerted efforts of Oil India and Oil and Natural Gas Commission (ONGC), many fresh discoveries were made and many more wells were drilled. More oilfields were discovered at Hoogrijan and Moran. Most of the oilfields of upper Assam, lying largely in Tinsukia district and extending into Dibrugarh, occur in a rectangular zone of about 1,000 km^2 with an east–west extent of 50 km.

17.3.1.1 Oilfields and the Mode of Occurrence of Petroleum

There are three major oilfields:

1. Digboi oilfield.
2. Nahorkatiya oilfield and its extension into Hoogrijan and Moran with an area of 1,000 km^2.
3. Rudrasagar–Lakwa–Teok–Geleki oilfield between Sibsagar and Jorhat. Of this Lakwa field is very promising and the reserves amount to around 45 million tons.

It is well known that petroleum occurs in anticlinal folds. Being lighter, it has the tendency to flow to the top. In the context of Assam, the entire petroleum deposit comes from the Tertiary, from Barails to Tipan and Girujan, i.e. from Oligocene to Mid-Miocene.

The Digboi Oilfield

The Digboi oilfield occurs in 24 different oil and sand horizons within a stratigraphic thickness of over 1,000 m (1,065 m) of Tipan sandstone of Upper Miocene. Digboi crude is mixed paraffin and asphalt base, with fair proportion of hydrocarbon.

Nahorkatiya Oilfield

Nahorkatiya oilfield, covering Nahorkatiya–Hungarijan area, in the meander belt of Burhi Dihing valley, has five main oil-producing oil-sand horizons, located within a thick stratigraphic unit of Barails, at a depth of 3,000–4,000 m.

Rudrasagar Oil and Natural Gas Field

Rudrasagar oil and natural gas field was discovered by Assam Oil Company in 1954. Rudrasagar oilfield occurs around 5 km southwest of Sibsagar and about 40 km southwest of Moran. The oil horizon is located at a depth of 3,800 m.

Lakwa Oilfield

Lakwa oilfield, about 20 km southwest of Moran, carries oil deposits in several thick sand beds of Tipan and Barail group of rocks. Oil horizon is also discovered near Geleki about 25 km southeast of Lakwa. The production at Geleki started in 1974.

Table 17.4 Production of crude oil in the North-Eastern region (in '000 tons)

Year	Arunachal Pradesh	Assam and Nagaland	Total in '000 tons
1990	43	5,076	5,119
1996	79	4,796	4,875
2001	69	5,096	5,165
2003	77	4,592	4,669
2007–2008	102	4,356	4,458

Sources:
1. Basic Statistics of North-East Region (2006)
2. For 2007–2008 Assam Economic Review, Govt. of Assam 2008

The total estimated reserve of crude oil and natural gas given by Das Gupta and Biswas (2000) is as follows:

Crude oil	148 million tons
Natural gas	159 billion cubic metres (the natural gas estimate is revised to 247 billion m^3)

17.3.1.2 Production and Refining

Assam produces around five million tons of crude annually (Table 17.4). The oil-fields extend on to the margin of Arunachal Pradesh and Nagaland. Thus, the entire amount of crude oil does not exclusively occur in Assam, and could be credited partly to Arunachal and partly to Nagaland.

The annual production of crude is subject to fluctuations, which are caused by non-continuity of the drilling operation, labour trouble, occasional disruption in transport of crude to the refinery or the damage caused to the plant or the pipeline. This leads to a shutdown of drilling and associated activities, affecting the production of crude oil. In 2007–2008, the total production of crude oil in the country was 34.118 million tons of which around 13 % was produced in the North-East region (Table 17.5).

Roughly, two thirds of total crude oil production in the country comes from the offshore region of Bombay High, which produces around 23 million tons of crude oil annually.

17.3.1.3 Natural Gas Production in the North-East Region

There has been a progressive increase in the production of natural gas in India from 17,998 million m^3 in 1990–1991 to 32,274 m^3 in 2007–2008. There has been a corresponding increase in the production of the North-East region, where the natural gas is produced in Assam as well as Tripura. While Assam has no exclusive natural gas fields and the gas occurs with crude in the 29 oil and gas fields, in Tripura there

Table 17.5 Production of crude oil in different states of North-East region of India and their share in Indian production (2007–2008)

States	Production in '000 tons	Percentage of country's production of crude
1. Arunachal Pradesh	102	0.29
2. Assam and Nagaland	4,356	12.76
3. Gujarat	6,177	18.10
4. Andhra Pradesh	298	0.87
5. Tamil Nadu	279	0.82
Bombay High	22,905	67.13
Total	34,117	99.97

Sources:
1. Oil and Natural Gas Commission, Govt. of India
2. Oil India Ltd.

Table 17.6 Oil and gas fields of North-East India in 2008

States	Name of the basin	Number of oil and gas fields				
		Oilfields	Gas fields	Oil and gas fields	Total number of fields	Leasee
Assam	Upper Assam	2	0	29	31	ONGC
"	A and AA	0	4	2	6	ONGC
"	Upper Assam	0	0	14	4	Oil India
"	Assam	0	0	1	1	Private/JV
Total for Assam		**2**	**4**	**46**	**52**	
Arunachal	Upper Assam	0	0	1	1	Oil India
"	AAFB	0	0	1	1	Private/JVC
Total for Arunachal		0	0	2		
Tripura	AAFB	0	9	0	9	ONGC
Nagaland	A&AA	2	0	1	3	ONGC
Grand Total		**4**	**13**	**49**	**66**	

Source: Oil and Natural Gas Commission & Oil India Ltd.
Note: *A&AA* Assam and Assam Arakan, *AAFB* Assam-Arakan fold belt

are nine exclusive gas fields, which produce only gas. The oil and gas fields in the North-East are distributed as follows (Table 17.6).

As can be seen there are 66 oil and gas fields in the North-East region, of which there are four exclusive oilfields and 13 exclusive gas fields. The remaining fields yield both oil and gas. Besides Assam, which is the traditional producer of natural gas, Tripura is another state, which has gradually stepped up its production of gas under Oil and Natural Gas Commission (Table 17.7).

The production of oil and gas in Assam is confined to two main areas. The focus of all the oil and gas producing in the region as well as the occurrence of oilfield is at Nahorkatiya, about 30 km southwest of Tinsukia and 50 km southeast of Dibrugarh. Though the original discovery of petroleum occurrence was near Margherita, a major discovery in early 1950s shifted the hub to Nahorkatiya in Dibrugarh district. Another

Table 17.7 Production of gas in the North-East region, production in million cubic metres

States		Years		
		1990–1991	2000–2001	2007–2008
Assam	Gross production	2,039	2,396	2,856
	Flared	621	219	217
	Recycled	102	–	–
	Net production	1,520	2,177	2,639
Tripura	Gross production	70	376	537
	Flared	0	0	0
	Net production	70	376	534
NE Region total net production		1,590	2,553	3,173

Source: Oil and Natural Gas Commission, Oil India Ltd. & Directorate General for Hydrocarbon, Govt. of India

field not fully exploited is the Rudrasagar field between Jorhat and Golaghat. Thus, Makum, Margherita, Digboi and Nahorkatiya in the border zone between Dibrugarh and Tinsukia have become an important industrial region.

17.3.1.4 Petroleum Refining

Petroleum refining is a complicated chemical-engineering process that involves a great deal of chemistry and engineering. Refining is a process of fractional distillation at different temperatures to separate different petroleum products like gas oil, kerosene, naphtha and gasoline. There could be other methods as well for refining and separation of petroleum products. The method of refining to be adopted depends on the quality and composition of crude, which could be normal paraffin based or naphthalene based. The heavy crude is predominantly naphthanic and rich in asphalt. In addition to hydrocarbon, compounds of sulphur are present in the crude. A specific composition, therefore, requires a suitable treatment. The most important process involved is the cracking that changes the molecular structure of the crude, changing long chain hydrocarbon molecules into shorter molecules, which have lower boiling point. The product derived from cracking process is a synthetic crude oil from which a larger amount of gasoline could be obtained.

The refineries are usually capital intensive with a greater need for skilled manpower. These are often huge complexes, as, besides refining, they are integrated to effect the treatment of crude and the storage and distribution of finished products.

The crude produced in Assam fields is presently treated in four refineries, which were sequentially set up, the Digboi refinery in Tinsukia district of Assam being the oldest. The existing refineries, their location and capacity are as follows (Table 17.8).

Digboi Refinery

Located closed to Digboi (Tinsukia district of Assam), this is one of the oldest refineries in the world. Set up by Assam Oil Co. Ltd, the refinery was taken over by

Table 17.8 Location and refining capacity oil refineries in Assam (in MMTPA)

Name of the refinery	Year of establishment	Location	Refinery capacity (MMTPA)	Owner
1. Digboi Refinery	1901	Digboi	0.65	IOC
2. Guwahati Refinery	1962	Guwahati	1.00	IOC
3. Bongaigaon Refinery & Petrochemicals (BRPL)	1974	Bongaigaon	2.35	IOC
4. Numaligarh Refinery Ltd. (NRL)	1993	Numaligarh in Golaghat district of Assam	3.00	BPO, Govt. of Assam Oil Industry, DB Oil of India, Public
Total			6.75	

Sources:
1. Public Sector Undertakings of India
2. Oil and Natural Gas Commission and Indian Oil Corporation

Indian Oil Corporation in 1981 when the installed refinery capacity was increased to 0.5 MMTPA (Million Metric Tons per Annum). This was increased further to 0.65 MMTPA in 1996. Besides refining crude, the unit has a couple of subsidiary units, like a new Delayed Coking Unit with a capacity of 170,000 TPA (Tons per Annum) which was added in 1999, and a new Solvent Dewaxing Unit for maximising production of micro-crystalline wax was commissioned in 2003.

Thus, other units associated with Digboi refinery include a Wax Hydro-finishing Unit (WHU), a Solvent Dewaxing Unit (SDU), hydrotreater and a Vacuum Residue Short Path Distillation (VRSD). The products of the refinery include, besides gasoline fuel, wax, bitumen and a range of speciality products.

Guwahati Refinery

Set up at Noonmati in the suburb of Guwahati, the capital of Assam, Guwahati refinery was the first refinery in public sector, developed in technical collaboration with Rumania at a cost of Rs. 172.5 million. Commissioned in January 1962, it has a refining capacity of 1.0 MMTPA. The associated units include a hydrotreater unit that was installed in 2002 to improve the quality of diesel and an Indmax unit for upgrading heavy ends LPG, motor spirit and diesel oil. The refinery primarily processes the crude supplied from Nahorkatiya oilfield, through a 400 km long pipeline, as well as from Rudrasagar oilfield, located in the vicinity of Sibsagar. Before transporting the oil from Nahorkatiya to the refinery at Guwahati or further west, the crude passes through a conditioning plant at Duliajan to facilitate the pumping of crude. The products of Guwahati refinery include gasoline, kerosene, diesel oil, petroleum coke, aromax, LPG and other fuels. The kerosene-refining unit, attached to the refinery, produces 40,000 tons of calcinated petroleum coke per annum.

Bongaigaon Refinery and Petrochemicals LTD (BRPC)

This is the largest refinery in Assam. Though as a company, it was incorporated in 1974, the refining complex was built in phases. The original refining capacity was one MMTPA, but it was increased to 1.35 MMTPA in 1987 and a further increase raised the refining capacity to 2.35 MMTPA. The crude to Bongaigaon refinery is supplied from Rudrasagar and Lakwa oilfields. Additional requirement of crude can be met from Geleki and Nazira oil and gas fields of the ONGC. The crude flows through a 600 km pipeline that connects Nahorkatiya with Bongaigaon, in west Assam. This is a petrochemical complex with a number of additional units like xylene, dimethyl terephthalate (DMT) and polyester staple fibre (PSF). The complex is so large with its refinery, chemical units and housing colonies that it is treated as a separate town by Census of India.

Numaligarh Refinery Ltd. (NRL)

Incorporated in 1993, this refinery located at Numaligarh in Golaghat district is also popularly known as 'Assam Accord Refinery'. The refinery has been set up as a fulfilment of the commitment made by the Government of India in the historic Assam Accord signed on 15 August 1985, at a cost of 27,240 million INR. The refinery, besides having the largest capacity (3 MMTPA) in Assam, has a complicated ownership structure in which Bharat Petroleum Corporation, Government of Assam, Oil Industry Development Board, Oil India and the Public are equity holders.

1.	Bharat Petroleum Corporation	51 % share holding
2.	Government of Assam	10 % holding
3.	Oil Industry Development Board	10 % holding
4.	Oil India Ltd.	10 % holding
5.	Public	19 % holding

The refinery incorporates the latest technology.

17.3.1.5 The Benefits of the Petroleum Industry in Assam

The importance of the oil industry to Assam is not to be seen only in terms of royalty claimed by the state and the employment to the people, but it should be considered as a catalyst in the process of state's industrialisation. A number of petrochemicals and fertiliser units are witness to the multiplication of a chain of secondary units that the petroleum industry has spawned. The industrial clusters of Assam, though of a moderate scale, owe their development to petroleum production and the refineries and are centred around them.

The four refineries listed above located in an east–west zone, running parallel to Brahmaputra, are linked by a pipeline that runs for over 1,700 km from Digboi in upper Assam to Barauni in Bihar. This 40 cm diameter pipeline first laid from Nahorkatiya to Guwahati but was later extended up to Barauni in 1963. Smooth transport through the pipeline is facilitated by a series of pumping stations. To link Bongaigaon, a separate pipeline has been laid between Nahorkatiya and Bongaigaon. Building of refineries and other infrastructure and the maintenance work, required to keep the refineries working, provides employment to many more people than the number employed in actual refining.

It has to be noted that the prospects of establishing many more chemicals and other coal- or oil-based industries need to be explored with greater application, a phenomenon that could trigger a silent industrial revolution in Assam.

Crude Conditioning Plants

Besides the refineries, there are two crude conditioning units, which process the crude and change its viscosity that is amenable to long distance transport through pipes. There are two crude conditioning plants, one located at Duliajan and the other at Moran. The former facilitates the pumping of Nahorkatiya crude, and the second at Moran is meant to lower the viscosity of oil from Moran oilfield. The process involves heating, cooling and developing a consistency that could permit flow of crude in the pipes even at lower temperature, without coagulating again. This was the problem with Nahorkatiya and Moran oilfields. The current production of the field is 240 barrels/day

17.3.1.6 Natural Gas and Gas-Based Enterprises

As seen earlier, the North-Eastern region of India produces over 3,000 million m^3 of gas, much of it drawn from the 50 oil and gas fields of upper Assam, a single field in Arunachal Pradesh, nine gas fields in Tripura and three in Nagaland. Most of these fields yield both, oil and gas, except Tripura, which has exclusive gas fields. The major gas reserves are in Nahorkatiya and Moran fields. The most promising gas fields in Assam are Nahorkatiya and Moran oilfields, which produce over 70 % of the supply of gas in the region. The composition of gas found at Nahorkatiya and Moran is as follows:

Composition of Natural Gas at Nahorkatiya and Moran

Gas	Percent
Methane	90.40
Ethane	0.47
Propane	2.84
N. Butane	0.65
Others	0.56

The discovery and exploitation of gas in Assam gave rise to the incorporation of Assam Gas Co. aimed at marketing and distribution of gas. The gas is utilised for generating power, producing fertilisers and supplying gas to tea estates. The three industrial units, which use the natural gas, are:

1. Assam gas-based power plant at Bokuloni (Dibrugarh district)
2. Fertiliser factory at Namrup
3. Tindari gas grid that supplies gas to the tea estates of Tingari circle

Assam Gas-Based Power Plant

Utilising the gas produced at Nahorkatiya and Moran, power is generated at a place called Bokuloni village, in Dibrugarh district, about 35 km from Tinsukia and 14 km from Duliajan. The plant has an installed capacity of 291 MW, with six gas turbines, each with a capacity to generate 33.5 MW electricity, and three steam turbines each with a capacity of 30 MW. The natural gas, the basic fuel, is supplied by Oil India Co. from Nahorkatiya, and water is available from Burhi Dihing river. The generation of power in this plant has gradually risen from 336 MU in 1995 to 1,767 MU in 2008. Connected to the grid, all the states of the North-Eastern region are the beneficiaries of this project.

Agartala Gas Turbine Power Plant

The project utilises the locally produced gas from the natural gas fields of Tripura. Located at Ramchandranagar, near Agartala, the plant has a capacity of generating 21 MW power. The production started in the late 1990s and the electricity produced in 2008–2009 was around 660 MU.

Other Gas-Based Industries

Assam Petrochemicals Ltd.

Located at Parbatpur, just a few kilometres east of Namrup, the petrochemical plant produces methanol from gas. Methanol is a building block for many chemical industries. An important liquid, it can be converted into a number of chemicals like DMT (polyester intermediary), formaldehyde, fertilisers, pesticides, paints and biodiesel and is occasionally used for drugs. The plant has a capacity of 33,000 tons per annum for each, methanol as well as formalin. The value of annual turnover in 2005–2006 was 560 million INR (Indian rupees).

Namrup Fertiliser Factory

Owned and operated by Fertiliser Corporation of India, the factory uses the natural gas supplied by Oil India from its oil and gas fields, through Assam Gas Company,

which functions as a distribution agency. The factory is designed to produce 55,000 metric tons of urea and 100,000 metric tons of ammonium sulphate. The factory is well designed to be expanded further. The fertiliser plant is a model of effective utilisation and recycling of the production. The natural gas, produced at Nahorkatiya, is used as a fuel for generating power and as a raw material for petrochemical industry and the fertiliser plant. Much of this fertiliser is used in Assam, and easy availability of fertiliser is a productivity booster for the crops, particularly those grown during wet season or enjoying the benefits of irrigation.

17.3.2 Power Generation

The earlier discussion of energy resources (Chap. 8), their occurrence, distribution, reserves and production centred around mineral resources like coal, petroleum and gas, with some observations on hydroelectricity potential in the region. For long, humanity, in any part of the world, has been burning wood, coal and subsequently oil directly to obtain energy. Subsequently, a series of inventions in the nineteenth century, like steam engines for railways and ships, finally led to the conversion of solid or liquid fuel into electricity for final use. Today, use of electricity, as a source of power, is the preferred mode of energy in most spheres of life, and the direct use of coal as a fuel is limited to a few heavy industries. Petroleum and gas are used in land, water and air transport.

The greatest advantage of using electricity is its zero bulk and easy and quick transmissibility. Though the initial cost of conversion from solid, liquid or chemical fuel to electricity is high, the pollution-free transport and use of electric power make it economical. It is amenable to use anywhere for most purposes and can be transmitted over thousands of kilometres with the flick of a button. Thus, all over the world, direct use of coal, petroleum, gas or even nuclear power is avoided, and these are converted into electricity, a preferred medium of energy.

The North-East region of India has good reserves of coal, petroleum and gas and has an unbeatable position vis-à-vis other states in hydroelectric potential available in the country. It has a reserve of 152 billion cubic metres of natural gas, capable of generating 3,000 MW electricity for 30 years, and 945 million tons of coal, equivalent to 0.5 % of the coal reserves of the country. The estimated hydropower potential of the region is over 55,000 MW (58,971 MW – according to Central Energy Authority), which is roughly 40 % of the total water-power potential of India. Thus, North-East region is by far the richest region in India, as far as energy resources are concerned

The exploitation of these reserves and particularly the generation of electric power have been unsteady and slow, as is the situation elsewhere in India. But the region has made steady progress during the last 50 years, and a number of power plants have emerged, generating power that is transmitted all over the region over electric grid lines.

17.3.2.1 Brief History of Power Generation in the Region

As elsewhere in India, the peasantry in the region was using kerosene for lightening, and for long, even the small towns used kerosene lamps before power generation started. The first set of generators that were installed were mostly diesel based. Diesel generators produced electricity at district headquarters like Goalpara, Kokrajhar, Dhubri and Mankachar, west of Guwahati, besides Dhekiajuli, Chirali and Mangaldai. The power requirement of the eastern part of the region, specifically Assam, was met by power-generating stations operated by railways, collieries, and oilfields, all of which had their own power plants. The tea estates in the region had their own generating sets and produced limited power for their own use.

With the establishment of Assam State Electricity Board (ASEB) in 1958, a semblance of organised power generation appeared. The entire North-East, with the exception of two princely states of Tripura and Manipur, and the frontier area of what is presently Arunachal Pradesh, coincided with Assam. The ASEB started with a number of thermal stations, usually operating generators based on diesel.

The four major projects that were started by ASEB in the 1960s of the last century were (1) Namrup Thermal Power Project; (2) Garo Hills Power Project; (3) Guwahati Thermal Power Project, located at Chandrapur; and (4) Umiam Hydroelectric Power. Most of the private thermal power-generating units were taken over by the ASEB, which started a systematic laying of power houses, transmission lines and a distribution network. An important thermal plant that used coal, imported from Bihar, was at Bongaigaon. It was the largest thermal unit in the North-East region with an installed capacity of 240 MW.

Discovery of Gas and Its Use in Generating Power

The discovery of large amount of gas in Nahorkatiya and other oil and gas fields in the North-East opened a new vista for generation of electricity in the neighbourhood without entailing much cost. The thermal power plant at Namrup using natural gas and another at Tripura are examples of gas-based power projects. Presently, the focus is on major projects and their locations. Today, the important thermal stations are located at Bongaigaon, Namrup, Lakwa, Kathalgiri, Geleki and Amaguri in Assam and Ramchandranagar in Tripura

17.3.2.2 Hydroelectric Power Projects

With mountainous relief and heavy rainfall spread over several monsoon months, North-East region holds the highest hydropower potential of the country. The current estimate of 55,000 MW is not final and varies with the year and the agency that evaluates the potential. Undoubtedly, the most endowed region is Arunachal Pradesh where the tributaries of Brahmaputra originating in the Himalayan heights flow in a steep longitudinal profiles, descending a height of 3–4,000 m over a distance of 200 km, providing

substantial head for the generation of hydroelectric power. These water courses could be, and are proposed to be, dammed at multiple points, for the generation of hydroelectric power. So far, only a couple of projects are completed, but there are several ongoing projects on different river valleys of Arunachal Pradesh. Though not comparable to Arunachal Pradesh, the states of Nagaland Manipur, Mizoram, Meghalaya and Tripura have a relief that is favourable to hydroelectric power generation. Even in Assam, river Kopili has been harnessed for water-power generation, with the dam site and power-generating stations located in the hilly North Cachar district.

17.3.2.3 Power-Generating Projects in the North-East Region

Power generation in the North-Eastern region, before 1950, was through small thermal plants using diesel oil as fuel. These power-generating sets were widely scattered, almost in every town, operated by a private companies. In the North-East region of Assam, the Assam Railway and Trading Company produced some power. The state of Assam had an installed capacity of 14 MW, hardly enough for lightening, let alone any industrial development. The situation changed after 1950, when the Government of Assam constituted a department of electricity in 1951, which was later transformed into Assam State Electricity Board.

The Early Hydroelectric Projects: Umtru and Umiam

The Assam State Electricity Board, besides setting up a few additional thermal units in different parts of the state, embarked upon some major projects like Umtru river project (then in Assam, now in Meghalaya) and Umiam Hydroelectric project, 30 km north of Shillong, to augment the power-generating capacity of the state. The two hydel projects, Umtru with an installed capacity of over 8 MW and Umiam with an installed capacity of 26 MW, added 35 MW of installed capacity to the state's existing power-generation potential. After the formation of Meghalaya, Umiam and Umtru hydroelectric power stations were transferred to Meghalaya. Assam had an installed capacity of around 170 MW in 1970, a considerable addition to the 14 MW capacity in 1957, yet it needed to develop a number of additional generating stations to meet its growing requirement (Fig. 17.1).

Within a period of two decades, Assam developed the thermal stations listed in Table 17.9.

In addition, the development of Kopili hydroelectric Project by North Eastern Electric Power Co. (NEEPCO), a public sector enterprise of the Central Government, added another 200 MW to the power-generating capacity of the state. Another major thermal power station commissioned by NEEPCO is Kathalguri Thermal Power Plant, with an installed capacity of 294.66 MW, one of the largest in the state. Thus, besides the abovementioned thermal power stations operated by Assam Electricity Board, the three central projects built by NEEPCO in Assam are as follows (Table 17.10).

The total installed capacity of Assam, as developed by Assam State Electricity Board, as of 31 March 2004 was 621.70 MW. To this must be added the installed

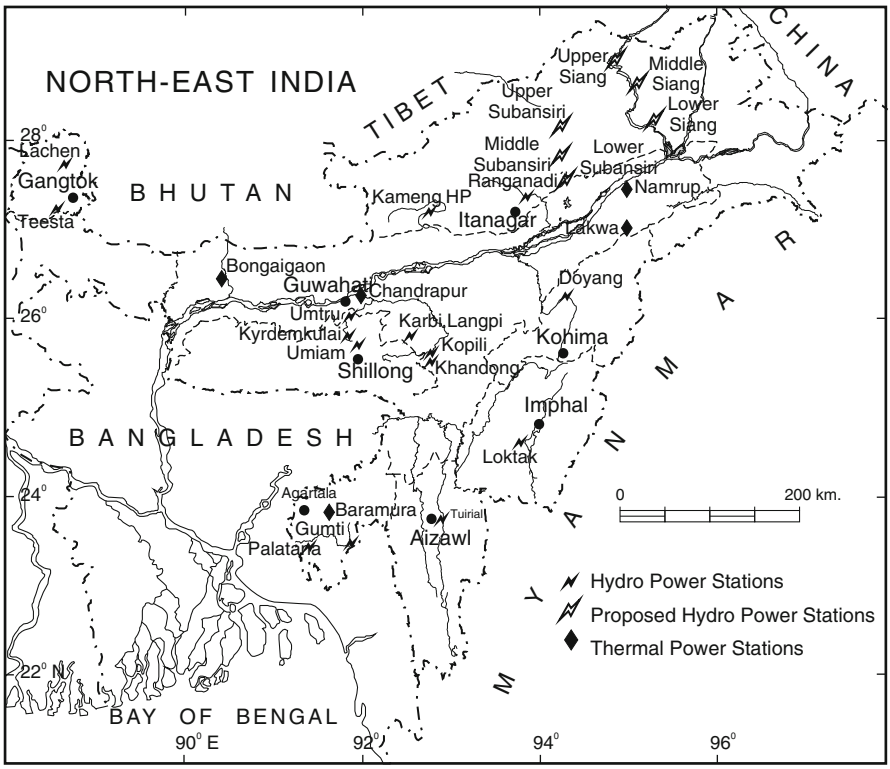

Fig. 17.1 Hydro and thermal power stations in North-East India

Table 17.9 Power stations operated by Assam Electricity Board

	Thermal power stations	Installed capacity (MW)
1.	Bongaigaon Thermal Power Station (BTPS)	240.00
2.	Guwahati (Chandrapur) Thermal Power Station	60.00
3.	Namrup Thermal Power Station	111.50
4.	Namrup Heat Recovery Thermal Powers Station	22.00
5.	Lakwa Gas Thermal Power Plant	120.00

Source: Government of Assam, Economic Survey (2006–2007) Directorate of Economics and Statistics, Government of Assam, p. 60

Table 17.10 Power stations operated by North Eastern Power Company

	NEEPCO power stations	Installed capacity (MW)
1.	Kopili Hydroelectric Project	275.00
2.	Kopili Hydroelectric Project Stage II	25.00
3.	Assam Gas-Based Thermal Power Project	291.00
4.	Kathalguri Thermal Power Project	294.66
5.	Margherita Coal-Based TPP Power Generation	480.00

Source: North-eastern Electric Power Corporation Ltd. (NEEPCO) http://www.neepco.gov.in/kopili.html (23-05-2009)

capacity of the Kopili and Khamdong hydroelectric projects, which together contribute 275 MW. Besides Assam gas-based Kathalguri thermal power project and Amalguri combined-cycle plant, both undertaken by Assam State Electricity Board, are to be completed soon and will further add to the installed generation capacity of the state.

17.3.2.4 Outline of Some Major Power Generation Projects in Assam

Bongaigaon Thermal Power Station (BTPS)

With an installed capacity of 240 MW, this is the largest power station in Assam, located at Nandangeri hill a little distance from Bongaigaon, a district headquarter in lower Assam. The power plant uses coal brought from the collieries of Bihar and Bengal, avoiding the coal from Assam coalfields, which have a higher sulphur concentration. The thermal plant at Bongaigaon is being scaled up into a mega power project, with an installed capacity of 500 MW.

Chandrapur Thermal Power Plant

Located in the vicinity of Guwahati and commissioned in 1972, the plant has an installed capacity of 60 MW. The project had the benefit of working as an integrated system with Umian power station, now in Meghalaya, to maximise power distribution to both the states, viz. Meghalaya and Assam. Before the commissioning of Bongaigaon thermal power station, Chandrapur thermal plant and another at Namrup with 111.6 MW capacity, in Dibrugarh district, were the main generating stations in the state.

Namrup Thermal Power Station

Commissioned in 1965, at Namrup, about 35 km south of Tinsukia, the plant has an installed capacity of 111.5 MW, with a provision for further up-gradation. Unlike Bongaigaon, Namrup plant utilises the natural gas produced in Nahorkatiya oil and gas field. The plant utilises 500,000 m^3 of natural gas per day. It has facilitated the establishment of a number of industrial units like Namrup Fertiliser Co. in the vicinity. Power from the complex is made available to industrial units, railways and tea estates, besides domestic consumers.

Namrup Waste Heat Thermal Plant

With an installed capacity of 22 MW and run by Assam State Electricity Board, the plant utilises the heat recovered from major power stations.

There are several other gas-based power plants in North-East Assam, the largest of which is the Lakwa gas-based plant, with an installed capacity of 120 MW. The plant employs a number of turbines with 15–20 MW generating capacity.

17.3.2.5 Centrally Commissioned Power Projects in Assam

Out of the projects mentioned above, there are some which are investigated, financed and executed by Central Government agencies, viz. the National Hydel Power Commission (NHPC) and North Eastern Electric Power Corporation (NEEPCO). The following are the centrally sponsored power projects.

Kopili Hydroelectric Project (275 MW)

Harnessing the swift water of river Kopili and the relief energy of the terrain in North Cachar Hills, the Kopili Hydroelectric Project was the first venture of NEEPCO, after it came into existence in 1976. The project involved the construction of two dams, one on the river Kopili and the other on Umrong, a tributary of the former. The water from the resulting reservoir is taken down the slope, in a 2,759 m long tunnel in the case of Kopili and a 5,473 m long tunnel in the case of Umrong. The dam on Kopili is 30 m high, whereas on Khandong the dam height is 66 m. The plant is located at Umrangso, North Cachar Hills, at a distance of 140 km from Shillong and 70 km from Lanka railway station, a location not very accessible. The plant was completed in stages in a period of two decades. The first generating unit (Khandong Unit I) was commissioned in March 1984 and the last, Kopili Stage II, in July 2004, bringing the total installed capacity to 275 MW.

Assam Gas-Based Thermal Power Plant (AGTPP, Installed Capacity 291 MW)

This gas-based plant, utilising the natural gas received from Nahorkatiya field, is located at Bokuloni village in Dibrugarh district, about 35 km from Tinsukia, 14 km from Duliajan and 64 km from Dibrugarh. Having the advantage of local gas from Nahorkatiya, a few kilometres away, and plenty of water from Burhi Dihing, and producing progressively increasing amount of power, reaching its peak capacity, the plant is considered a ‘centre of excellence’ by the Ministry of Power. This is a combined-cycle gas turbine project, with nine units that include six gas and three steam turbines. The first unit was commissioned in 1995 and the last in 1998. With an installed capacity of 291 MW, the plant generated 1768 MU in 2008–2009.

17.3.2.6 Power Projects in Other States of the North-East

Arunachal Pradesh

The state has been depending on diesel-generating sets for its requirement of power, but today it has a total installed capacity of 59.4 MW which includes 27.12 MW created by diesel sets and 32.28 MW of hydroelectricity.

Ranganadi Hydroelectric Project

It is the first large-scale hydroelectric project of Arunachal Pradesh. The project is on Ranganadi, a tributary of Subansiri river, at Yazali, about 40 km north of Itanagar in Lower Subansiri district. The project involves a 68 m high concrete dam, a 10 km long race tunnel of 6.8 m diameter, giving the generators a head of 304 m with an installed capacity of 405 MW (three units with a capacity of 135 MW each). The project is generating 1,568 MU of electricity annually.

Power Generation in Nagaland

Nagaland depended on diesel generators and small hydroelectric projects including the one at Likimro, which was commissioned by the State Government with an installed capacity of 16.0 MW. Thus, by 2004 the installed capacity in Nagaland reached almost 100 MW. The commissioning of Doyang Hydroelectric Project in 2000, added to the power-generating capacity of the state. By the year 2004, the installed capacity in Nagaland reached almost 100 MW.

Doyang Hydroelectric Plant

This is a NEEPCO project (75 MW) on Doyang river, the most important river of western Nagaland and a sub-tributary of Brahmaputra. Located in Wokha district, at a distance of 30 km from Wokha town, the project involved the construction of an 87 m high dam, having a length of 428, and 462 m long tunnel with a diameter of 6 m, giving the powerhouse a head of 67 m. Presently, the plant generates 250 MU of electricity every year.

Manipur

The state-sponsored electricity projects in Manipur were not many. A few micro hydroelectric projects had an installed capacity of 2.8 MW, and another 9.3 MW capacity was added by diesel generators. The state benefits greatly from the Loktak project. During the last few years, the state has added to its generating capacity by commissioning a few thermal stations, bringing the installed generating capacity to 47 MW.

Loktak Hydroelectric Project, Manipur (Installed Capacity – 105 MW)

A major hydroelectric project in North-East India, the Loktak power project was executed by National Hydel Power Corporation (NHPC). The project lies in Churachandpur district of the state, about 35 km south-west of Imphal and about 8 km southwest of Bishnupur. It was commissioned in 1983 with an installed capacity of 105 MW. The project involved the construction of Ithai barrage across

Manipur river, having a length of 58.8 m and a height 0.7 m, with a 6.62 km long race tunnel having a diameter of 3.8 m. The powerhouse, with three generating units of 35 MW each, is located on the bank of Leimatak river. Loktak downstream project, an extension of Loktak project, with an installed capacity of 90 MW will improve the power situation of the state.

Mizoram

The state with a total installed generating capacity of 24.5 MW, 80 % of which is thermal, has launched a number of projects, for additional power. The state has three projects under construction:

1. Tuirial Power Project 60 MW
2. Tuirini Power Project 35 MW
3. Tuivall Power Project 35 MW

Of the three projects under construction, one is being executed by North Eastern Electric Power Corporation (NEEPCO).

Meghalaya

Next to Assam, Meghalaya has a better developed power situation. Almost the entire power generated in Meghalaya comes from hydroelectric sources. The installed capacity of 185 MW in the state comes from five hydroelectric projects given below.

	Hydroelectric project	Installed capacity (MW)
1.	Umtru	11.2
2.	Umiam Stage I	36.0
3.	Umiam Stage II	18.0
4.	Kyrdemkulai Stage III	60.0
5.	Umiam Stage IV	60.0
	Total	185.2

Source: Govt. of Meghalaya (2003)

It needs mentioning that Meghalaya is the beneficiary of an early start of water-power development projects, initiated by its predecessor state, Assam. The Umtru hydroelectric project was commissioned by Electricity Department of Assam in 1957, which was further enhanced by Umiam Stage I, which was commissioned in 1965 with an installed capacity of 26 MW. Meghalaya, thus, inherited the two early hydroelectric projects from Assam, following the division of Assam and emergence of Meghalaya as a separate state. Additional capacity was added and the power position of the state improved considerably. The state still depends on the expansion of the existing hydroelectric power, and Umiam–Umtru Stage V, with an installed capacity of 30 MW, is under way.

Tripura

Much of the power produced in Tripura comes from thermal sources, though there are two hydroelectric power sources, viz. the Gumti Hydroelectric Project and the Maharani Project; the latter project is not very reliable, and Gumti power-generating station remains the sole hydroelectric power of the state.

Much of the thermal power of the state is based on gas as fuel, and only a small generation capacity comes from diesel sources. Natural gas in the state comes from the gas deposits in Tertiary rocks discovered by the Oil and Natural Gas Commission of India. The gas field in Tripura could be an extension of gas field in Bangladesh.

	Tripura's power-generating projects	Installed capacity (MW)
1.	Gumti Hydroelectric Project	15.0
2.	Maharani Hydroelectric Project	1.0
3.	Baramura Gas Thermal Project	37.5
4.	Rokhia Gas Thermal Project	69.0
5.	Diesel-generated power	6.1
	Total	128.6

Source: Basic Statistics of North-East Region (2006) North-eastern Council Secretariat, Shillong, table 225, p. 263

Besides these state-run projects, North Eastern Electric Power Corporation produces power at its Agartala Gas Turbine Power Plant located at Ramchandranagar, Tripura West. The plant, commissioned in 1998, has an installed capacity of 84 MW, with four turbines each capable of producing 21 MW of power. The plant uses natural gas produced locally. Tripura, as a state, seems to have taken full advantage of the natural gas produced locally.

The most ambitious power project in Tripura is the Palatana gas-based thermal power project with a proposed installed capacity of 750 MW. Executed by the Oil and Natural Gas Commission of India, it is a mega power project that would not only eliminate the power shortage in the North-East region, but would be able to transmit power even to other states of India.

17.3.2.7 Prospects of Power in the North-East Region

All the three sources of power, coal, natural gas and hydroelectric power, are available in the North-Eastern region. While the gas-based plants are being operated in Assam and Tripura, hydroelectric power is the main source of energy in Meghalaya and Arunachal Pradesh.

Arunachal Pradesh is the storehouse of hydroelectric power. The region has been investigated for a series of projects that could add well over 45,000 MW of power-generating capacity. To illustrate the seriousness of the energy planners, some of the projects that are investigated and are at different stages of finalisation are given in Table 17.11. In this context, the North East Electric Power Corporation has been assigned the task of preparing feasibility reports for 15 large projects in Arunachal Pradesh and 3 in Nagaland.

Table 17.11 Schedule of hydroelectric power projects in the North-East region

	State	Name of project	Installed capacity (MW)	Agency
1.	Assam	Dhansiri and LBP	120	State
2.	Assam	Karbi Langpi (lower Barapani)	100	State
3.	Assam	Kopili Stage II	25	NEEPCO
4.	Nagaland	Likimro	24	State
5.	Manipur	Loktak Downstream	90	NHPC
6.	Arunachal P.	Ranganadi	405	NEEPCO
7.	Sikkim	Rolep-I	9	State
8.	Sikkim	Teesta Stage V	510	NHPC
9.	Mizoram	Tuirial	60	NEEPCO
10.	Mizoram	Tuirini	35	CWC
11.	Mizoram	Tuivall	35	CWC
12.	Meghalaya	Umiam–Umtru Stage V	30	State
13.	Arunachal P.	Kameng	600	NHPC
14.	Arunachal P.	Pare (also called Dikrong)	110	NEEPCO
15.	Arunachal P.	Lower Subansiri	2,000	NHPC
16.	Tripura	Palatana	750	ONGC

Sources:
1. National Hydroelectric Power Company, India (NHPC)
2. North-east Electric power corporation (NEEPCO)
3. National Thermal Power Station, India (NTPC)

Besides these projects, some of which are close to completion, there are a large number of large hydroelectric projects in the North-East region which are being pursued vigorously by different authorities at the state and national level.

Large Power Projects Under Construction and Development

For some time, hydroelectric power potential of the North-East, and particularly Arunachal Pradesh, is much in focus, and many projects are either under construction or in the process of development.

Projects Under Construction in Arunachal Pradesh

Every river of Arunachal, starting from Lohit on the east to Kameng and Tawang in the west, has some power potential. This is assured by heavy monsoon rainfall, ranging between 2 and 4,000 mm that shows in the voluminous discharge of the rivers of Arunachal. Besides, the relief of the region characterised by swift flowing streams emerging from the high ranges of the Himalayas, sometimes reaching 5,000 m ASL and joining the Brahmaputra in Assam, flowing at barely 100 m ASL provides the necessary kinetic energy. Within a short distance of about 200 km, these rivers descend a vertical distance of over 3,000 m in the plain of

Assam. Of these, the Siang (known as Brahmaputra in Assam) and the Subansiri are the most prominent. The estimated potential of these rivers is as follows:

	Project on Siang river	Estimated installed capacity (MW)
1.	Upper Siang Project	11,000
2.	Middle Siang Project	700
3.	Lower Siang Project	2,000
	Total estimated potential	13,700

Source: NHPC, National Hydroelectric Power Corporation of India Ltd.
Remarks: Brahmaputra in Arunachal Pradesh is known as Siang

In the case of Subansiri, which does not have a large course in Tibet plateau, the estimated potential for generating hydroelectricity is as follows:

	Project on Subansiri	Estimated installed capacity (MW)
1.	Upper Subansiri Project	2,000
2.	Middle Subansiri Project	1,600
3.	Lower Subansiri Project	2,000
	Total potential	5,600

Other major projects under development	Estimated installed capacity (MW)
1. Lachen (Sikkim)	210
2. Tawang I (Arunachal Pradesh)	750
3. Tawang II (Arunachal Pradesh)	750
Total potential	1,710

Source: National Hydroelectric Power Corporation India

Of these, only the Lower Subansiri Project is under construction; the others are in the process of development. Another project under construction is Pare hydroelectric project on the river Dikrong. Also known as Dikrong project, it is located 5 km downstream of Ranganadi project I. The four mega projects of the region, mentioned below, were expected to be completed and start generating power by 2012. There is, however, no sign of their completion. What has retarded the progress of these projects is the opposition from social activists raking up a variety of issues. These include damage to environment, threat to the livelihood of local communities or the impact of the project on fishing and agricultural activities in the downstream section of the catchment. Sometimes, even the people of a neighbouring state, in the lower part of the basin, rise in revolt out of a perceived, though unconfirmed, threat to the ecology of their state and its adverse impact. Many environmental issues, some genuine but quite a few baseless, encountered in every major project, are raised and backed by protests, demonstration and even stoppage of work on the projects.

Constraints in the Development of Hydroelectric Power

One might imagine that the difficult terrain, inaccessibility and inadequacy of finance or non-availability of technical expertise may be the reasons for the slow

development of hydroelectric power in the North-East. But these constraints, though impeding progress, are not as formidable as the concern for the environment and noise of environmentalists. There is no hydroelectric project where objections, protests through media and strong lobbies of environmentalists are not encountered. The clearance in most cases is inordinately delayed. It is understandable that national or international funding agencies don't readily agree to finance the project, in the absence of all types of clearances that are required before the work on the projects stars. The protests from different quarters are often a major reason for the delay in executing the projects.

The formulation of the project, after survey and fixing the site, takes time. And once the plan is ready, these are scrutinised and revised several times before these are sent for extra departmental clearance. Even after the projects have crossed all the hurdles, administrative and financial, obstructions are encountered on the site of the projects. Difficulty created by local inhabitants poses another hindrance. The problem of submergence of land, value of compensation and rehabilitation of the villages pose another major challenge. In the case of the largest of the projects, i.e. upper Siang project, the building of a dam by the Chinese on Tsangpo in Tibet, impounding large volume of water, will directly affect the discharge and the reservoir capacity of projects downstream, especially the upper Siang project. This has forced the Indian planners to think afresh about the site and the power-generating potential of the project. Some of the projects of Arunachal Pradesh are likely to be shelved for some time.

Every time a dam is contemplated, the spectre of flood starts haunting the project, and one and thousand evils of large dams, which may not apply to a specific project, are pointed out. Unstable political conditions also come in the way of speedy execution of these projects. A case in point is the famous Tipaimukh project, on Manipur–Mizoram border, having an installed capacity of 1,500 MW. It is stalled primarily because of opposition from Bangladesh through which the river flows in its lower part, but no less because of discordant voices from different groups of activists in the region and the tension created by local militant groups.

17.3.3 Forest-Based Industries

Besides lumbering as an industry to extract timber and fuel from the forests, there are many processing industries that depend for their raw material on forests. Two of the most well-known industries in the region that depend on the forest for their raw material are (1) plywood industry and (2) paper and pulp industry. Besides, there are minor products, like gum, fruits, medicinal herbs and leaves, collected from the forests, but they don't provide raw material for well-established large-scale industries.

17.3.3.1 Plywood Industry

No other region of India is as well known for plywood and tea chests as North-East India. It should be clear that plywood is made after digesting the woody and

forest material in high-pressure digesters and then set in uniform plies to take the form of plywood. It is a simple transformation of woody mass into plies and sheets compacted together from the hard and compact wood. The plywood is a suitable finished product for making boxes, chests, furniture and a variety of utility goods. The tea industry in Assam provided a market and was an inducement for the development of plywood industry, as the tea for long distance transport was packed in plywood chests.

The first plywood factory, called Assam Saw Mill and Timber Co., was started at Kobo near Sadiya in 1920. This was followed by an increasing number of plywood factories, almost all of them in the North-Eastern part of Assam, at Tinsukia, Ledo, Makum, Jaipur and other places. Assam has around four dozen plywood factories, which is half the number of total plywood factories in the country. The industry produces around 40 million m^2 of plywood. The centre of production is Tinsukia and the surrounding towns. The industry has remained frozen in location in North-Eastern Assam because of the facility of transport. Plywood is a bulky product and requires a long haul to different parts of the country. Despite there being abundant forests in other parts of the region, plywood industry has not developed elsewhere. A factory processing forest-based products is located at Mon in Nagaland, but it hardly produces any plywood. Outside Assam, plywood factories are established in Meghalaya and Arunachal Pradesh. The Meghalaya Plywood Factory is the largest enterprise in the state employing 500 persons and producing 2 million m^2 of plywood. Similarly, small plywood and veneer factories are established at Tezu in Lohit district, taking advantage of local forests.

17.3.3.2 Pulp, Paper and Paperboard Industry

Paper industry requires cellulosic raw material that is derived from any fibrous organic material like rags, cotton, jute, bamboo, crop residues and any other woody material. Besides, a paper factory needs large volume of water. Cellulose derived from cotton rags is the best material for good quality paper, but it is prohibitively expensive. It is the length of fibrils (smaller constituents of fibre) that provides strength to the paper, as the fibres, during the process of papermaking, get interlocked to provide the necessary strength to any paper. In contrast, the woody or the entire vegetative materials of the forests, with the exception of bamboos, have a relatively low content of the cellulose, and that too of lower fibre length. Hence, the paper produced from the forests, without losing much weight, following a chemical treatment, is of a relatively poor quality. The chemical treatment required for manufacturing paper varies with the raw material, the lesser the cellulose content in a woody mass, the greater the chemical treatment for washing away the non-cellulosic material. The forest wood contains a lot of the non-cellulosic materials like lignin, and these have to be removed from the mass of digested material. In the process, paper factories require enormous volume of fresh water. The presence of forests and the availability of large volume of water make the region a favoured one for the manufacture of pulp and paper. Not all the paper-producing units in the

North-Eastern region produce pulp and paper together; some of them produce paper and paperboard from the pulp obtained from other manufacturing units. The region has rich forests abounding, among other varieties of trees, in bamboo stands that make good quality paper, especially craft paper.

17.3.3.3 Paper Factories in the Region

Ashok Paper Mills Ltd.

Ashok Paper Mills Ltd. Located at Jogighopa in Bongaigaon district, Ashok Paper Mills was one of the earliest paper factories in the North-Eastern region. Located close to Brahmaputra river and not too far from Naranarayan Setu, the factory started functioning in the early 1970s. Using bamboo as a raw material which is supplied from the bamboo plantations, specifically raised for this purpose, the factory has a capacity to produce 100 tons of pulp and 90 tons of paper per day. The factory, unfortunately, has run into frequent controversies, labour trouble, litigation and closure.

Paper industry has attracted public sector undertakings in the region. Besides several minor projects, there are three major paper-producing factories in North-East India. These are:

1. Nagaland Pulp and Paper Company Ltd.
2. Nagaon paper Mills
3. Cachar Paper Mills

Nagaland Pulp and Paper Company Ltd.

Located at Tuli in Mokokchung district of Nagaland, barely 5 km inside Assam–Nagaland border, the factory is a joint venture between Hindustan Paper Corporation, a Government of India enterprise, and the Government of Nagaland. Started in 1971, it has a capacity to produce 100 tons of writing, printing and craft paper per day. The mill utilises the bamboo resources of the region. Once closed due to losses, the Central Government has restarted the project with a revival package including a 15 MW power plant.

Nagaon Paper Mills

Owned by Hindustan Paper Corporation, a public sector enterprise, the factory is located at Jagiroad (Morigaon district of Assam). Started in 1985, the mill has the capacity to produce 100,000 metric tons of writing and printing paper annually. As a factory, the mill is known for its efficiency, particularly its energy conservation programme. In 2006–2007, it produced 105,160 metric tons of paper. Local raw material and accessibility to markets are important factors that determined the

location of the mill. Besides getting raw material from other areas, the mills obtain bamboo and other woody material from Sonakuchi forests, which lie in the vicinity. The location of Jagiroad on the main North-East railway as well as on NH 37 has been a crucial factor in choosing the site for this plant.

Cachar Paper Mills

The factory, at the time of its establishment, was in Cachar district and was named Cachar Mill after the name of the district. After the division of the district into three parts, viz. Cachar, Hailakandi and Karimganj, it fell in Hailakandi district, a district sandwiched between Karimganj in the west and Cachar in the east. The mill located at Panchagram, a town on the southern bank of Barak, and on Silchar–Karimganj railway line, has all the advantages that a paper mill can expect. It has abundant water supply, drawn from Barak, and the extensive bamboo stands in the neighbourhood, in the forests of Cachar and Mizoram, supply the necessary raw material. The densely populated districts of south Assam provide the required labour. The plant has the capacity to produce 100,000 tons of paper annually, and employs over 1,200 persons.

17.3.3.4 Minor Forest-Based Industries

These include collection of gum and lac, but one that is important in Mizoram, Nagaland and Meghalaya is the production of essential oils, aromatics and chemicals. The raw material for these products is citronella (*Cymbopogon nardus*) and cinnamon. This has, however, remained a cottage industry. It may be mentioned that Nagaland has established a citronella production-cum-training centre at Dimapur.

17.3.4 Bamboo and Bamboo-Based Industries

Bamboo constitutes a major forest resource in the North-East. The North-Eastern region abounds in bamboo. Bamboo, classified as grass, occupies the blank patches that develop following the burning of forests for shifting cultivation. Since *jhuming*, a regional term for shifting cultivation, has been practised in the region for millennia, many forest areas have turned into extensive bamboo stands.

The state most important for bamboo is Mizoram. Bamboo forests cover an area of 125,400 ha in the state, producing 3.2 million tons of bamboo every year, of which a very small fraction, not exceeding one percent, is used locally. With a short growth cycle of 4 years and growing rapidly, sometimes 60 cm a day, clumps of bamboo fill in the clearings that are left as fallow, in the sequence of shifting cultivation. This assures a perpetual supply of bamboo at a definite rate.

Besides bamboo, bamboo strips and fibres are used in a variety of ways like baskets, mugs, hats, fishnets, pipes and toys, but the major use of bamboo in the state is for house making and furniture. All these uses consume a small part of the bamboo produced locally. Much of the bamboo in all the states of the region feeds the paper industry in the region and even other parts of India. The annual value of export of bamboo from Mizoram is around INR ten million. The state has set up a bamboo-processing plant at Sairang, about 10 km north-west of Aizawl, with the support and guidance of the National Mission on Bamboo Application (NABM) and National Bamboo Development Agency (NBDA).

Other states of the North-East region, though not as rich in bamboo as Mizoram, are also striving to increase their production of this valuable resource. Assam has started producing flooring board of bamboos, and for this, it has established a plant at the State Export Promotion Industrial Park at Amingaon. The plant produces 60,000 m^2 of board per annum. The plywood-producing factory, Kitply, has switched to the use of bamboo for the manufacture of plywood and is also making particle board with the support of NBDA. Several other industries, notably Maisang Bamboo Products at Sibsagar and Barak Bamboo and Cane Udyog, at Karimganj, are making use of bamboo for their varied products.

Tripura has an area of 2,400 km^2 under bamboo forests and supplies bamboo as a raw material to the paper mill at Panchgram in Hailakandi district. Tripura seems to excel all other states in the manufacture of utility furniture. One has only to visit the office of the State Tourism to convince oneself of the elegance and style of furniture that the state is capable of producing.

Nagaland has 7,800 ha under bamboo forests. The state supplies bamboo at a raw material to the Nagaland Pulp and Paper Plant located at Tuli in Mokokchung district. The state has developed a bamboo shoot-processing plant (Nagaland Foods Pvt. Ltd.) at Dimapur with the support of National Mission on Bamboo Application. The unit that went into production in 2005 also processes pineapple slices, passion fruit and orange juice.

In Arunachal Pradesh, a processing unit is established to process the bamboo shoots at Namsai. Besides, a plywood factory, that was closed, is reopened using a range of bamboo materials. The state also produces flattened bamboo and many other prefabricated building and cladding materials.

Meghalaya has 3,108 km^2 of bamboo forests that is roughly 14 % of the geographical area of the state, with bamboo stock estimated at 2.6 million tons. Though these forests are controlled and managed by District Autonomous Councils, a number of bamboo-based small industries have come up in the state. These include Meghalaya Bamboo Chips Ltd., Meghalaya Plywood Ltd., Timpack Rot Ltd. and M/s Roka Cane and Bamboo Works.

17.3.4.1 Prospects of Industries Based on Bamboo

Bamboos grow on the demise of forests. There are only a few and occasional natural bamboo brakes in a tropical forest. Once the forests are ravaged, as indeed they have

been, for making room for shifting cultivation, the vacant lands get colonised by bamboos. In Mizoram, bamboo has colonised large tracts of land that were once under evergreen forests. Bamboo as a raw material for a variety of industries, particularly pulp and paper, is proving economically rewarding and not shunned as a weed. Its expansion is usually at the expense of tropical forests, which are subjected to burning by successive cycles of shifting cultivation and are visibly shrinking. While bamboo forests feed the pulp and paper industry, a simultaneous loss of forests has created a situation that needs to be remedied.

17.3.5 Mineral-Based Industries

Cement is one of the essential products for construction and infrastructure development in an area. Residential buildings, highways, industrial complexes, sea and airports and all kind of public and private buildings require cement. In a region like the North-East of India, which is yet to develop to its potential, cement industry has a crucial role in its development. Yet, for long the region did not have a single cement industry, and cement had to be transported from other parts of India, involving huge transport cost (Fig. 17.2)

A cement factory has to depend on several raw materials like high-grade limestone, clay and coal, of which limestone is the principal one. Of necessity, the industry has to be located close to where adequate quantity of limestone is available to feed the factory.

17.3.5.1 Some Major Cement Factories of the North-East Region

Bokajan Cement Factory

A public sector undertaking, established and run by the Cement Corporation of India, it was commissioned in 1976. The factory at Bokajan, in Karbi-Anglong district on North-Eastern Railway, is about 15 km north of Dimapur on Dhansiri river. Besides being a railway station, it has the advantage of having high-grade limestone in the vicinity at Dillai Parbat, which feeds the factory. Dillai Parbat has a reserve of 30 million tons of limestone. In addition, Koilajan another area about 25 km west of Bokajan has a reserve of 30 million tons of limestone. Assam state, as a whole, has a potential reserve of 650 million tons of industry grade cement. The plant at Bokajam has a capacity to produce 180,000 metric tons of cement annually. There are also some small cement factories in North Cachar Hills in private sector. The most notable of these is M/s Vinay Cements Co. It uses the limestone occurring in Umrangshu (N. C. Hills) area.

A major cement factory, Calcom Cement India Ltd. in Nagaon district is recently established at Lanka, with an equity participation of the Government of Assam. The plant, utilising the limestone deposits at Umrangshu, is designed to produce five

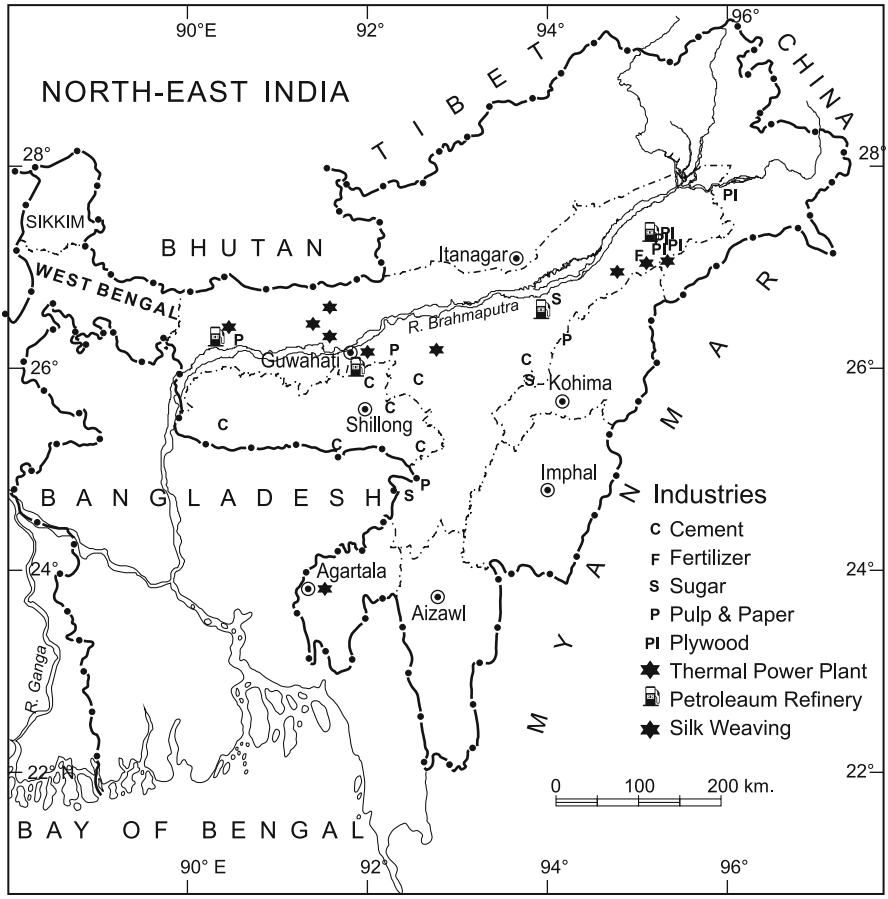

Fig. 17.2 Distribution of industries in North-east India

million tons of cement annually. This is important in view of the fact that the cement plant at Bokajan has very small capacity and is too inadequate in view of the rising demand for cement in the North-Eastern region.

17.3.5.2 Cement Industry in Meghalaya

Meghalaya has a number of cement plants, but the most important is the one at Cherrapunji, known as Mawmluh Cherra Cement. The plant has the capacity to produce 200,000 tons of cement annually. Besides Mawmluh, there are three other cement industries, viz. Meghalaya Cement Ltd., Cement Manufacturing Co. Ltd. and Meghalaya T. & E. (P) Ltd. All these units are located at Lumshnong in Jaintia Hills district. The four major cement plants in Meghalaya and their installed

Table 17.12 Cement-producing industrial units in Meghalaya

Name of cement factory	Location	Annual production capacity (million tons)
1. Mawmluh Cherra Cement	Cherrapunji, E. Khasi Hills	0.20
2. Meghalaya Cement Ltd.	Lumshnong, Jaintia Hills	0.30
3. Cement Manufacturing Co.	Lumshnong, Jaintia Hills	0.59
4. Meghalaya T. & E. (P) Ltd.	Lumshnong, Jaintia Hills	0.46
Total		**1.55**

capacity are as follows (Table 17.12). The production capacities of these units are likely to increase.

Besides these major cement factories, there are smaller cement-producing units. These are listed below.

1. Virgo Cement, Damas, East Garo Hills
2. Jaintia Cement, Pvt., Jaintia Hills district
3. AMS Cement Pvt. Ltd., Lawpdang, East Khasi Hills
4. Banber Cement Pvt. Ltd., Barapani, Ri-Bhoi district
5. RBK Cement Pvt. Ltd., Barapani, Ri-Bhoi district

These are small cement units, which cater to the local demand and take advantage of the locally available limestone. The two favoured locations for cement industry seem to be the southern edge of Meghalaya plateau, close to limestone deposits, or near similar deposits in Jaintia Hills district, where Lumshnong is the favoured site. Other small cement units are located either at Barapani or at Barnihat. Many of these small units produce lime, which they term calcinates and are located at one or the other of the two industrial areas, viz. Barapani and Barnihat. It has to be noted that there are 160 small cement or cement-based small industrial units in Meghalaya, producing pipes, cement blocks and slabs, calcinates, etc.

Arunachal Pradesh produces a limited quantity of cement through its small units like Parasuram Cement in Lohit district and a small plant at Basar in West Siang district.

17.3.5.3 Cement Industry Versus Environment

There is no better example of a conflict between the need to produce more cement, as the development of much of the infrastructure depends on it, and the resistance that is encountered from the advocates of environmental preservation. The latest case was that of M/s. Cosmos Cement Ltd. who planned to set up a cement factory at Salang, Sutnga Elaka, Jaintia Hills, with a capacity of 4,500 tons of cement per day. The move was opposed by Hynniewtrep National Youth Front (HNYF) and a number of other NGOs. Similar was the situation with the Hill Cement Co. planning to set up a cement-producing plant at Mynke, a village in Jaintia Hills district.

It must be admitted that there would be some degree of air pollution and damage to local ecology despite the adoption of best technology and suitable industrial practices, yet the fact cannot be overlooked that the region needs to harness the available resources for an overall development. Such conflicts are universal, and the remedy would be to reconcile the conflicting situations by a balanced approach. To give up the process of industrialisation and perpetually depend on external resources would, in no way, be helpful to the region.

With its capacity to produce 170 million tons of cement in a year, India is the second largest producer of this commodity in the world, after China. With growing accent on infrastructure, the country has to increase its cement-producing capacity. The plants, of necessity, have to be located in the vicinity of limestone deposits. Meghalaya, with an estimated reserve of 5,000 million tons of limestone and 460 million tons of coal reserves (of which 118 million tons are the proven reserve), offers prospects for the development of cement industry.

It may be noted that the neighbouring country, Bangladesh, is only too willing to pay a handsome price for the limestone of Meghalaya. The Lafarge Umiam Mining Pvt. Ltd. has been extracting limestone from the southern border of Meghalaya and transporting it to Bangladesh over a 17 km long conveyor belt. Even though the factory in this case is not in Meghalaya, the environmentalists opposed the extraction of limestone. The matter could be settled only with the intervention of the Supreme Court of India, through a judgement that accepted the views of Lafarge and they were permitted to mine the limestone.

These conflicts raise a general question of how far the state is prepared to effect a trade-off between industrial development and preservation of environment and biodiversity.

17.3.6 Other Industries

17.3.6.1 Fertiliser Industry

The North-East region like any other part of India, with not much land left for reclamation, depends for increasing agricultural productivity, on modernising farming practices and better inputs like irrigation and fertilisers. In the entire North-Eastern region, there is only one major fertiliser-producing plant at Namrup, in Dibrugarh district.

The Namrup Fertiliser Factory

The factory, owned by the Fertiliser Corporation of India, utilises the natural gas available in the region, particularly from Nahorkatiya oil and gas field, and produces roughly 225,000 tons of fertiliser every year, which consists of ammonium sulphate, urea and nitrogen. The fertiliser plant is a model of effective utilisation and

recycling of the production. The natural gas, produced at Nahorkatiya, is used as a fuel for generating power and as a raw material for petrochemical industry and the fertiliser plant. The fertiliser produced at Namrup fulfils the fertiliser requirement of the region and is even exported to Bengal.

17.3.6.2 Petrochemicals and Other Chemical Industries

Assam is the only state in the region that has petrochemical industries. Most of these are based on petroleum and its by-products.

Assam Petro-Chemical Ltd.

Assam Petro-Chemical Ltd. located at Namrup uses the natural gas from the oil and gas fields of Nahorkatiya and produces methanol, formalin and other associated chemicals. Developed in technical cooperation with a Japanese company, it produces around 700 metric tons of methanol and 12,000 tons of formalin. It also produces adhesives for the plywood factories operating in the area.

17.3.6.3 Sugar Mills

For crushing the cane, there are three sugar mills in the region, one at Anigaon in Karimganj district of Assam and another at Dergaon (Assam Cooperative Sugar Mill) about 25 km west of Jorhat in Golaghat district and a third at Dimapur in Nagaland. The factories at Dergaon and Anigaon (Karimganj) employ around 600 persons each. The important aspect of the factory at Anigaon is its utilisation of surplus land, owned by tea estates, for growing sugarcane.

17.3.6.4 Jute Industry

The production of jute has progressively gone down. The surplus jute was formerly exported, but now the region has two jute mills, one at Silghat in Nagaon district and the other in Tripura near Agartala.

17.3.6.5 Fruit- and Spice-Producing Units

All the states in the North-East possess one or several kinds of processing units, which process food, fruits and spices. This kind of enterprise is necessary as it saves horticultural products from wastage and distress sale by farmers. Besides, processing adds value to the product and makes horticulture a more viable proposition.

The pineapple and orange harvests of the region often suffer damage in the absence of a market, and long distance transport adds to the cost, thereby deflating demand.

Arunachal Pradesh has a couple of horticulture processing units of which one at Naharlagun near Itanagar and the other at Nignoi, close to Along in West Siang district, are known. In Assam, most of the fruit-processing units are located at Guwahati. Manipur has some small fruit preservation and fruit-processing units including the one run by Horticulture Department of Manipur. It also has a processing unit to process the ginger grown in the state. In Meghalaya, fruit-processing units are run by the State Government, of which one at Shillong and the other at Dainaduhi, in Garo Hills, are well known. In Mizoram, a food-processing unit is located at Sairang, close to Aizawl. In Nagaland, fruits and vegetable units are located at Dimapur to take advantage of the market and the rail–road transport facility. The town has a few processing units.

17.3.6.6 Small Industrial Units of Mizoram and Tripura

Mizoram has no medium- or large-scale industries. A large number of industries are 'on-account enterprises', run by family members without employing hired labour. According to Fourth Economic Census of Mizoram, the state has in all 24,943 enterprises employing around 75,000 people. The state has set up a silk reeling factory at Zemabawk and two smaller units at Kolasib and Zobawk. But the most important industrial centre that is being developed in the state is at Zuangtui close to Aizawl. Besides the development of two additional industrial estates at Kolasib and Chawngte, there is a proposal to establish an industrial growth centre at Luangmual in Aizawl district and an Export Promotion Industrial Park (EPIP) at Lengte village near Lengpui airport. Despite these proposals, no clear industrial area or cluster has emerged so far.

In Tripura, there are 35,500 enterprises of all kinds with variable employment, starting with family units to organise manufacturing industry. Out of 35,500 industrial production units, 31,300, i.e. 88 %, are on-account family manufacturing units. The number of those listed in the directory of manufacturing is less than 1 %. Most of the industries are around Agartala, but too small to make an industrial cluster of significant impact.

17.4 Important Industrial Clusters

Some of the very obvious concentrations of industry that make clusters are in Assam and Meghalaya. One can identify three or four industrial clusters in Assam (Fig. 17.3).

1. Tinsukia–Dibrugarh–Sibsagar industrial zone
2. Guwahati–Barnihat industrial zone
3. Bongaigaon industrial zone

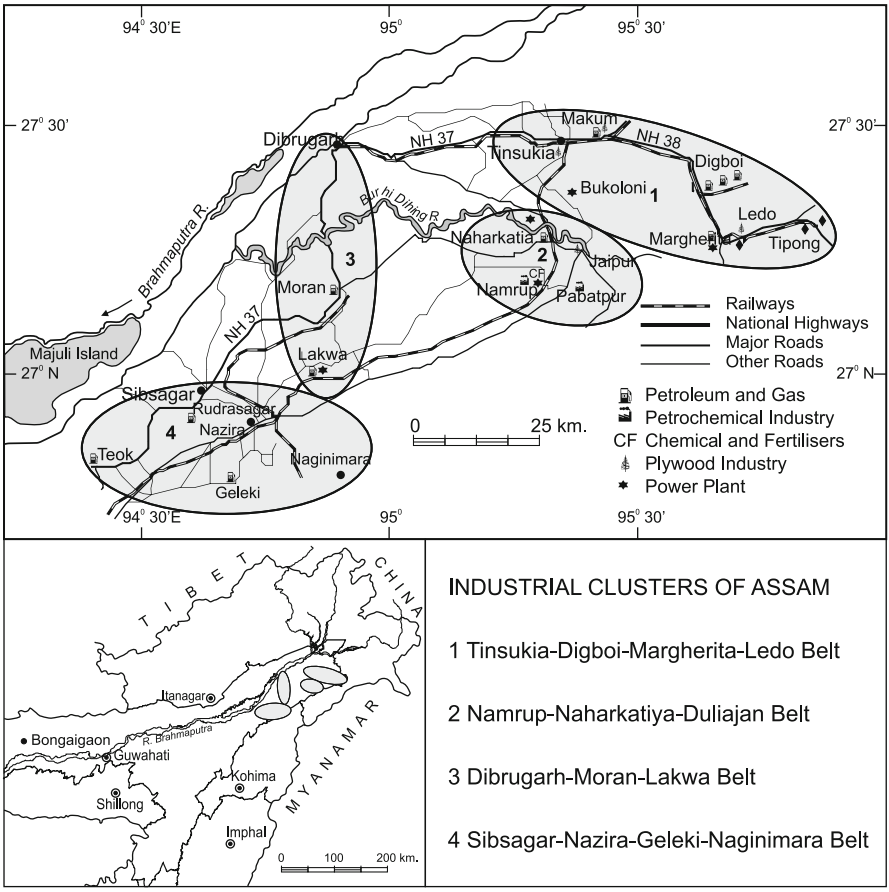

Fig. 17.3 Location of industrial clusters in Assam

The Tinsukia–Dibrugarh–Sibsagar zone has a number of smaller industrial belts and clusters of industries developed around several centres. One can identify four industrial belts in this zone, viz.:

1a. Tinsukia–Digboi–Margherita–Ledo industrial belt
1b. Namrup–Nahorkatiya–Duliajan industrial belt
1c. Dibrugarh–Moran–Lakwa industrial belt
1d. Sibsagar–Nazira–Geleki–Naginimara industrial belt

17.4.1 Growth of North-Eastern Industrial Zone

The North-Eastern extremity of Assam consisting of Tinsukia, Dibrugarh and Sibsagar districts, all confined to the south of river Brahmaputra, had an early

momentum in their politico-economic growth. Firstly, Sibsagar was the seat of Ahom kings for several centuries who oversaw the growing prosperity of the region. The arrival of the British accelerated this process. Beginning with the discovery of indigenous tea plant (*Camellia sinensis var. assamica*) and the rapid growth and emergence of many tea plantations, mostly owned by British companies and run by British planters, had a noticeable influence on British administration. The latter protected and promoted the interest of the tea planters and, in the process, ensured a smooth law and order situation, better transport and the establishment of some technical and medical facilities. To facilitate export of tea, before the arrival of railways, Dibrugarh was developed into a dependable river port. With the arrival of railways in the last quarter of the nineteenth century, a large railway workshop, one of the largest in eastern India, was established at Dibrugarh.

The industrial development that took off with the discovery of tea and growth of tea plantation, exploitation of petroleum and coal and the arrival of the railways, in the region, is accentuated during the last six decades with the discovery of more oilfields, modernisation of railways and improved connectivity with the rest of the country. With a railroad bridge built across Brahmaputra at Saraighat (Guwahati) and the coming up of a number of power plants and industrial units, like petrochemicals and fertiliser, the region has come to enjoy a primacy in industrial development, over all other parts of Assam.

The North-Eastern region of Assam, comprising the districts of Tinsukia, Dibrugarh and Sibsagar, is by far the most industrialised zone of the region, a counterweight to Guwahati capital region, about 500 km to the west. Located in the core area of oil and coal production, the zone has an above average level of urbanisation of about 20 %. With 95 % of the tea gardens lying in Dibrugarh and Sibsagar districts, accounting for two thirds of the total tea production in the state, the region is fast becoming the industrial showpiece of North-East India.

17.4.1.1 Tinsukia–Makum–Digboi–Margherita–Ledo Industrial Belt

This industrial belt runs along the northern extremity of the North-Eastern Railway. Tinsukia, lying at the north-western extremity of the belt, is the fulcrum point that directs and controls much of the export and the trading transactions of the belt. Digboi, the oil town with a century-old refinery, lying midway between Tinsukia and the coalfields of Margherita, Ledo and Likhapani on Tirap border, is another important town with a variety of industrial activities. All these places are strung along the railway line that runs from Tinsukia via Digboi to the coalfields of Margherita and Ledo. The area has still some thick forests away from the railway route. Lying in the valley of meandering Burhi Dihing river, the area has an assured water supply. Tinsukia is the major town that serves as a distribution and wholesale trading centre for food and other goods imported from other parts of the country. The town serves as a collection and trading centre for tea.

17.4.1.2 Namrup–Nahorkatiya–Duliajan Industrial Belt

Unlike the Tinsukia–Digboi–Ledo belt, this industrial belt has emerged recently following the discovery of oil and gas at Nahorkatiya. Though oriented to Tinsukia, this belt depends largely on the development at Nahorkatiya gas field, about 30 km south of Dibrugarh on the North-East Railway line. Duliajan, a place north of Nahorkatiya, has become the main industrial complex of the belt with its power generation units based on coal and gas, a fertiliser and a petrochemical plant. Namrup, at the northern end of the belt, under the shadow of Patkai range, is the third largest town of Dibrugarh district and complements Nahorkatiya and Duliajan in converting the oil and gas into industrial products.

17.4.1.3 Dibrugarh–Moran–Lakwa Belt

Oriented to Dibrugarh, the two towns, Moran and Lakwa, have important oilfields, and Moran has even some gas resources. Moran has a crude-conditioning plant like the one at Duliajan and supplies oil to Guwahati refinery. Taking advantage of the gas, a thermal power station called Lakwa Thermal Power Station (LTPS) based on gas is developed at Lakwa, located on the main North-Eastern Railway, about 25 km from Dibrugarh. This is the belt lying between Dibrugarh and Sibsagar. This is also an important tea-growing area. With Dibrugarh on Brahmaputra as a focal point, having an airport, a large railway workshop, one of the oldest in the country, and a university with an engineering college, the belt extends up to Sibsagar. Densely peopled, the belt is poised to develop further, and more industries are likely to spring up in this belt, in the coming years.

17.4.1.4 Sibsagar–Nazira–Geleki–Naginimara Belt

Sibsagar, located on Dikhu river in a flood-free zone, at a safe distance from Brahmaputra, has been for long the capital of the Ahoms who had initially made ‘Ghargaon’, modern Nazira, their residence. The coalfield that starts in the vicinity of Nazira runs for over 25 km extending as far to the south as Naginimara, a border settlement of Nagaland in Mon district. This is an old coalfield, which extended inland in Nagaland as far as Barjan and Kengaon where coal was exploited in the early part of last century and hauled over several kilometres on a track specially laid for coal transport. The coalfield at Nazira and oilfield at Geleki have led to the location of a 285 MW thermal power station at Amguri, a railway station on the river Jhanzi, about 20 km south of Sibsagar. The recent oil find at Rudrasagar in the vicinity of Sibsagar, and at Teok, about 25 km to the south on Sibsagar–Jorhat road, has given a boost to further industrialisation of this belt. Even Tuli, a border town in Mokokchung district of Nagaland, with its pulp and paper plant, can be included in this industrial belt because of its proximity to these centres and a road link connecting it with the industrial centres of Brahmaputra plain.

17.4.1.5 Guwahati–Barnihat Industrial Cluster

These two centres are 20 km apart, Guwahati, a million city, a gateway to the North-East, with a well-developed industrial base and Barnihat, a non-urban settlement, on Guwahati–Shillong road (National Highway No. 40) that connects south Assam including Cachar, Hailakandi and Karimganj, and even Mizoram and Tripura with Brahmaputra valley. Barnihat is, by far, the most important centre of Meghalaya. Out of 36 large and medium industries of Meghalaya, 24 are located in Ri-Bhoi district, and of these 24, 18 are in Barnihat. Ri-Bhoi is the most industrialised district of Meghalaya just south of Shillong, occupying the northern slopes of Meghalaya; the district offers unique advantage of nearness to the main transport lines, railways and roads that run parallel to Brahmaputra from the north-east extremity of Assam, starting from Tinsukia to any part of India.

Barnihat combines the advantage of incentive offered by Meghalaya State Government because of its location and access to easy transport, raw material, market and other techno-financial advantage because of its proximity to Guwahati.

Guwahati, on the other hand, is the gateway to the North-East and a focal point for the entire region. Overland access to any state of the region is through Guwahati, and thus it commands a very unique position in the economic development of the region. Being an air-hub, most of the air services take off from here on their onward flight to different states. It is a transit point for passengers and goods originating in other parts of India and a break of bulk point where goods are transported from railway to road transport or vice versa. As an industrial city, besides being the capital of the state of Assam and the largest city of the North-East, Guwahati has some major industrial units, the most important of which is the Guwahati refinery, located at Noonmati, a suburb of Guwahati. Other industrial units based on petrochemicals came into existence, of which carbon blocks and calcinated petroleum coke are most noticeable. The town has a mixed fertiliser production unit, Fertichem Ltd. at Narangi, another suburb of Guwahati. Not far from Guwahati is Chandrapur where a silk spinning mill is run by National Textile Corporation of India. There are several smaller textile, petrochemicals, metals and rudimentary manufacturing units of all kinds that give Guwahati the state of a capital city with a good industrial base.

In Barnihat on the southern edge of Guwahati, the factories largely produce building material like cement-based pipes, lime, stone and crushed stone and slabs, bricks and cement blocks and steel-based fabricated material used in buildings. There are a few beverage-producing units. Yet, one may call Barnihat the home of offensive and dirty industries.

To the industry owners, Barnihat offers the advantage of a well-connected place with attendant incentives and markets and to Meghalaya; the industries in Barnihat offer a pretence of the state being industrialised without inviting the pollution to Shillong that occupies the pride of a place in the life and economy of the state.

An agglomeration of industries in Guwahati, an oil refinery at Noonmati, a thermal power station at Chandrapur Bagicha coupled with large spinning mill run by Textile Corporation of India and chemical industry run by the State Government besides a number of metal industries form the core of the Guwahati industrial

cluster. To this may be added the fertiliser plant in Narengi, a suburb of Guwahati, a paper mill at Jagiroad in Marigaon but not too far from Guwahati and Rangia in the trans-Brahmaputra region, and Barnihat as mentioned earlier. It may be noted that unlike other industrial units of North-East Assam, there is no complementarity between Guwahati and Barnihat; the latter has a total dependence on Guwahati.

17.4.1.6 Bongaigaon Industrial Complex

About 60 km inside the western border of Assam and 30 km north of Brahmaputra, Bongaigaon is located on a western tributary of river Manas. It houses one of the three thermal mega power projects of the North-East and has a petroleum refinery, a petrochemical unit producing variety of chemicals including industrial gases. While the thermal power plant is not exactly at Bongaigaon and is located at Nandangiri Hills, a few kilometres away, the city boasts of a railway workshop similar to the one at Dibrugarh, specialising in repairing and maintenance of coaches. This has given rise to New Bongaigaon Railway Colony, treated as census town. Similarly, Bongaigaon Refinery and Petrochemicals Ltd has emerged as a township.

Not dependent on other industrial units except for crude oil that is fed to the refinery from the oilfields of North-East Assam, particularly Nahorkatiya, Bongaigaon is an independent industrial complex. It receives coal for its thermal plant from West Bengal and Jharkhand and supplies gasoline and other petroleum products to different parts of the country.

Occurrence and utilisation of fuel resources and raw material, particularly petroleum and coal accessibility, an ease of distribution, need for local or regional processing and complementarity of raw materials like crude, power-generating plants that depend on crude and utilisation of by-products like gas to generate power of fertilisers, have produced horizontally linked industrial complexes like Duliajan–Naharkatiya–Kamrup, Moranhat–Lakwa and Nazira–Amguri. In some cases, it is the proximity to large centre that has produced a satellite industrial centre as Guwahati–Barnihat. Then there are centres like Bongaigaon, where the industries are state owned. A policy of inducing regional development adopted by Central as well as the State Government has promoted the growth of an industrial complex at Bongaigaon, a location convenient to get supply of coal from neighbouring West Bengal for its thermal power station and having closer access to the markets of the country for its petrochemical products.

17.4.2 Public and Private Initiative in Industrial Development of the North-East

Almost all the early industrial units of the region as well as other service and trading enterprises were promoted and owned by private companies. Tea cultivation and processing was, as it is today, in private hands. The contribution of George Williamson

Company to the growth and propagation of tea is unparalleled. The steamer service on Brahmaputra was run by private company. Most of these companies were owned by British interests and hardly considered regional development as an objective of industrialisation. In the field of petroleum, the mining as well as refining and trading interest were owned by Assam Oil Company, taken over subsequently by Burma Oil Company and Burma Shell. These companies exploited the regional products like tea and cotton, mined oil and petroleum, undertook refining and marketing them in India or abroad earning a handsome profit. Regional development and employment to the people was far from the mind of the promoters. Maximising of profits by enhancing efficiency of the plant, under the benign protection of the British Government, was the sole objective of the industries.

During the last six decades, development and organisation of industries of the region has changed radically.

Firstly, the industrial development of the region is being promoted largely by public enterprises guided by the industrial policies of the Central and State Governments. The region has not attracted much private capital, and much of the development that is seen is based on the industries established by governments. Coal and oil interests of the region are controlled by Coal India and Oil India, Indian Oil Corporation or Oil and Natural Gas Commission. The four refineries at Digboi, Guwahati, Bongaigaon and Numaligarh are in public sector. The railway and road services are in public sector. Tea, a risk-free business, still remains in private hands, but the region has not been able to attract substantial capital; the gap in investment is being filled up by public enterprises.

Power generation and distribution, as in most other states, are completely owned and controlled by Central and State Government. Power generation both thermal and hydroelectric has been promoted by central agencies. The National Thermal Power Corporation (NTPC), National Hydroelectric Power Corporation (NHPC) and North East Electric Power Corporation (NEEPCO) undertake surveys, develop proposals, get necessary clearance and finally execute the projects.

Besides power, other industries also require government initiative and support, and in response to government policy, a large number of central and a few state enterprises have been established. The Hindustan Paper Corporation, the Cement Corporation of India, the Textile Corporation of India and the Fertiliser Corporation – all have not only a symbolic presence in the region but have established large industrial units, not to mention the Hindustan Construction Company that built the first bridge over Brahmaputra, the Saraighat road rail bridge in 1963.

Why the region has not attracted capital is not a puzzle; the reasons in the case of the North-East are the same as in the case of some of the laggard states in the country like Bihar and Uttar Pradesh. An inadequate infrastructure, law and order problems, disturbed conditions, inadequate market and locations devoid of financial and technical advantage together work as disincentive to attract industries. With the current economic policy of liberalisation of the Central Government doing away with many restrictions to encourage growth, North-East may attract more industries in the years to come.

17.4.3 Prospects of Industrial Growth and Constraints

North-Eastern region of India has certain key resources and locational advantages that have not been tapped to their potential.

Firstly, the region has enormous water resources. About 18 % of the total rainfall of the country is received by this region, much of which remains unutilised. But more importantly, the relief conditions are such to ensure a huge hydroelectric power potential. Some believe that about 40 % of the total hydroelectric potential of the country lies untapped in this region. Petroleum is another resource, with four oil refineries uniformly spaced in the Brahmaputra valley, and refining locally produced crude, the region does not have to incur huge transport cost for getting its requirement of petroleum and its products. Tea is another product that besides adding to the region's income contributes to the country's foreign exchange earnings. With its natural beauty, forests and large variety of flora and fauna, the region is like a museum of nature. This can be seen in a large number of national parks and wildlife sanctuaries. The natural beauty of the region with its varied landscape is an asset that is being utilised to promote tourism. Despite all these positive aspects, the growth rate and the per capita income of the region have remained comparatively low.

Obviously, there are constraints, which are not insurmountable, but which need to be removed.

The locational disadvantage, being in a peripheral zone of the country, far removed from the centre, and relatively poor accessibility is one reason that cannot be changed, but it can be transformed into an advantageous factor, once the relations with the neighbouring countries, China, Burma, Bangladesh, Bhutan, turn into a mutual trust and respect, promoting border trade and easy movement between the countries and the region. Today the situation is different. In place of the growing free trade of goods, services and people, benefiting each other, what exist are mutual distrust, illegal migration and trade, non-cooperation and lack of inclination to facilitate the economic development of the neighbour. There exists a friendly treaty with Myanmar, and the international border between the two countries is settled and demarcated under a treaty of 1960. Bhutan is a friendly neighbour, but relations with China and Bangladesh have yet to attain even keel, and scepticism of each other's intention trouble the relationship that could ensure lasting peace and prosperity. The recent opening of the Nathu La pass of Sikkim between India and China and the possibility of having access to the sea through Burmese port Sittwe, situated on the mouth of Kaldan river, augur well. The opening of land route to Burma either through Imphal, the capital of Manipur, or Moreh, a border town in Burmese territory, or repairing the old Stilwell road that passes through Tirap in Arunachal Pradesh, which was a supply road during the Second World War, could be a good start in what the Indian Government defines as its 'Look East Policy'.

Many believe that disturbed conditions in the North-East and the existence of many insurgent groups, which pretend to wage struggle against the State and Central Governments to secure better future for the people of the region, including

a better ruling regime are the principal reason for the absence of any worthwhile industrialisation. Howsoever justified the grievances of these groups may be, an armed struggle often resulting in the loss of innocent lives and valuable property exacerbates the situation. Voicing concern, grievances or even struggle through democratic means may secure better results to benefit the region.

North-East has a very salubrious climate, in some ways resembling that of temperate latitudes. If properly developed the hilly region could be transformed not only into a hotspot of international tourism, but also into a veritable fruit basket of India.

References

Basic Statistics of North-Eastern Region (2006) North-East Region Secretariat, Govt. of India, Shillong, p 322

Das Gupta AB, Biswas AK (2000) Geology of Assam. GSI, Bangalore

Govt. of Meghalaya (2003) Meghalaya socio-economic reach. Directorate of Economics & Statistics, Meghalaya, p 47

Chapter 18
Transport and Trade in North-East India

Abstract Early in history, Brahmaputra and Barak, the two principal rivers of North-East India, served as the main arteries of transport. Boats, for a long time, were the principal mode of travel and transport. During the medieval period, several east–west land routes, known in Assamese as *Alis* in Brahmaputra plain, both to the north and south were opened. The 560 km long northern route, known as *Gohain Kamal Ali*, was built by the Koch kings in the mid-sixteenth century. Similarly, many routes were laid by the Ahom kings, principally in south Brahmaputra plain. However, there was hardly any wheeled transport in the region till late nineteenth or early twentieth century. The arrival of the British changed things. They connected Assam with the Bay of Bengal by a metre gauge railway between Digboi in the North-Eastern corner of Assam and Chittagong, a port in Bengal. The hilly terrain of the region has always been a problem in laying down an efficient network of transport. With the building of several bridges over Brahmaputra in Assam and the conversion of the existing metre gauge routes into broad gauge, Assam has been linked with all parts of India. A noteworthy fact is that the region has a relatively dense network of airports and air services. With the international airport at Guwahati and the proposed Trans-Asia road network, North-East India may be very effectively linked with Southeast Asia, to its economic advantage.

The traditional trade of the region is replaced with the export of tea, petroleum and petroleum products, silk and silk products and a variety of products of cottage industries. North-East India imports a lot many things from other parts of India, especially machinery, road transport equipment, textile products, pharmaceuticals and food products.

In the evolution of human civilisation, transport has always played a significant role. Interactive space of humanity progressively expanded in history as its mobility increased with the development of speedier and safer mode of transport. Originally confined to pack animals and sledges on land and dugout canoes and boats and later

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sailing vessels on sea, the system of transport was revolutionised with the discovery of wheels in the second millennium BC. This brought in a novel architecture of vehicles, all resting on a wheel carriage. The bullock carts and horse-drawn carriages, the railways, the automobiles and similar other modes of transport have, regardless of the energy source employed for traction, benefited from that marvel of scientific discovery called wheels. Over the generations, the sources of energy that drive the vehicles have undergone changes, from wood to coal, petroleum, gasoline and nuclear power; but in every situation the wheels, as the device to minimise friction and roll smoothly over thousands of kilometres, have remained indispensable. From the lowly bullock carts to the railways and automobiles, all use wheels for travel on land. Even the most modern jets run on wheels before taking off and landing. Making effective use of wheeled transport – bi- and tricycles, four-wheeled wagons, cars and trucks or railway wagons and coaches – requires a network of routes, such as roads or railways. The efficiency of the transport means rests not only on the design of the vehicles and the fuel used but also on the well-designed and smoothly flowing network of road and railway network.

18.1 Transport in the North-East Region

Though many of the above-mentioned modes of transport have faded in history and are resorted to only in a very specific terrain and situation, the North-East region has not only seen them all but also maintains some of these slow-moving outmoded modes of transport in specific situation of difficult terrain, or areas without a network of roads or railways, or in some catastrophic situations like floods, landslides and earthquakes when the established systems of transport, like railways and roads, are disrupted or washed away. The following pages trace the evolution of transport system in the North-East, the development during the pre-British period, the addition and expansion during the colonial rule and the spread of the network during the last six decades. What is clear is that during the colonial period, whatever piecemeal transport network was promoted, it was guided by the strategic interest of the rulers and the business consideration of tea planters and petroleum companies, promoting an overall system of exploitation, by collecting raw materials, derived from varied primary activities, and supplying processed goods. But, as will be seen later, the most important interest of the government was to facilitate growth and working of tea plantations, collection and export of tea and exploitation of coal and oil.

Before the development and the present status of the transport system in the region are discussed, the length of road and railway network in the region can be glanced through in the Table 18.1.

The hilly states of the North-East, which include Nagaland, Manipur, Mizoram and Meghalaya, have a relatively poor and inadequate network of road transport. Besides the quantitative inadequacy, most roads of all the states, with the exception of Sikkim, remain unsurfaced. This is a catastrophic situation for Assam and Tripura, which experience floods frequently, destroying these mud roads and requiring repair

Table 18.1 Length of road network in the North-East region (March 2002)

State	Total road length (km)	Road length per 100 km^2 of area	Percentage of surfaced road to total road length of the state
Arunachal Pradesh	18,365	21.93	30.98
Assam	89,486	114.09	14.40
Manipur	11,434	51.21	33.79
Meghalaya	9,565	42.65	68.58
Mizoram	5,075	24.07	56.58
Nagaland	21,021	126.79	30.69
Tripura	16,296	155.21	26.96
Sikkim	2,019	28.45	76.57
Total	*173,261*	*65.83*	*25.55*
All India	*2,456,647*	*74.73*	*57.82*

Source: Basic Road Statistics of India, 2001–2002, Ministry of Shipping, Road Transport and Highways, Government of India, New Delhi, quoted from Basic Statistics of NER, 2006, NE Council, Shillong

in the post-monsoon season. Assam, Meghalaya and Tripura have a reasonable length of roads, but large sections of these remain yet unsurfaced. Other states still have to develop an efficient network.

18.1.1 System of Transport in Historic Times

Being one of the regions of the country experiencing very heavy rainfall, North-East suffers frequently from floods in Brahmaputra and Barak rivers and occasional severe seismic disturbances. The two principal rivers of the region, Brahmaputra and Barak, served in early historic times as the principal arteries of transport as they did till the beginning of the twentieth century. Boats, for a long period, were the principal mode of travel and transport, during a major part of the year, in Brahmaputra valley. There are evidences to suggest that river traffic was regulated by the rulers: and one of the most widely quoted evidence is the Tezpur rock inscription of Harjara or Harjaravarman (829–830 A.D.), a royal charter regulating the plying of boats in the Brahmaputra within certain boundaries.[1] The Ahom kings had a well-organised navy, as is clear from the battle of Silghat (1662 A.D.) fought against Mir Jumla, the general of the Moghul emperor Aurangzeb, in which no less than 1,000 ships were taken, many of which could accommodate three or four score sailors (Allen 1905a).[2]

The management of transport system rested with different officers, each meant to supervise and maintain a specific mode of transport. The elephants, the horses, the palanquins and the boats, each were managed by a distinct authority. The elephants were kept in readiness by *Hati Barua*, the horses by *Ghoda Barua*, the palanquins

[1] Gazetteer of India (1999).

[2] Allen (1905b).

by *Dulia Barua* and the boats by one known as *Nao-Baisa Phukan* or *Pani-Phukan*. Boat building was a developed industry, and the boat yards, not unlike today's shipyards, were known as *Nao-Sali* administered by *Nao Salia Phukan*.

It appears that wheeled transport was either altogether absent or unknown, or not so important. With Brahmaputra, traversing the entire length of Assam plain and presenting a large waterfront, water transport remained the principal stay for heavy goods traffic and every long distance group travel. Boats carrying merchandise, known as *Dingas*, with conveniently located ports of call, used to ply all along the length of Brahmaputra. In difficult terrain and for smaller distances, pack animals were used. For personal travel, elephants, horses, palanquins and even country boats were employed. Palanquins, carried by hired carriers, were the mode of transport of the nobility and the royals. While the water transport was used extensively, pack animals and coolies were used for goods transport on land, besides the bullock carts, which were used in Brahmaputra valley occasionally, with solid disc-like wheels.

Unlike the plains, long distance transport was not so common in the hilly areas, and 'head loads' was the common mode of transport. The hill people travelled on foot and carried goods on heads or on a pannier, with a pair of baskets suspended from the extremities of a pole and carried on the shoulder.

Whatever transport routes are seen today in the hilly states of the region are not more than a 150 years old and were introduced in the latter part of the nineteenth century by the British administration. In contrast, the transport routes, particularly the roads in Assam including Cachar, are fairly old, and large number of them were either built or initiated during the medieval period by different rulers, more specifically by the Koches and the Ahoms.

18.1.2 Transport Routes During the Medieval Period

The least recognised routes, though very significant, were the frequently trodden village paths and cattle tracks, connecting each village with the surrounding area or the neighbouring villages, but regular long distance roads were built only with royal patronage. Known as *alis* these were used for the benefit of the general public but also for long march of the armies. These roads, often parallel to a river following a specific contour above the flood line, were like embankments, offering protection against floods and prevented floodwaters from submerging large areas.

Gohain Kamal Ali, the grand northern route – One of the early well-known trunk roads in Assam was built during the Koch king Narnarayan's rule (1534–1584), under the supervision of his younger brother Gohain Kamala. The road running between Koch Bihar, the capital of the Koch kings, and Narayanpur, in the present Lakhimpur district, a distance of 560 km, is named after the prince as 'Gohain Kamal Ali'. Completed in 1547, this was both a road and an embankment, running almost parallel to Brahmaputra on its northern bank and ran almost the entire length of Assam from west to east. The road was meant to facilitate the Koch campaign against the Ahom kings based in 'Ghargaon', the present-day Nazira,

a town 25 km east of Sibsagar. The road is known even today as Gohain Kamal road. This northern trunk road of the sixteenth century was connected to Guwahati by a bund road, known as Bongal Ali, originating from Darrang and terminating at a station opposite Guwahati.

18.1.2.1 Roads Built by the Ahom Kings

Most of the roads built by the Ahom kings were confined to eastern Assam, centred around Sibsagar, the capital of the Ahom kings.

Dhodar Ali

The most well-known road built during the Ahom period in the last quarter of the seventeenth century was the one called Dhodar Ali, passing through Sibsagar and Dibrugarh and terminating at Jaipur about 25–30 km south of Tinsukia. Over 200 roads, long and short distance, were built by the kings and the nobles of Ahom period, albeit several of these roads traversed a few kilometres. Some of the better known roads include[3]:

1. Cheoni Ali – between Golaghat and Jhanji
2. Machkhowa Garh – from Jhanji to Gaurisagar
3. Bar Ali – from Gaurisagar to Joysagar
4. Na Ali – from Joysagar to Sibsagar
5. Barborua Ali – from Sibsagar to Dibrugarh

These were the roads built in bits and pieces to connect Golaghat to Sibsagar. Even in Golaghat district roads like Aka Ali, Daksinghengara Ali and Merangi Ali were built for short distances. Most of these roads radiated from Sibsagar or were built in the area surrounding Sibsagar, the royal seats of the Ahoms.

18.1.2.2 Riverside Embankments Used as Transport Routes

Besides these roads known as *alis*, the Ahoms and their successors also built many embankments, known as *garhs*. These embankments served the dual purpose of protecting the countryside from the fury of the Brahmaputra during floods as well as serving as well-defined routes. These were wide enough to be used as roads. Many of the *garhs* (or embankments) are converted into public roads, and some of them have undergone total decay over the centuries. Some of these embankments exist even today with a changed identity like ‘Gar Ali’ of Jorhat town that was once

[3] To enumerate, there were many such roads that were recorded, like Naga Ali, Kharikhola Ali, Dhai Ali, Duborani Ali, Maduri Ali, Chalai Ali, Nitai Ali, Barphukaner Ali, Senchao Ali, Keria Ali, Sripuria Ali and many more. Rahman (1967).

an embankment called Bibudhigarh to protect Jorhat town from Brahmaputra floods. The most striking embankment of the Ahom times is Numaligarh, a town known for its oil refinery, hemmed in between Brahmaputra, hardly 15 km away, and the river Dhansiri. Similarly, in the vicinity of Golaghat, Kamarband Ali is an embankment-cum-road, built during the early Ahom period.

In fact, the system of embankments existed in Assam even before the arrival of Ahoms. The latter after their arrival accelerated the process with well-organised free labour under *paik* system, discussed earlier. An ensured supply of free labour enabled the Ahoms to take up building of embankments on a large scale. Such embankments can be observed not only on both sides of Brahmaputra but even along flood-prone tributaries like Subansiri and Ranga in the North and Burhi Dihing, Disang and Dikhu river in the south, close to their confluence with Brahmaputra. Even in their middle courses, some of these rivers like Dhansiri are embanked to offer protection to their flood plains or to neighbouring parallel routes like railways and roads. River embankments, thus, offered convenient dual-purpose routes.

Water transport was the chief means of travel in the plain of Cachar. The region used to be, as it is largely today, partially submerged during monsoons and land travel was rendered impossible. Country boats plied in Barak, connecting it to Meghna, a river in Bangladesh, and further south up to Dacca. Tripura was badly connected with adjacent provinces. Writing about Tripura, William Hunter (1876) observed: 'There is no road worth the name in the hill Tipperah, the capital itself is cut off from rest of the world for want of land communication, the route by water being only option in rains'. The kings and officials in Tripura in the nineteenth century had introduced a system known as *taitun* system. Under this system, whenever the king and the officials moved in the countryside, the hill people had to provide the labour to carry the goods from village to village. This was accompanied by '*foorai*', a royal insignia made of iron and a symbol of imperial power. Whatever and whenever the orders arrived with *foorai*, the hill men had to obey it and *foorai* was conveyed from village to village. This system involved a kind of slavery, though not quite similar to *paik* system of Ahoms, as in the latter case it meant a compulsory service for part of the year, but the *taitun* system demanded only occasional labour.

There were two principal modes of transport in Tripura: river and elephants. Whatever little goods like cotton, timber, bamboos, grass or other jungle products were to be transported, they were all taken by small boats. Besides, in the hilly areas with moderate slopes, or in other difficult conditions, elephants, which were found in abundance in Tripura, were used for carrying different products. There were very few roads, confined to the capital and its vicinity.

18.1.3 Transport in the Hilly Areas of the North-East

Before the arrival of the British, no roads, whatsoever, existed in the hilly areas of Arunachal Pradesh, Nagaland, Manipur, Mizoram or Meghalaya. Even after the British started ruling Assam, the focus was largely on Assam and Cachar plains.

In Lushai Hills, the present Mizoram, there was no proper road, till the beginning of the nineteenth century, to connect Mizoram with the rest of the region. There was a solitary bridle path between Silchar and Aizawl. Much of the goods traffic was moved up the Dhaleswari river up to Sairang, a riverside settlement, about 20 km from Aizawl. The journey between Silchar and Sairang rowing up the Dhaleswari river took 12–20 days, while the voyage downstream took 4–5 days, to cover this distance of 200 km. In the hilly tract, the British had gradually established several bridle paths, like the ones from Aizawl to Lunglei and thence to Demagiri en route to Chittagong, Aizawl to Phaleng and Aizawl to Vanlaiphai. The state of Mizoram, then Lushai Hills, had only 6 km of cart road and had over 800 km of bridle paths in the beginning of the twentieth century.

Manipur was in a better position in the matter of road transport. Following the revolt in the state of 1891 against the British, the road links to Manipur and Nagaland was expedited. Imphal was linked to Silchar by a bridle path via Bishenpur. Besides, there was another bridle path in Manipur that led to Burma via Thoubal to Tammu and thence across the Kubo valley into the valley of Chindwin. Manipur was linked to Brahmaputra valley by a cart road that reached Golaghat via Kohima–Dimapur link. Thus the present national highway no. 39 was a mere rough cart road till the 1920s. Initially built as a cart road in the beginning of the twentieth century, the road from Imphal to Dimapur, a difficult stretch crossing the Barail range, a great divide between the Brahmaputra and the Barak, south of Kohima, and then moving down the Dhansiri valley further north to Golaghat, has become a historic road that has witnessed the march of some of the mightiest armies of the world. The Allied forces and the Japanese troops fought the famous battle of Kohima during the closing years of the Second World War, ending in the defeat of the Japanese troops, forcing them to retreat. The road, now the highway no. 39, commemorates the heroic deeds of Naga warriors without whose support the Allied forces could not have won this bravely fought prolonged battle. In Nagaland, besides linking Kohima to Dimapur, the cart road was extended further north to Mokokchung in the Nagaland territory. Bullock carts were introduced in Manipur in the beginning of the twentieth century, but their number multiplied fast and soon carts became the most important mode of transport.

The most important road that was built on priority was the one linking Guwahati with Sylhet via Shillong. The GS (Gauhati–Shillong) road, a stretch of 105 km, was completed in 1875 and extended further south to Cherrapunji, Therriaghat, Companyganj and Sylhet, originally in Assam but now in Bangladesh. This was the lifeline of the British administration, the shortest land route between north and south Assam, and connecting Surma valley in Bengal with Brahmaputra valley in Assam. Other roads connecting different parts that were built early in the British rule were Tura–Goalpara link, another link road linking northern bank of Brahmaputra, opposite Guwahati, to Darranga at the foothills of Bhutan, Rangmatighat to Mangaldai subdivision, Sibsagar to Disangmukh and Silchar to Hailakandi.

The most important trunk road, improved or built in the late nineteenth and early twentieth century, was the South Trunk Road, starting from Fakirganj

on Brahmaputra, opposite Dhubri, to Saikhowa opposite Sadiya in the eastern extremity of Brahmaputra valley. Presently recognised as national highway no. 37, the road, some people contend, existed even during the Ahom period, with multiple badly connected links. Also called Brahmaputra valley road, the forerunner of NH no. 37 was built after 1865, linking important towns of Assam valley, and is the main trunk route and the lifeline of the state, even today. Similar may be the case with the national highway nos. 31 and. 54, on the northern bank of Brahmaputra. How much the present alignment has followed the old sixteenth century route, laid by the Koches, is difficult to determine, but it seems that the two east–west trunk lines, one each on the northern and the southern side of Brahmaputra, have a medieval origin.

Arunachal remained without proper road till after the First World War. Since the area was initially represented by Balipara and Sadiya Frontiers, then NEFA (North-East Frontier Agency) and finally Arunachal Pradesh roadwork, though on a very modest scale took place only after Second World War. What did exit earlier was the Tibetan trail of traders moving south from Tawang to Kariapar or Darranga during winters to exchange goods. After the First World War and the Simla Agreement in 1914, the route from Tezpur to Tawang was improved and in due course made motorable. The other short routes from Brahmaputra valley to some major settlements of the state were completed recently. The route from Tezpur to Pasighat till a few years ago was not quite motorable. It had still the old timber bridges, covered with wooden rafters. Often, in the non-rainy season, the river crossing was negotiated by a side muddy track. In Arunachal, being a border state and strategically important, both road and railways are being renewed to improve transport.

18.1.4 The Contemporary Road Network

The present network of roads is largely the result of modification, improvement and strengthening of the existing old roads. Most of the roads were old mud roads, converted into all-weather roads, with offsets to provide access to local settlements.

The broad pattern of road network in the North-East and particularly in Assam consists of two parallel and subparallel roads and railway lines on both sides – north and south – of Brahmaputra. The old route now NH 37, one of the busiest arteries of the North-East, has its correspondence in NH 54, which runs all along the length of Brahmaputra, on its north, from Gossaigaon in the west to Pasighat on Siang (Brahmaputra) on the east. The east–west southern route, south of Brahmaputra, runs from Guwahati to Tinsukia and beyond. These two routes (NH 54 and NH 37) together handle over three-fourths of the entire road traffic of Assam. There is no highway in the North-East, with such an enormous traffic load, as the one between Guwahati and Dibrugarh. This road passes through the most densely populated part of Assam, replete with vast paddy fields, tea gardens, occasional factories and the Dibrugarh–Tinsukia industrial complex.

The northern road (NH 54), which occasionally utilised the sixteenth century Gohain Kamal Ali, is a parody of a national highway; at least it was so till 2006, when this author travelled from Tezpur to Pasighat on this road. Badly surfaced, this road with many rough patches, poor alignment and damaged bridges, some supported by old timber columns, built perhaps a century ago still existed. The rivers had to be crossed along a mud track artificially made by frequent passage of vehicles. It is a sad commentary on the government which claims to shower special attention on the North-East. These timber bridges support a shaky structure which rests on wooden rafters that hobble and oscillate when a small vehicle passes over them. Belatedly, the road is being changed into a genuine highway as a part of fast-track transport development in North-East India.

These two east–west arteries, each on the north and south of Brahmaputra, following similar alignments are linked in a few places. It must be mentioned that the bridge on Brahmaputra is exclusively an enterprise of the Republic of India. Brahmaputra was not bridged during British period. The first bridge was built in 1963 (Saraighat bridge) near Guwahati, the second was at Silghat linking Tezpur on the northern bank of the river, the third bridge known as Nar Narayan *Setu* was built linking Jogighopa and Goalpara on the opposite site of Brahmaputra, and the last road bridge is at a point about two kilometres upstream of Pasighat.

The main transverse roads that enter Arunachal Pradesh from NH 54 are:

1. Tezpur–Tawang road via Bomdila. This road following Bharali (Kameng) river and its tributaries upstream traverses at considerable height and passing through Bomdila, and the famous Sela Pass (4,249 m ASL) descends into Tawang valley, reaching Tawang town (over 3,000 m ASL) that is known for its seventeenth-century Buddhist monastery. This road is the one that turned into a war theatre, during the Chinese aggression in 1962.
2. Another well-trodden route in Arunachal Pradesh is a bifurcation from NH 54 going up the mountainous terrain to Ziro, the headquarters of Lower Subansiri district; running further North-East to Daporijo, the headquarters of Upper Subansiri district; moving further east to Along, the headquarters of West Siang; and then turning North-East to Pasighat, the point where Siang debouches from the hilly terrain and enters into Assam plain as Brahmaputra.

The four districts of Arunachal, viz. Tirap, Changlang, Lohit and Dibang valley, are badly served by road network. With not many bridges, road transport has to depend, of necessity, on ferries. Nagaland, as compared to Arunachal Pradesh, has a better network of roads. All the district headquarters and the subdivisions are linked by roads, though of questionable quality.

18.1.4.1 External Communication Link of the Region

Before the British arrived on the scene, there were two or three important land routes that connected the region with Bengal and the rest of India. The road to other

parts of India was along the northern Trunk route via Cooch Bihar. The most intimate link of the state was with Bengal connecting the following two land routes:

(a) Murshidabad – Maldah – Dinajpur – Rangpur – Bugwah – Singimari – Goalpara
(b) Dacca – Dumary (Dhanbari) – Jamalpur – Singimari – Goalpara

The first route crosses Brahmaputra 40 km south of Dhubri where the channel narrows down, while the route starting from Dacca (Dhaka) goes straight north to Singimari in Goalpara district avoiding any need of crossing Brahmaputra.

18.1.5 Transport Development During the Colonial Period

The development of the transport network in the North-East region is a fascinating story of how the transport network, as much as many other economic activities, was geared to promote the colonial interests of the British Empire. The colonial trade policy of the British was to collect raw material for the industries in the United Kingdom and market their finished product in the colonies. The transport network that the British developed was also meant more to guard their strategic interests. A transport system, efficient and speedy, helped them strategically in so far as it enabled the government to rush troops from their garrison cities and cantonments to crush any revolt or even an organised opposition to their economic policies, particularly related to land tenure and rent regime. Secondly, it enabled them to collect raw material like jute and cotton, fuel and mineral resources like coal and petroleum and iron and plantation produce like tea for processing and exporting to Europe (Photo 18.1).

In Assam, the principal produce of tea and petroleum was the focus of attention of the government in the nineteenth century, and they linked the valley of Assam with Bengal and the seaport of Chittagong to harness maximum benefit from the export of these commodities and the sale of imported goods. This resulted in the development of Assam–Bengal railway and the introduction of regular steamer service between Dibrugarh and Bengal.

18.1.5.1 Transport in the Mid-Nineteenth Century: Brahmaputra the Principal Link Between Assam and Bengal

Between the development of Brahmaputra as an important waterway and the railway, the water transport received priority, as the development of railway link was a long drawn tedious process requiring laying of the railway line, over hundreds of kilometres, in a terrain, difficult by any account, and getting the rolling stocks and making it operational. As compared to this, river transport required commissioning of some steamers and the development of some ports of call. Immediately after the British took over the reins of administration around 1830, they lost no time in breaking the isolation of Assam and linking it to Bengal where they were fully established. Before the government took the initiative to organise a streamlined

Photo 18.1 A timber bridge, use of wooden pillars as columns, north of Brahmaputra, Eastern Assam (Photo S. R. Jog)

water transport in Brahmaputra, large boats used to ply between Calcutta and Gauhati, taking roughly 6–7 weeks, though smaller boats carrying mail took only 10 days. The first steamer service between Gauhati and Calcutta was started in 1848, which was extended up to Dibrugarh in 1953. The return journey between Gauhati and Dibrugarh took a fortnight.

In 1860, the Indian General Steam Navigation Company took over the steam navigation on Brahmaputra from the government and ran a pair of steam vessels between Gauhati and Calcutta every week. A daily mail service steamer between Dhubri and Dibrugarh was initiated in 1884. In the beginning of the twentieth century, there were two prominent steamer services. One of these was between Goalundo (the confluence between Brahmaputra and Ganga) and Dibrugarh, calling at each port of call, and the other was a mail service between Gauhati and Dhubri, which made the up journey in 20 h and the down journey in 11 h. The steamer service carried much of the petroleum and jute from Assam to Calcutta.

Barak river, in Cachar, was also an effective waterway during the rainy season when large steamers navigated upstream up to Silchar. In winter, the river channel was hardly navigable for steamers, and the journey had to be covered partly on land. The opening of the railways developed a system under which a combination of waterway and railway was used. One could travel by ferry from Silchar to Chandpur

on Meghna and from there move upstream on Meghna to Goalundo, where Brahmaputra joins Padma (Ganga of India) and thence by railway to Calcutta. Goalundo also known as Goalundo Ghat, a river port on the confluence of Brahmaputra with Padma, was vitally important for any traffic that was to terminate at Calcutta or that originated there.

Till the mid-twentieth century, river navigation was important in the transport system of Assam, despite the coming of the railways in 1905. Bulk of the goods from central and lower Assam was still transported by steamer, as it was secure and highly economical. The disruption in the river navigation was triggered by a very severe earthquake in 1950 that greatly affected the course of Brahmaputra with excessive silting, unexpected appearance of sandbars and changes in the cross profile of the stream to make it un-navigable. Improved connectivity of the state by the construction of the first bridge on Brahmaputra at Saraighat (near Guwahati) in 1962 made the railways more dependable. The Indo-Pakistani war of 1965 was the last event that permanently sealed the fate of river navigation, between Calcutta and Guwahati, through East Pakistan, now Bangladesh. Today, except for river crossing and local ferries, there is not much river navigation in Assam.

18.2 Growth of Railway Network in the North-East Region of India

Despite the fact that steam navigation had effectively connected Brahmaputra and Barak valleys with Bengal and the rest of India and a moderate network of road was established, there was no speedy transport in North-East India, as it was in the rest of the country. The idea to link Brahmaputra valley with Barak valley and the Bay of Bengal was conceived in the early 1980s of the nineteenth century. This was the Assam–Bengal Railway.

The motivation and the need for this railway line or others connecting the entire Brahmaputra valley were manifold, but the most important were, first, the direct shipment of raw materials and other commodities especially tea, petroleum and timber to Europe through Chittagong and, second, the strategic support required for effective control of the region and the need to reach disturbed spots in the shortest possible time. The project, for the nineteenth-century technology, was ambitious consisting of 1,185 km of railway line traversing difficult terrain involving marshy and flood-prone areas, large rivers and above all the Barail range that formed the divide between Brahmaputra and Barak and stood as a formidable barrier rising to 1,800 m ASL. The metre gauge line, extending from Chittagong in Bengal to Dibrugarh on the North-Eastern extremity of Assam, was built in stages and took over 10 years, from 1892 to March 1904. The most difficult part of laying the railways was drilling of over two dozen tunnels and building of around 75 bridges, some as long as 200 m, in the hilly section of North Cachar Hills. Chittagong was linked to Dibrugarh in 1904. The western extension of this railway line from Lumding to Gauhati was opened in 1897.

18.2.1 The Importance of Dibrugarh and North-Eastern Part of Assam in the Organisation of Railway Network

It may appear paradoxical to justify the primacy offered to Dibrugarh as a terminal for Assam–Bengal Railway, ignoring the more densely populated and the traditional core area of Assamese civilisation and culture, the western part of Assam valley. Gauhati, the historically reputed Pragjyotish, was initially bypassed. The reason was the business interest of the British colonial power. They developed Dibrugarh initially as a river port and a transit point for the export of tea, coal, petroleum and timber. The tradable commodities were brought from the hinterland, stored in the warehouses at Dibrugarh and transported for export by steamers plying over Brahmaputra. Linking Chittagong with Dibrugarh made collection and trading of commodities far more easy.

18.2.2 Development of Local Railway Line to Connect Tea Plantations with River Ports

Even before Assam–Bengal Railway was laid and started functioning as the principal mode of goods transport, quite a few local railway lines running a few kilometres with a narrow gauge were laid in upper and middle Assam. Some of these narrow-gauge short-distance lines laid in the last quarter of the nineteenth century are as follows:

1. Tezpur to Balipara built in 1895 (narrow gauge 39 km)
2. Rangpara to Barjuli
3. Orang to Singri river port

South of Brahmaputra a number of short railway lines radiated from Dibrugarh to cater to tea plantations, unconnected with the main railway line, before the arrival of the latter. Some of these lines were:

1. Dibrugarh Steamer Ghat to Jaipur road was opened in 1882 extended to coalfields in 1884.
2. This private railway line was further extended to Saikhowaghat on the southern bank of Lohit, facing Sadiya on the northern bank.

18.2.2.1 Railway Link Between Western Assam and East Bengal

The linking of western Assam and East Bengal without crossing the Brahmaputra was achieved in a piecemeal manner, and remained incomplete during the British period, as Guwahati could be approached from west only by crossing Brahmaputra over a ferry from Amingaon, a station on the northern bank of Brahmaputra opposite Pandu.

Extension of East Bengal Railway into Western Assam

Just before the completion of Assam–Bengal Railway with its terminal at Dibrugarh, the Government of Bengal, the people as well as the trading community, moved to link Assam with Calcutta directly. In 1902, Dhubri was linked with Calcutta by a metre gauge branch of East Bengal Railway that radiated from Calcutta, passed through Rangpur (now in Bangladesh), Golakganj and Gauriganj terminating at Dhubri. This line was extended in 1909 further east to Amingaon, a railway terminus on the northern bank of Brahmaputra opposite Guwahati. Originating from Golakganj junction, it passed through Basugaon and Bijni. Almost at the same time, the Assam–Bengal Railway was extended westward from Lumding, following a perfectly SE–NW aligned course of the river Kopili and finally joining Guwahati. This established a direct link between Dibrugarh in the North-Eastern extremity of Assam and Calcutta. But despite this railway link, both the major rivers Brahmaputra and Ganga had to be crossed by a ferry.

After the partition of the country, another line was laid in 1949 that took off from Alipur Duar in North Bengal and joined the existing line at Fakirgram (now in Kokrajhar district) to avoid passing through Bangladesh, the then East Pakistan. This line provided a direct metre gauge link between Assam, West Bengal and the rest of India. The earlier Assam–Bengal link connecting Assam via Golakganj, passing through East Pakistan, was closed after the 1965 war between India and Pakistan.

Conversion of Metre Gauge into Broad Gauge

Work on the conversion of metre gauge into broad gauge railway line started in the 1960s, and by 1965, only 290 km of railways in Assam between Jalpaiguri and Jogighopa passing through Bongaigaon was completed, and further conversion up to Guwahati and beyond waited till the late 1970s.

Bridging the Brahmaputra

More important than conversion was the erection of a bridge to link the two parts of the state, the area north of Brahmaputra and the part to the south. This could facilitate traffic across the Brahmaputra, opening up prospects of linking most parts of the state with the rest of India, without the cumbersome transhipment by slower ferry between Amingaon and Pandu, the two located on the northern and southern bank, respectively, of Brahmaputra. Despite all the technical achievement and the majesty of British Empire, the colonial rulers ignored the necessity and persistent demand to build a bridge on the river Brahmaputra that could facilitate movement even during heavy rainfall and the worst of floods.

That was a ‘bridge too far’ in British imagination. To build a bridge across this mighty river not only required a high level of technical competence, which the British certainly had, but a deep concern for the people of the state. The British were unconcerned; the cost far more outweighed the benefits emanating from such a bridge.

It was in independent India that the necessity and the urgency of building a bridge over Brahmaputra was realised, and the erection of a railroad bridge on Brahmaputra, joining the two banks of river at Guwahati, was undertaken in 1960. The bridge was completed in 1962, and an inaugural opening was done in June 1963, by the Prime Minister of India, Jawaharlal Nehru.

The bridge across Brahmaputra ushered in a new era in railway transport in Assam. It facilitated the transport of goods and passengers who could reach distant parts of Brahmaputra valley, on the same wheels from any corner of the country.

18.2.3 Extension of the Railways North of Brahmaputra

As in Dibrugarh region, small, truncated railway lines were also laid north of Brahmaputra, in the areas marked by a large number of tea gardens. The first railway line was laid in 1895 to connect Balipara with Tezpur to find access to the river port for the shipment of tea. Orang to Singri was another line to serve tea estates of the area. The real progress in mass transport took place with the opening of an east–west railway line almost parallel to Brahmaputra between Rangia and Tangla, a distance of 38 km in 1912–1913, extended further eastward to Rangpara in 1930 and further east up to North Lakhimpur, a distance of 175 km from Rangpara in 1960. Later, this line was further extended to Murkong Selek in the North-Eastern corner of Assam beyond which lay the braided mighty Siang, which further down assumed the name Brahmaputra. This metre gauge railway line running between Rangia junction, about 60 km north of Guwahati, and Murkong Selek a distance of 450 km was opened to public in 1963. Much of this northern railway, especially the section between Rangpara and Murkong Selek, was laid and completed after 1950. Thus, short railway lines, laid at intervals from tea garden territory to Brahmaputra, were finally integrated in a larger metre gauge trunk line traversing the entire stretch of Assam north of Brahmaputra. This railway line is being converted into a broad gauge, ensuring direct link between Northern Assam and Arunachal Pradesh and the rest of India.

The original metre gauge line between Alipur Duar and Dibrugarh passing near Saraighat bridge via Guwahati to Dibrugarh was converted into a broad gauge railway line in the 1970s. It has facilitated uninterrupted smooth flow of traffic between other parts of India and the eastern extremity of Assam marked by Dibrugarh. The southern extension of the original Lumding–Badapur line with extension to Silchar and Agartala is under conversion into a broad gauge.

18.2.4 The Railway Network and the Problem of Accessibility

The railway network in the North-East region is, for all practical purposes, confined to Assam; the hilly states have been left virtually untouched. Even today, not much progress is seen (Table 18.2).

Table 18.2 Railway network in the North-East region (as on 31 March 2003)

States	Broad gauge (km)	Metre gauge (km)	Total length (km)
Arunachal Pradesh	–	1.26	1.26
Assam	1227.70	1289.73	2517.23
Manipur	–	1.35	1.35
Meghalaya	–	–	–
Mizoram	–	1.50	1.50
Nagaland	11.13	1.72	12.85
Tripura	–	64.42	64.42
Total	1238.83	1359.78	2598.61

Source: Basic Statistics of NER (2006, North-eastern Council Secretariat, Shillong, p. 273)

There have been some changes during the last 6–7 years following a partial conversion of the Lumding–Badapur metre gauge line into a broad gauge and a bifurcated extension of this line, emanating from Karimganj up to Agartala.

As seen above, practically the entire railway network is confined to Assam. It is paradoxical, yet true, that the Rangia–Murkong Selek, 450 km long metre gauge line running parallel to Brahmaputra to its north, has never entered Arunachal Pradesh. One may interpret it differently. The demarcation of Arunachal–Assam boundary, subsequent to the establishment of this line, was so designed as to include the entire stretch of Assam, with the exception of only a small stretch that falls in Arunachal Pradesh. Similarly, railways touch only the margin of Nagaland at Dimapur, the largest trading centre of Nagaland, and run for a distance of 10 km in the valley of Dhansiri. Another point in Nagaland, on Assam border that is connected to the main Guwahati–Dibrugarh line is Naginimara. This is the terminal for Simaluguri–Naginimara track, extending up to Borjan, meant essentially to serve the coalfields in the area. The borders of Manipur have been touched by the extension of Badarpur–Silchar line running up to Jiribam, a small town on the western border of Manipur, midway between Silchar and Imphal.

Similarly, a branch of the North-Eastern Frontier Railway, taking off from Silchar, running southward along the valley of Dhaleswari, and passing through the towns of Lalaghat and Katlichara, reaches the border of Mizoram, terminating at Bhairabi in Kolasib district. This line is hardly functional, but may pave the way for future extension up to Aizawl, the capital of Mizoram, and beyond.

The Meghalaya plateau is not touched by railways, though its northern border reaches within 20 km of Guwahati. Why a railway line was not laid along with Guwahati–Shillong road (NH 40), or following a circuitous road to moderate the uphill gradient, is a question any visitor to Shillong would ask. The Meghalaya plateau with a maximum height of 2,000 m ASL is not insurmountable. Many attribute it to the reluctance of Meghalaya people to make the plateau easily accessible by the railways, out of fear of intrusion of a mass of people, alien to their culture. The situation appears to change, and it is believed that the state is now more amenable to establish a link with the main railway line that could ensure easy access to any part of India and offer greater opportunities.

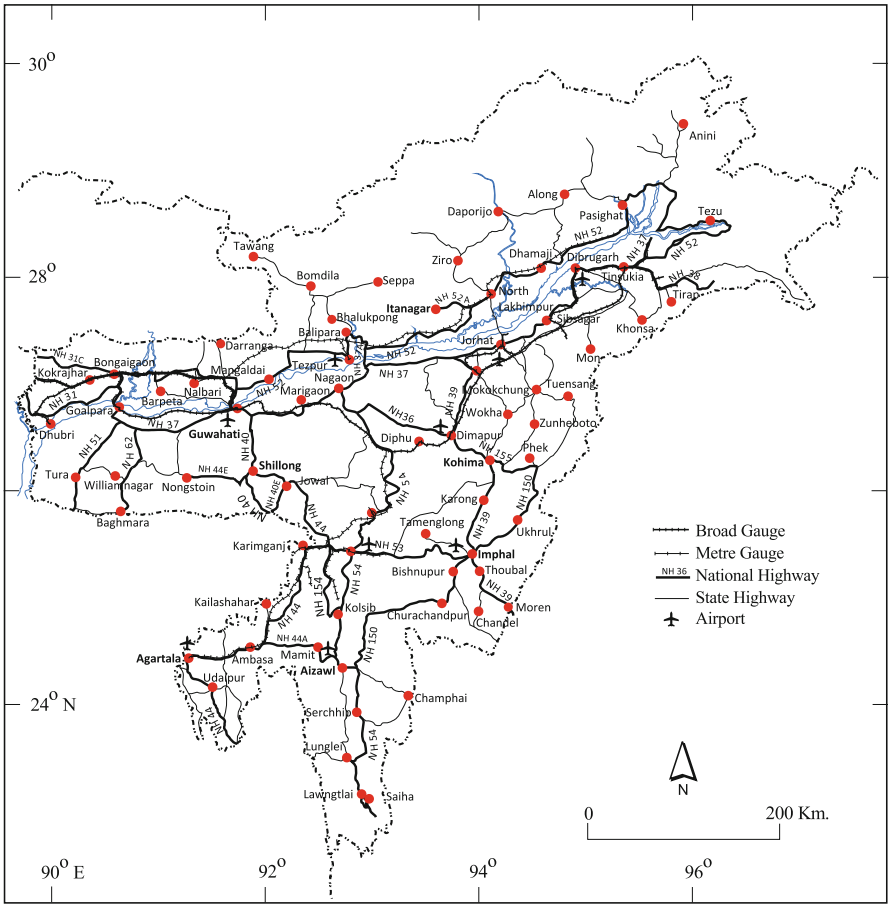

Fig. 18.1 Transport routes in North-East India

18.2.5 Alignment of Roads and Rail Network

All major roads and railway lines are aligned parallel to Brahmaputra, which also means passing through the entire length of Assam plain. Even in Cachar region, the Trans-Barail region of Assam, the transport lines are aligned to either Barak, the principal river of the area, or its tributaries (Fig. 18.1).

This is also the most judicious arrangement as it ensures accessibility to the largest number of settlements and population, which are concentrated in alluvial plains of these two principal rivers, Brahmaputra and Barak. Even where a north–south orientation of the transport line is required, these follow the valleys of the tributaries. The main broad gauge line from Guwahati to Dibrugarh winds its way along the Kopili valley, running SW–NE, and along Dhansiri, another tributary of Brahmaputra,

Table 18.3 Towns linked by branch lines to the main NE Frontier Railway

Town not on the main line (Guwahati–Dibrugarh), yet linked to a branch line	Stations from where the branch lines have taken off
1. Dhubri	Fakirgram
2. Nagaon, Dhing and Silghat (river port)	Chaparmukh Jn.
3. Golaghat, Numaligarh	Furkarting
4. Jorhat, Neamati (river port)	Mariani
5a. Sibsagar, Moranhat, Khowang	Simaluguri
5b. Naginimara	Simaluguri
6. Makum, Digboi, Ledo, Likhapani, Dum Duma, Saikhowaghat (all tea- and oil-producing area)	Tinsukia
Rangia–Murkong Selek line	
1. Dhekiajuli, Totelabasti	Dhekiajuli Road
2. Tezpur	Balipara

running almost parallel to the former. In both the cases, it avoids the hilly and dissected terrain of Karbi-Anglong, and at the same time keeps away from the flood-prone area of Brahmaputra.

18.2.5.1 Flood Proneness of Brahmaputra and the Transport Routes

The flood proneness of Brahmaputra with its annual floods, sometimes too severe, inundating large area of its plain, has kept both the towns and the transport routes at a safe distance from its course. It is very much unlike the Ganga plain where cities are strung along the river and the transport routes link the cities. In the case of Assam, except a few major cities like Guwahati, Goalpara, Tezpur and Dibrugarh, most towns are 15–20 km away from the river and avoid the fury of the river during the flood. A few, like the above-mentioned cities, that are on the bank of the river, have the advantage of being located on higher sites, where the channel of the river is constricted. This is the case with Goalpara, Guwahati and Tezpur. Dibrugarh as an exception was developed during the colonial period as a river port in the midst of tea plantation area.

Most of these towns are linked by roads, NH 37 in the south and NH 52 in the north of Brahmaputra, which keep a distance of 20–25 km from the river. The railway lines, on the other hand, run further inland benefiting from the protection offered by the elevated roads that check the spread of Brahmaputra waters further inland and thus secure the safety of the railway line.

Most of these towns, particularly those in the south of Brahmaputra, have been linked with the main line by a branch that sometimes reaches the river ports (Table 18.3). Thus, Nagaon, Dhing, Silghat (on the south bank of Brahmaputra opposite Tezpur), Golaghat, Numaligarh, Jorhat, Sibsagar, Moranhat and Saikhowaghat, north of the main line, and Digboi, Margherita, Ledo and Naginimara on the southern side are all linked with the main North-East Frontier Railway, terminating at Dibrugarh, by branch lines.

Some of these branch lines, like the one from Dibrugarh to Saikhowaghat or Tinsukia to Digboi and Margherita, were the old lines catering to the tea plantations of Assam.

18.2.6 Transport and the Problem of Accessibility in the North-East

18.2.6.1 Transport Network in the Hilly Areas of the North-East Region

More than the inadequacy of transport network, what is more alarming is the absence of any means of communication in many distant parts of the region. The largest state of the region, Arunachal Pradesh, with an area of over 80,000 km^2, has just over 20 km (21.93 km) of roads per 100 km^2 of its area, the lowest in the region. Similar is the case with Mizoram where the situation is not much better. But more relevant is the fact that even this limited length is confined to the narrow elongated alluvial plains that border the streams. In the hilly Arunachal Pradesh, the existing 51.8 km stretch of national highway is represented partly by an extension of NH no. 37, from south of Brahmaputra, and partly by a link of NH no. 52 that traverses the entire stretch of Assam, north of Brahmaputra. The national highway no. 52 links Itanagar by an extension of the mainline, and another extension taking off from Sonarigaon, opposite Dibrugarh, traverses a limited distance in Arunachal Pradesh before joining Pasighat, making a loop to return and join NH 37 at Tezu.

A large part of Arunachal depends on district roads constructed by Border Road Organisation. The northern districts of Arunachal particularly Lohit, Dibang valley, Upper Siang, Upper Subansiri and East Kameng are very poorly served even by unsurfaced roads. There are areas like Dibang valley with a population of 5 persons/km^2. Similar is the case with Upper Siang and Upper Subansiri where the density of population does not reach 10 persons/km^2. Large parts of these districts lie on the international border with Tibet, and roads should have got priority, as much for improving accessibility and economy, as for strategic reasons that require safeguarding the borders. In Mizoram, the transport routes run on ridges that form the divide between the valleys. Besides an insignificant length, half the roads are unsurfaced. In terms of length, Nagaland is better placed, though the roads remain in a pathetic state. The national highway no. 39 passing from Dimapur via Kohima to Imphal in Manipur is better surfaced and maintained.

18.2.6.2 Accessibility to North-East Region Through a Narrow International Transport Corridor

The North-Eastern region of India, after the partition of the country in 1947, has been rather isolated from the mainland, because of Bangladesh, the erstwhile East Pakistan, interposed between India and the North-East Indian states. Before 1947,

the transport scenario was quite different. Any part of Bangladesh, and the Assam districts of Cachar and Sylhet, could be reached directly from Calcutta, and Brahmaputra could be crossed at any point by a ferry at Tistamukhghat in the north, or any of the three ghats close to the confluence of Padma (Ganga of India), on Jamuna (Brahmaputra of Assam) or at Goalundo Ghat down the confluence, just about 40 km from Dhaka. With Bangladesh wedged in between West Bengal and Assam and Meghalaya and Tripura, accessibility to these states is quite precarious, except through a 20 km narrow corridor of Indian territory between Nepal and Bangladesh, starting from Naxalbari, the place of origin of the infamous Naxalbari movement, on the west and Siliguri on the east, with Bagdogra airport placed between the two. This 25 km wide east–west corridor runs for about 20 km north–south before widening into West Bengal territory. The narrow corridor – one may call it the Siliguri–Islampur corridor – is the only route for any overland communication between the North-Eastern region and the rest of India.

The result of this spatial organisation of the border territory makes this corridor the lifeline of the entire North-East. Any disruption of this route, roadways or railways, could be catastrophic for India and its North-Eastern territory. The tri-junction point between India (Sikkim), Bhutan and Tibet is hardly 80 km from Bangaband on Bangladesh border. Siliguri–New Jalpaiguri, the northernmost point of this corridor, before it opens out in Jalpaiguri and Cooch Behar districts of West Bengal, is a transit station, a hub of transport, and a paradise for trade in smuggled goods. This corridor is strategically very important and is to be guarded and preserved to avoid any unforeseen situation, caused by any natural catastrophe like floods and landslides and equally by infringement of border by neighbouring countries.

18.2.6.3 The Solitary Land Route to Nagaland, Manipur, Mizoram, Cachar and Tripura

Except for the fact that all these states are linked by air with each other and even with international airports like Kolkata or New Delhi, overland accessibility in these states is extremely restricted. The southern branch of the North-East Frontier Railway, now extended up to Agartala, is always under threat of the insurgents of the North Cachar Hill area. Besides, there are frequent dislocations, especially during the rainy season, following landslides. The only definite route is NH 40, which starting from Guwahati runs due south passing through Shillong, across Meghalaya plateau to terminate at Dawki, though during the British days, this highway descending down the plateau terminated at Sylhet, now in Bangladesh. A bifurcation of this highway runs southeast via Jowai as NH 44 and runs all the way south to Agartala via Badarpur on Barak. Another branch of it, emanating from Badapur and moving due east, terminates at Silchar, the focal point of Cachar and south Assam. From Silchar, two routes, one down south to Aizawl and the other running eastward to Imphal (Manipur), complete the picture. The all-weather roads NH 40 and NH 44 are aptly called the lifeline of south Assam, Tripura and Mizoram and an alternate route to Imphal. This road, carrying virtually the entire supply of goods for south Assam and Tripura, suffers frequent traffic snarls.

There is no well-maintained state highway in the region. The two cities of Meghalaya, Shillong and Tura, forming the focal points, one in the eastern and the other in the western part, are not yet linked on the plateau by an all-weather motorable road. Instead, travel from Shillong to Tura involves a detour via Guwahati thus requiring road travel of 300 km. This also shows that smaller places and villages are rather neglected. The hilly areas of all the peripheral states need greater attention.

18.2.6.4 Mountainous Terrain, Village Settlements and Accessibility

Location of settlements and the transport routes should have a congruent disposition. But in most areas, the settlements predate the contemporary transport routes. The village settlements in Mizoram, the hilly areas of Manipur and Nagaland are located on ridge tops, having a clear view of the surrounding areas, but not easily accessible. The transport routes, which are of relatively recent origin, have, to follow the ridge tops, to link many of the important villages. But a large number of villages are still untouched even by a dirt road, wide enough for a cart or any other four-wheeled vehicle, requiring sometimes several kilometres of walk. Unlike in a plain, where roads can be aligned to pass along the village settlements, the rough terrain, deep valleys and dissected terrain in the hilly areas make it difficult to align a route that could link the age-old village settlements.

Technically, it is feasible to take a road or a railway anywhere, but it is often seen as a trade-off between the socio-economic benefit to the people on one hand and the cost of the project on the other. A few roads that were built during the British regime in Mizoram and Nagaland or even Manipur and Arunachal Pradesh were purely guided by administrative convenience and strategic considerations. The only road in Nagaland, built during the British rule, between Kohima and Mokokchung via Wokha and beyond, in the western part of the state, was to connect the administrative headquarters of Kohima and Mokokchung. Similarly, Mizoram, the erstwhile Lushai Hills district of Assam, had only a single road, the ancestor of the present NH 54 that led from Silchar to Aizawl.

Accessibility to every village is a democratic concept and is the right of every settlement to be connected to a transport network and to bring the remote villages closer to the modern world.

Guwahati, the capital of Assam, is the hub of transport for the entire North-East region and the centre for all transport services in the region. Though all the states of the region have State Transport Corporations, the one of Assam is better organised.

Assam State Transport Corporation (ASTC) has a fleet of buses that connect all the state capitals, Agartala, Aizawl, Imphal, Kohima and Itanagar with Guwahati. Besides the ASTC, there is a large segment of transport operated by private owners. Buses, medium-sized vehicles and cabs operate on most of the intra- and interstate routes. There is no dearth of vehicles; it is the roads which are either in bad shape or have not reached all parts of the hilly states, to connect smaller towns and villages.

18.2.7 Air Transport

The North-East region is, comparatively, better connected by air than other states of India. This is attributed to several reasons. Firstly, the land connection to North-East is through a single, narrow, land corridor, and all routes have to pass through it. Access, therefore, is slow and long drawn because of traffic density. To overcome this bottleneck, air transport has been actively promoted in this region. Secondly, the region was close to the Burmese theatre of war, during the Second World War, and the Allied forces had developed a number of airstrips, as they had done in the rest of India. These airstrips have come handy in the post-war period and are converted into airports. Thirdly, the strategic importance in the region, having border with four countries – Bhutan, China, Burma and Bangladesh – requires better air connectivity, which is assured through these airports.

Looking purely from administrative and economic viewpoints, it is imperative that every state in the region has an air link with the rest of the country and above all with the national capital, Delhi. The peripheral states of the region, Arunachal Pradesh, Nagaland, Manipur, Mizoram and Tripura, each shares an international border, and a speedy transport and communication is strategically significant.

The hilly states are devoid of any well-laid road and rail transport. An air link partly compensates for this drawback. Thus, each state has an airport, or an airport, close by, in the neighbouring state.

State	Airports
1. Assam	1. Guwahati
	2. Jorhat
	3. Dibrugarh
	4. Tezpur
	5. Silchar
	6. Lilabari
2. Arunachal Pradesh	1. Air strip at Ziro
	2. Itanagar is served from Lilabari
3. Nagaland	Dimapur
4. Manipur	Imphal
5. Mizoram	Aizawl
6. Tripura	Agartala
7. Meghalaya	Barapani (operative only in dry weather)

All these airports are linked with Guwahati and Kolkata. Since all these states, with the exception of Assam, have small populations of two to three million and their capitals not exceeding a few hundred thousand people, they don't generate enough traffic. Most of the flights, therefore, emanating or landing on any of these airports, with the exception of Guwahati, have to take one or more landings, to pick up additional traffic. Several of these flights make a round trip from Kolkata touching more than one airport.

Guwahati, besides being an international airport, is the gateway to the North-East and a hub of air traffic. Most regional flights originate from or land here, from the adjacent airports in North-Eastern states, linking them with distant destinations. Guwahati is linked directly with several important airports of the country like Delhi and Mumbai.

18.2.7.1 Prospects of Road Development

Most authorities, and the public at large, think of only improving and extending the road transport. There is limited scope of railways being taken to all parts of the North-East region, at least in the immediate future. Reportedly, the Government of India has large plans to lay proper roads in Arunachal Pradesh, Nagaland, Manipur and Mizoram. There is a move to develop and use a Bay of Bengal port, either in Myanmar or Bangladesh, to link Mizoram and Tripura with a seaport. In this context, one may mention the survey and possible navigation in Kaladan river in Mizoram, which has its mouth at Sittwe (Akyab), on the Bay of Bengal, the latter being a well-established port and an airport. A concurrence of Myanmar could make this proposition a reality and open a direct sea route to Kolkata and other Indian ports, bypassing Chittagong port of Bangladesh.

18.3 Trade Practices of the North-East Region

Trade as an economic practice has been adopted by most societies in history, local, regional or international, depending on the reach of a community or its relation with other communities, for mutual benefit. At times, this useful practice has been abused, and trade in different commodities is promoted to serve the vested interest of a class or a colonial power, as in the past, or a trade block as in the contemporary world. While considering the trading pattern of the North-Eastern region, only local, regional or border trades are considered. International trade is between two countries though the commodities of trade may come from a specific region.

18.3.1 Traditional Trade Practices, Trade Centres and Trade Routes

Till the time of independence, the North-East had three independent political entities, the state of Assam and the princely states of Tripura and Manipur. The tribal communities of the region were free to trade not only with Assam but also indulged in some measure of trade with Myanmar. Manipur, having a common border with Myanmar, had as much trade with the neighbouring country as with Assam, particularly the Cachar region.

18.3.1.1 Trade of Assam During the British Period

The interstate trade, and even international trade of Assam, during the British period, was either confined to Bengal or linked to Europe through Bengal. For Assam, there were three noticeable trade routes through which much of the trade of the region flowed:

1. Through Bhutan and mountain passes to Tibet and Nepal
2. Down the Brahmaputra river to Bengal or Bay of Bengal, connected by a maritime trade to Europe
3. Through Cachar to Bengal via Tripura, and subsequently to Chittagong port, after the coming of Assam–Bengal Railway

Traditional Trade Through Bhutan

The barter trade, between Assam and the frontier states of Bhutan, Tibet and Nepal, was conducted at the trade centres, located at the entrance/exist of passes known as *Duars*. There were many such centres or *duars*, almost uniformly spaced from west to east, in Goalpara, Kamrup and Darrang districts. These were as follows:

1. Bijni Duar	In Goalpara district
2. Siddi Duar	
3. Chirang Duar	
4. Repu Duar	
5. Guma Duar	
6. Darranga	In Kamrup district
7. Subankhata	
8. Udalguri	In Darrang district
9. Ghagrapara	

Besides, there are several places in the foothill region of Darrang that carry the suffix '*Duar*' and provide access to the hills of Bhutan. Some of these are:

Chai Duar
Nau Duar
Char Duar
Khaling Duar
Buriguma Duar

Some of these *duar* centres have historical importance. Darranga located in Tamulpur circle of Kamrup, sitting just on the border of Bhutan, is, by far, the most important trade centre between the hills of Bhutan and the plain of Assam. It is also known as Darrangmela. The route from Guwahati to Darrang passes further inland and connects several centres in Bhutan. Equally important is Udalguri centre, though not quite on Bhutan border. The importance of Udalguri lies in its fair held

annually where customary '*Posa*', a kind of appeasement money, was offered to the tribal chiefs, especially those of Bhutias, Akas and Daflas, now known as 'Nishis'.

The Bhutias descended to the trading centres, mentioned above, in winter on their ponies. The imports from Bhutan consisted of cattle, sheep, small shaggy ponies, musk and woollen blankets, while the purchase by the Bhutias was largely of paddy, rice, cotton and other fabrics. The tribes, further east, in what is now Arunachal, used to bring rubber to Tezpur for being exported down to Calcutta.

The Border Trade in the Eastern Part of the Region

The border trade in the East was largely with Burma. The tribal communities, in Tirap and even Lohit district, had direct trade relations with Burma, though they also traded with the merchants in Assam plain. The trade on this border was confined to barter and exchange of commodities. The main important trade centre on the Burmese side was Bhamo, located on Irrawaddy and attracting people from across the Patkai range. The trade was essentially between the Singphos of Tirap and the Kachins of Upper Burma. The affinity of Singphos towards river Irrawaddy and Kachins is reminiscent of their provenance from where they migrated to Tirap, perhaps in the eighteenth century. The export to Burma consisted of handloom products, tea leaves, salt and beads, while the Singphos and other tribal communities imported '*Daos*', iron implements, spears, fishing nets, etc. There was a flourishing rubber market at Bisa in Assam where the rubber tapped from the jungle used to be traded. The Singphos also exchanged salt, obtained from brine springs, with the plainsmen of Assam, against rice and other articles of daily life.

The route to Burma was difficult and the goods were taken as 'head loads'. Even this route was not an all-weather route. This old route was restored during the Second World War to keep the supply line to Burma open and is known as the Stilwell road, after General Stilwell who commanded the Burmese forces. It was completed in 1943 but has since fallen in a state of disrepair. There is a proposal to repair and restore this road again. The border trade between Nagaland, then Naga Hills district of Assam, was restricted to the purchase of salt, thread and brass wire to make ornaments obtained from shops in Dimapur or Kohima. There was hardly any export from Nagaland except cotton, grown by Lothas in Wokha district, finding its way into the plains of Assam via Dimapur.

Manipur, for long a princely state, had the privilege of having many more shops than in Nagaland. But outside Imphal there was hardly anything like a permanent shop. Internal trade in Manipur was confined to Imphal, which had a large number of markets and afternoon *bazaars*, with several permanent shops.

The external trade of Manipur was largely through Cachar that was more easily accessible and only partly with Brahmaputra plain. The Manipuris were known for importing certain goods like tea seeds and buffaloes from Burma and exporting them onward to Cachar. The exports from Manipur consisted of rice, the state being a rice bowl, cattle, timber and bamboo, besides hides. Timber was floated on Barak to reach Silchar, and rice was carted to Dimapur. The hill people of the state,

coming from the peripheral hills, exchanged their products of cotton, chillies and lac with rice, salt, cloth and sundry articles, on bazaar days in the valley, often at Imphal. Manipur used to import cotton piece goods, yarn, salt, kerosene oil, dried fish and betel nuts.

Assam–Bengal Trade

In the seventeenth century, *the Ahom rulers seem to have adopted a policy of isolation*, *and forbade people either to enter or leave their territories*, and trade of Assam was conducted through merchants and caravans who visited Guwahati once a year. The traders were never allowed to meddle in politics, and no foreign trader was allowed to settle in Assam (Hazarika 1990). For regulating international trade, there was only one post located on the mouth of the river Manas. This was the control point from where the state officer, known as *Duaria Barua*, regulated the imports and exports of Assam, on behalf of the Ahom kings. There were two outposts for Assam, located at Goalpara on the south and Jogighopa on the north bank of Brahmaputra. From these outposts, Assam goods were despatched to Rangamati and Kandahar outposts of Bengal, under the supervision of Mughal officials. The Assamese exchanged their silk products, pepper, musk, ivory, gold, honey and other products for salt, saltpetre, sulphur and other articles. At the end of the eighteenth century, trade of Assam valley was conducted through the custom house at Hadira, north of Brahmaputra opposite Goalpara. On the British side, there was a colony of British merchants who conducted most of the trade. The basic import commodity in Assam was salt while the export consisted of lac, silk, mustard seed and cotton accounting for 75 % of the total export of Assam.

By the late nineteenth and early twentieth century, the picture was changed. Much of the trade, with the exception of tea, had passed into the hands of immigrant Marwaris locally known as '*Kayas*'. This enterprising community controlled not only the export–import trade but even the domestic trade of Assam, including local shops and weekly bazaars.

In the beginning of the twentieth century, the volume and range of commodities entering the interstate trade had grown considerably (Table 18.4). The export to Bengal, or routed through Bengal, included, besides tea, unhusked rice, oil seeds, coal, lime, timber, jute, raw cotton, lac, hides, oranges and rubber; and the state imported manufactured goods, food grains, cotton piece goods, husked rice, salt, sugar, kerosene, mustard and other oils, gram and pulses, tobacco and metals. Commenting on the nature of trade, Allen et al. (1909) remarked: 'The backward condition of the province is illustrated by the fact that it exports un-husked rice and oil seeds and imports husked rice and mustard oil'. Assam was both an importer and exporter of rice. While all the rice exported from Assam moved out from Barak valley, the imported rice found its destination in upper Assam, especially among the garden workers, known as coolies.

Tea export moved straight from the tea gardens to Calcutta by steamer, for export or to be marketed elsewhere in the country. A large-scale export was, however,

Table 18.4 Rail and river-borne trade of Assam with other provinces (value in thousand rupees)

	Articles	1890–1891	1903–1904	Percentage of total import
Imports foreign and Indian goods	Cotton twist and yarn	955	908	
	Cotton piece goods	8,677	8,956	32.80
	Gram and pulses	972	1,425	
	Metals	2,714	2,883	10.56
	Oils and kerosene	939	1,038	
	Oils and others	1,214	1,409	
	Rice (husked)	615	1,987	7.28
	Salt	2,055	1,445	5.20
	Sugar	1,924	2,810	10.20
	Tobacco	884	1,261	
	All other articles	6,154	13,168	
	Total	*27,103*	*27,290*	
Export				**Percentage of total export**
	Rubber	363	118	
	Coal and coke	1,058	1,549	2.02
	Cotton raw	152	314	
	Hides and skin	217	932	
	Jute	852	1,799	2.35
	Lac	113	492	
	Oil seeds	3,608	3,551	4.64
	Oranges	230	1,358	
	Rice (unhusked)	3,274	4,218	5.50
	Stone and lime	683	291	
	Tea	33,974	55,181	72.00
	Wood	–	1,657	2.16
	All other articles	3,824	5,100	
	Total	*48,348*	*76,560*	

Source: Allen et al. (1909:87)

conducted through the port of Chittagong that was connected with the tea gardens of Assam by Assam–Bengal Railway. This part of the trade was almost exclusively in the hands of British trading companies. All the other commodity trade, both domestic and of interstate nature, was monopolised by Marwaris. They not only handled much of the wholesale business of the state, but their retail shops were found in every tea garden, and even on the routes frequented by hill people from whom they bought cotton, lac, rubber and other products. After the introduction of Assam–Bengal railway and steam navigation, there was little road traffic between Assam and Bengal. The roads were used for herding cattle, ponies, sheep and other livestock. Evidently, cotton piece goods, metals, sugar, rice and salt were the major import commodities accounting for 32.8, 10.56, 10.2, 7.28 and 5.2 % of the total import respectively. On the export side, about three-fourths of the total export, measured in terms of monetary value, was of tea, followed by food grains,

like unhusked rice, and oilseeds, specifically mustard and other raw materials like cotton, jute, hides, rubber and wood, besides minerals like limestone and coal.

The situation is changed drastically during the last 60 years. Firstly, all the export has to be routed overland by railways: Using Brahmaputra waterway, as a means of transport, is impractical, as it requires transit at international border with Bangladesh, and is relatively slow and risky. Major source of import in the region has changed from Bengal to other states of the country, and export destinations are also widely diffused.

The most significant change in the last 60 years is the end of the colonial era and the withdrawal of British trading interests. The plantations and the export of tea were in the hands of British companies, and the control of tea garden management was exercised by the tea plantation companies like 'Williamsons' from London or through their overseas offices at Calcutta. Calcutta was also the tea auction centre. Secondly, the dominance and a veritable control of Assam tea trade, through the tea auction centre at Kolkata (Calcutta), have ended. The tea plantations in the state are now owned by Indian companies and a tea auction centre established at Guwahati. It has to be emphasised that before independence, Assam was directly linked by railways only with Bengal, and all nondomestic trade took place with Bengal either as direct sale to the users of the commodities or as intermediate destination for onward transmission, to other parts of India or for export. The opening of a direct railway link with the rest of the country has done away with the region's dependence on Bengal for its trade.

18.3.2 Contemporary Trade of the North-East

For most of the North-Eastern region, the only route for import or export of heavy cargo is by railways which are streamlined and well connected with the rest of the country, as well as the nearest seaports of Bengal.

18.3.2.1 Trade Commodities of the Region

Besides tea, silk and rubber, which are the traditional exports of the North-Eastern region, petroleum has entered the trade of Assam in a big way. With fresh discovery of oil and natural gas reserves, the number of refineries in the region has increased from a single, 100-year-old refinery at Digboi to four petroleum refineries, located, besides Digboi, at Bongaigaon, Guwahati and Numaligarh. Petroleum and petrochemicals are major items of export today, in addition to tea, which still remains the most valuable export trade item of Assam (Photo 18.2).

Thus, besides the traditional items like silk, timber, plywood, ivory, unhusked rice and mustard seeds, the most significant addition is that of petroleum, petroleum products, fruits, especially pineapple and oranges, and lately rubber and spices.

Photo 18.2 Arrival of freshwater fish from neighbouring Bangladesh on the international border on the outskirts of Agartala (near the border checkpost)

Tea has retained its dominant position as the most important commodity to be exported from Assam. The bordering states have no pretension to the status of an export- oriented state. Introduction of apples and exotic fruits like 'kiwi' in Arunachal Pradesh, and an overall encouragement to horticulture, the growth of silk industry, the setting up of wineries in Mizoram and the expansion of rubber and 'litchi' fruit in Tripura are all steps to produce exportable commodities. This may, in due course, boost the production of a variety of fruits, wine and other alcoholic drinks, and the export of these commodities could enhance the income of the states, in the region.

On the import side, the state imports a variety of high-tech goods that include machinery and machine-made goods, textiles and a variety of articles of daily use.

Serious efforts are being made by the state governments of the region to promote export. For this, they have set up Export Promotion Industrial Park. Similarly, the state has earmarked Agricultural Export Zones (AEZ), particularly of fish and ginger with the support of Agricultural and Processed Food Products Export Development Authority (APEDA). The Export Development Authority has centres at Dibrugarh, Nagaon, Goalpara and Silchar. The commodities exported from Assam include tea, petroleum, petrochemicals, silk, jute and a number of agricultural and horticultural products like betel nuts, pineapple, plywood, timber and timber products. The state imports specific varieties of edible oil.

18.3.2.2 Wholesale Trade Centres

The most important wholesale trade centre in the North-Eastern region is Guwahati. Being the focal point of the entire North-East and having acquired a variety of socio-economic functions, like professional colleges, specialised medical faculties, a High Court of justice, a university and several other institutions, there is always a congregation of people, and the city serves as a wholesale trading centre, for acquiring goods from other parts of India as well as distributing them to the retailers in other towns of the region. Another important centre of wholesale trade, at the other end of Brahmaputra valley, is Tinsukia with the advantage of being the centre of an industrial region, with industries such as petroleum, tea, coal and forest products. The city, being terminus of the North-East Frontier Railways, is connected to a large hinterland, which includes eastern part of Arunachal Pradesh, northern Nagaland and the upper districts of Assam. Tinsukia is the most important food grain market, receiving supply of food grains from other parts and distributing it in the region. There are other wholesale trading centres like Barpeta, Tezpur, Sibsagar and Silchar in Assam, Dimapur in Nagaland and Agartala in Tripura. Most of the peripheral states depend for their wholesale trade on Guwahati. To facilitate export trade with Bangladesh that passes through Dhubri or other western districts of Assam, the state has set up a Border Trade Centre (BTC) at Mankachar in Dhubri district.

18.3.3 Local Trade

Local trade, in all the districts of Assam as well other states, is conducted usually at district headquarters and traditional trading centres known for specific commodities. Besides, traditional periodic markets continue to function. In addition, the state government has sponsored State Trading Corporation and the District Marketing Societies. These societies, often working under the direction of the State Trading Corporation, are meant to procure food grains, largely paddy, firstly to offer a minimum support price to the farmers and secondly to release the food grains to the needy people at a moderate rate during period of scarcity, when the prices of the open market tend to move upward.

18.3.3.1 Periodic Markets

The non-permanent markets in the form of fairs represent an age-old tradition and date back to a period when the present organised market economy and permanent shops were rare. Such periodic markets are yearly, half yearly, fortnightly, weekly or even biweekly. Some of them like the border fairs of Darranga held once a year lasted for 1 or 2 months every winter. The weekly or biweekly markets are the most convenient modes of retail trade. These market centres occur at suitably spaced locations where peripatetic vendors of specialised commodities and ordinary market

traders meet once or twice a week. These markets attract a large enough clientele from the adjoining area to support the trading activity, making it economically viable and advantageous to both traders and the countryside peasant buyers.

18.3.3.2 Weekly and Biweekly Markets in the North-East

Locally called '*hats*' or 'bazaars', the weekly markets are a common feature of Assam, Cachar plain and Tripura. Some of the hilly states are also known to have nurtured a system of weekly markets. 'There is not much trade amongst the Nagas except in beads and shells. Each household produces practically all that it consumes and there is no surplus for disposal…. There are no such things as village markets, and hardly any shop except in Kohima bazaar, and here and there along the cart road'. In Manipur, there was a system of weekly bazaar, which continues even to this day. The Imphal afternoon bazaar is still well known and the one managed largely by ladies is a tourist attraction, besides being very efficient. There were about 20 places outside Imphal where weekly or biweekly bazaars were held, but the hilly peripheral area had hardly any bazaar, and the hill tribes used to descend to the fringe of the plain to a market place to engage in any marketing they ever had to do.

In the beginning of the twentieth century, the entire domestic trade of Manipur was carried on in markets held in open air, and outside Imphal a regular shop was unknown. Things have changed radically now. Many of the bazaar centres in the valley have grown into towns with an array of shops. Equally, the headquarters of the peripheral hilly districts like Senapati, Tamenglong or Churachandpur have also their shopping streets with some well-laid permanent shops. Besides, the institution of weekly markets has also appeared in most districts and circle headquarters.

The interface zone between the hills and the plains was the most important area for weekly markets for the benefit of the hill people. Besides the *duars*, already mentioned, another apt example is the 'border *hats*' between Garo Hills and Goalpara. Among a number of places where border *hats* were held for the Garos, Damra, Jira, Nibari and Patamari were well known. These places with their weekly markets used to collect mustard, jute, cotton and lac from the hill people and offer a large variety of goods like rice, salt, pulses, oil, cotton thread, sugar piece goods and tobacco.

18.3.3.3 Distribution of Fairs and Weekly and Biweekly Markets

What are commonly known as religious-cum-trade fairs are usually held at some important religious place. 'Shivaratri' and 'Sankranti' are the two religious festivals when fairs are held in most districts of Assam, but more specifically in lower Assam region. In Dibrugarh and Tinsukia, the two industrial districts, Diwali is an important festival when a fair is held.

Photo 18.3 Tezpur, hand-carts near the market

Besides a number of religious fairs called *Dolijatra*, *Rashotsav* or *Sankar Utsav* (in Nagaon district) celebrating the birth of Shankar Deb, *Pacheti mela*, celebrating the birth of Lord Krishna, and *Bohagi* and *Mohamaya melas* are also held. *Mela* literally means a fair, and these *melas* effectively function as much as trade fairs as the occasions for religious celebrations.

There is an abundance of fairs in Tripura, with the maximum number occurring in the 3 dry months of January, February and March. Those attracting large attendance are Siva Chaturdashi and Baruni mela (sacred bath of Chaitra). The greatest of all fairs in Tripura is the 'Karchi Puja' mela, held at old Agartala in the month of July, lasting for 3 days. The fair that represented a prominent landmark in the calendar of Tripura was the Baisakhi mela, held in the month of 'Baisakh' (April) under the patronage of the Maharaja of Tripura. This has, however, been discontinued since 1956.

18.3.3.4 Weekly Markets in Assam

These are ubiquitous and a permanent element in the local trade of Brahmaputra and Cachar plains and in Tripura. They are relatively uniformly spread, filling in the space, which remained un-serviced earlier. These weekly markets are more closely spaced in more productive agricultural areas, with high density of population. Their density varies with relief, agricultural production of the rural areas and the density of population (Photo 18.3).

Table 18.5 Number and service areas of weekly markets

District	Area (km^2)	Population	No. of weekly markets	The command area of market (km^2)	The population of the tributary area of the market	Inter-market distance (km)	Maximum distance a client is required to walk (km)
Kamrup	9,863	2,854,183	179	55.1	15,945	8	4
Goalpara	10,359	2,225,103	188	55.1	11,835	8	4
Karbi-Anglong, N. Cachar Hills	15,237	279,726	40	381	6,993	21	10.5

Sources:
1. District Gazetteer of Kamrup, Government of Assam (1990:376–80)
2. District Gazetteer of Goalpara, Government of Assam (1979:242–246)
3. District Gazetteer of Karbi-Anglong & North Cachar Hills, Government of Assam (1979:191–192)
Note: The area and the population of these districts are as they existed in 1971

It has to be emphasised that the importance of these weekly local markets – called *hats* in Assam – has not declined over the decades and centuries, despite the economic growth and better marketing facilities in towns where shops are a regular feature. Their number has increased several folds, as much as their density in space. A large section of the rural population, particularly the marginal farmers and the traditional petty traders, find it convenient to meet at these weekly markets. The traditional familiarity, the usual practice of haggling and bargaining, regardless of the volume of sale or purchase, and the availability of goods most needed by the country folks are the factors to keep these weekly markets alive. The farmers find it convenient to sell even a small part of their garden products – vegetables, betel nuts, food grains and other minor produce. But, it is essentially a market for the sale of all sundry wares, starting from food grains and vegetables to earthen pots, household goods and small manufactured utility products.

18.3.3.5 Range and Threshold of Weekly Markets

As a broad indication, one may offer the situation of weekly markets in two plain districts of Kamrup and Goalpara and a partially hilly district of Karbi-Anglong and North Cachar Hills.

As can be seen, the weekly markets have a command area of 50–60 km^2 in Brahmaputra plain, while it is much higher in the sparsely populated hilly areas of Karbi-Anglong and North Cachar Hills (Table 18.5).

A weekly market in Assam plain services roughly 15,000 people. The actual number of visitors to the weekly market may be smaller or may swell on important occasions, like a religious festival. Besides, certain markets develop reputation for certain products and may attract clients even beyond the range of the market. A weekly market in Assam has a tributary area of approximately 50–60 km^2, whereas

in the hilly districts, as in the case of North Cachar Hills, the service area is much larger and the number of markets smaller. The inter-market distance is determined by the density of markets which, in turn, depends on the population density of the region. The distributary area of the markets is obtained here by dividing the area of the district by the number of markets. This is based on the assumption that the markets are uniformly spread, a highly improbable proposition, and hence the catchment area of a market, given in the table, is an approximation. Doubling the radius of the assumed circle, representing the tributary area, gives the inter-market distance. Similarly, a buyer will not travel a distance longer than the radius of the circle representing the service area, unless there are special reasons. Hence, radius of the circle is taken as the travel distance of a market goer.

What is surprising is that despite increasing urbanisation and the growth of individual towns, the existence of these weekly markets is not threatened. These are the most convenient service centres for the population of neighbouring villages. These are one of the oldest marketing institutions, and howsoever dusty, disorganised, crowded and noisy they may appear to the city-bred folks, they have a special attraction for the rural people who do their marketing in a familiar and informal milieu.

Another reason for their robust persistence is the social function they perform besides purely economic one. Weekly markets are the meeting grounds for the people of the surrounding villages. Many other social exchanges take place and bargains settled. As the situation stands, the weekly markets are likely to continue in the region, albeit a tad modified.

References

Allen BC (1905a) Naga Hills and Manipur: socio-economic history. Reprinted 1981, Gyan Publication, Delhi, p 59

Allen BC (1905b) Assam District Gazetteers, vol IV, Kamrup. Reprinted 1995, p. 43 Government of Assam, quoted in J Asiat Soc Bengal 41(pt. I):49–100

Allen BC, Gait EA, Allen CGH, Howard HF (1909) Gazetteer of Bengal and North-East India. Reprinted 1979, Mittal Publications, Delhi

Basic Road Statistics of India, 2001–2002, Ministry of Shipping, Road Transport and Highways, Government of India, New Delhi, quoted from Basic Statistics of NER (2006) NE Council, Shillong

Government of Assam (1999) Gazetteer of India (1999) Assam State, Assam State Gazetteer, vol I. Guwahati, p 113

Hazarika BB (1990) Gazetteer of India, Assam State, vol. 5 Kamrup District. Government of Assam, Guwahati

Hunter WW (1876) Statistical account of Hill Tipper. In: Statistical account of Bengal (reprinted), vol VI. D.K. Publishing House, New Delhi, p 507

Rahman SM (ed) (1967) Gazetteer of India. Sibsagar District. Government of India, Shillong, pp 228–229

Chapter 19
Socio-Economic Development of the North-East: An Assessment

Abstract In any objective assessment of the North-East region, one finds variety and richness in its cultural and literary achievements, yet the economic picture looks subdued, if not outright dismal. Economically, the states of the North-East have to depend heavily on the support of the Central Government. Most of the states of the North-East receive, and justifiably so, a large contribution to their budget, not only their share of central taxes but a far greater share, in the form of grant-in-aid. The states of the North-East have to strive to ensure a healthy life, including proper nutrition, education, health care and a harmonious community living for their citizens. Any initiative in this direction requires resources besides a determined planned effort. A sound economy is, therefore, the sheet anchor for a healthy society and provides the necessary support for its cultural and literary achievements.

Much that is written earlier in this volume relates to 'land and life' in the North-Eastern region of India. The present chapter aims at giving an overall picture of the economy of the region and the state of welfare of the society. Most states of the North-Eastern region produce their own Human Development Reports which cover substantially such aspects as education, health, income and poverty, infrastructure, status of women and their empowerment and several other attributes associated with the functioning of a democratic society. Generally, many attributes of human development are driven by the economy of the region, though it must be emphasised that human development and social welfare also reflect, in a large measure, the impact of cultural tradition of the society, level of education, a responsible citizenry and above all the awareness of, and the respect for, the rights of other fellow citizens.

There is no specific yardstick, or a definite benchmark, to evaluate the level of economic development and the social welfare of a region. At best, it could be a comparative study examining the status of the North-East vis-à-vis other parts of India or even other countries. A comparison with India as a whole, or its constituent parts, may not appear quite appropriate and may invite the criticism of being a

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comparison between areas representing different levels of underdevelopment, as India itself is not a model of a socially or economically developed state. A comparison, on the other hand, with developed countries of the West, like the USA or Germany, would appear like accepting capitalism as an ideal economic model, disregarding the sociocultural roots of the society. Indeed, the world has yet to evolve a measure of prosperity and human welfare that is shorn of all prejudices and keeps in view the regional perspective, a model that is universally applicable and, at the same time, acceptable to local communities.

Leaving aside these broader questions, the attempt here is to evaluate the economic development and human welfare measures as these exist in the North-Eastern region of India and its constituent states. This would give a comparative picture of the achievements as well as areas of weakness, which require greater attention to bring the region to a reasonable level of development.

The indicators used here could be grouped in three categories, viz. economic, demographic and social. One may split them further into measurable indices that are comparable.

Economic Sectors:

1. Per capita gross state product
2. Annual growth rate
3. Shares of different sectors of economy, i.e. primary, secondary and tertiary
4. Net sown area per 1,000 persons in the state
5. Yield of important crops
6. Per capita production of food grains
7. Road length per 100,000 km^2 of area

Demographic and Social Indicators:

8. Density of population
9. Population growth rate
10. Infant mortality
11. Literacy ratio
12. Number of hospital beds per 100,000 population

The indicators suggested above may not give a complete picture, as a number of other considerations not amenable to quantification may be involved, but these may provide an approximate idea. The approach is to show, with some bold strokes, the level of economic development and the trends of growth and progress in different fields as compared with other states of India or the country as a whole.

19.1 Sources of Data

The constraints in picking up the indicators is not so much their availability as their reliability. Most data here are derived from the Ministry of Statistics and Programme Implementation, Government of India. Many of the economic statistics and indices

are produced by the states, through their Directorate of Economics and Statistics, and non-demographic statistics are taken either from the Statistical Reports of the states, their annual economic surveys or their annual budgets. An important source of statistical information for the North-Eastern states is *Basic Statistics of the North-East* published annually or bi-annually by the North-East Council Secretariat, Shillong, Government of India. This is a very useful volume, dependable for official data of the North-East region, comprising all the eight states (Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura). Another source of statistical information is the compiled data, periodically updated by North-East Development Finance Corporation, having its secretariat at Guwahati. All demographic data are taken or derived either from the Reports of Census of India or National Sample Surveys.

19.2 The Economy of the North-East Region of India: An Overview

The most commonly used indicator to understand the economic health of a country or a state is the per capita GNP (gross national product). In case of states, it is the per capita NSDP (Net State Domestic Product) that offers an approximate clue to the economic development of the state. To get a clearer picture, the per capita income has to be supplemented by achievements of different sectors of economy (Table 19.1).

Table 19.1 Per capita Net State Domestic Product (at current prices) from 1999–2000 to 2008–2009 (Rupees-INR)

	Years						Change in % for
States	1999–2000	2001–2002	2003–2004	2005–2006	2007–2008	2008–2009	1999–2008
India	15,881	17,782	20,871	26,003	33,283	37,490	+136 %
Arunachal	13,990	17,664	19,322	22,291	28,945	33,302	+138 %
Assam	12,269	13,153	15,687	18,598	21,991	23,993	+95 %
Manipur	13,260	12,970	14,728	17,772	19,780	21,062	+58.8 %
Meghalaya	14,355	17,241	19,702	23,355	29,811	33,674	+134 %
Mizoram	16,443	19,430	21,963	24,029	27,501	29,576	+80 %
Nagaland	13,819	18,961	19,806	20,255	–	–	–
Sikkim	14,890	17,324	21,476	26,628	33,349	37,553	+152 %
Tripura	14,119	18,368	21,138	25,700	28,806	–	+104 % (till 2007–2008)

Sources:
1. Economic Survey of Assam, 2006–2007, Government of Assam
2. Estimates of State Domestic Product of Meghalaya, Government of Meghalaya
3. North-East Development Finance Corporation: http://databank.nedfi.com/content/north-east-India, accessed on 05-02-2011

19.2.1 Per Capita Domestic Product of North-Eastern States

The per capita annual income expressed in terms of NSDP (Net State Domestic Product) in the North-Eastern region is slightly lower than the national average (Table 19.2). As against a per capita annual income of Rs. 37,490 (2008–2009) for the country as a whole, the states of the North-Eastern region, with the exception of Sikkim, show a per capita income that ranges from 64 % for Assam to around 90 % for Meghalaya, of the national average. Sikkim is the only state that has grown at a rate parallel to the country as a whole. Even at 1999–2000 constant prices, the per capita income of the states of the North-East is less than the average for the country as a whole.

Whichever way one looks, the states of the North-East have a lower per capita income ranging from INR 16,272 (2008–2009) for Assam, the lowest, to INR 25,257 for Sikkim, the highest for the region: reaching the national average. Tripura and Meghalaya are growing at a moderate rate, and Manipur and Assam have to grow at a more rapid pace to come to the national level.

Table 19.2 does not imply that the North-Eastern states are the poorest in the country. There are states like Bihar, Uttar Pradesh, Jharkhand, Madhya Pradesh and Chhattisgarh occupying India's heartland, unlike the peripheral location of the North-East; yet, they have a lower per capita income than even Assam. If one leaves out seven union Territories including Delhi and Chandigarh, both of which have a per capita income of more than two and half to three times that of national average, and take the remaining 28 states, the North-Eastern states occupy ranks that range from 11th for Sikkim to 24th for Manipur (Table 19.3).

Thus, if one plots the 28 states of India according to their rank, in terms of per capita income, dividing them into four quartiles, starting from lowest to the highest income group, there would be two states of the North-East falling in the lowest quartile, four in the second and two in the third quartile. The third quartile states, Sikkim and Tripura, are better developed states, while Assam and Manipur falling in the lowest quartile are least developed. The North-East is certainly not the poorest region of India, and well endowed with the resources, it has the potential to forge ahead in the race for economic development

19.2.2 The Growth Rate of the Economy in the North-Eastern Region

Till the 1990s of the last century, Indian economy grew rather slowly at a rate of approximately 4 % per annum. Following the adoption of a liberalised policy, giving greater scope for the expansion of private sector in the country, and the withdrawal of certain restrictive practices, ironically called 'Permit Raj', the economy began to grow at a rate of 9 % per year. The policy of liberalisation

Table 19.2 Per capita income (Net State Domestic Product) at constant prices 1999–2000 in rupees (INR)

Year	India per capita Net National Product	Net State Domestic Product							
		Arunachal	Assam	Manipur	Meghalaya	Mizoram	Nagaland	Sikkim	Tripura
1999–2000	15,881	13,990	12,282	13,260	14,355	16,443	13,819	14,890	14,119
2000–2001	16,171 + 1.8	14,726 + 5.26	12,447 + 1.34	12,157 − 8.32	14,910 + 3.86	16,635 + 1.17	15,746 + 11.29	15,305 + 2.79	14,933 + 5.77
2001–2002	16,769 + 3.7	16,793 + 14.03	12,529 + 0.61	12,641 + 3.98	15,518 + 4.08	17,245 + 3.67	16,540 + 5.97	15,953 + 4.23	16,947 + 13.5
2002–2003	17,109 + 2.02	15,832 − 5.72	13,072 + 4.33	12,319 − 2.55	15,882 + 2.35	18,429 + 6.87	17,469 + 4.64	17,065 + 6.97	17,752 + 4.75
2003–2004	18,301 + 6.96	17,340 + 9.52	13,675 + 4.61	13,389 + 8.69	16,658 + 4.89	18,555 + 0.68	17,319 − 0.52	18,159 + 6.41	18,554 + 4.52
2004–2005	19,331 + 5.62	19,339 + 11.53	13,946 + 1.98	14,334 + 7.06	17,595 + 5.62	18,904 + 1.88	17,269 − 0.29	19,332 + 6.46	19,825 + 6.85
2005–2006	20,868 + 7.95	18,179 − 6.00	14,419 + 3.38	14,663 + 2.3	18,870 + 7.25	18,616 − 1.52	17,008 − 1.51	20,777 + 7.47	21,524 + 8.57
2006–2007	22,580 + 8.2	20,458 + 12.54	14,894 + 3.29	14,941 + 1.9	20,185 + 6.97	19,220 + 3.24	17,129 + 0.71	22,227 + 7.22	21,705 + 0.85
2007–2008	24,295 + 7.6	21.582 + 5.49	15,526 + 4.24	15,667 + 4.86	21,597 + 7.00	19,750 + 2,76	NA	23,684 + 6.32	22,453 + 3.63
2008–2009	25,494 + 4.93	22,475 + 4.14	16,272 + 4.8	16,508 + 5.37	23,069 + 6.82	20,483 + 3.71	NA	25,257 + 6.64	NA

Source: For India: National Accounts Division, Central Statistical Organisation. For States: Central Statistical Organisation as on 12-4-2010, taken from North-East Development Finance Corporation (NEDFi) Data Bank for each North Eastern State

Table 19.3 Ranking of the per capita Net State Domestic Product of some Indian states

States	Per capita Net State Domestic Product (2007–2008) (Rs.)	Rank in terms of per capita income at current prices (2007–2008)
Goa	105,582	1
Haryana	58,593	2
Maharashtra	47,051	3
Gujarat	45,773	4
Sikkim	33,349	11
Tripura	28,806	14
Mizoram	27,501	15
Arunachal Pradesh	27,398	16
Meghalaya	26,636	17
Nagaland	–	18
Orissa	23,403	22
Assam	21,464	23
Jharkhand	19,928	24
Manipur	19,780	25
Madhya Pradesh	18,051	26
Uttar Pradesh	16,060	27
Bihar	11,135	28

Source: Directorate of Economics & Statistics of respective State Governments

benefitted the North-East region as much as the rest of India. In fact, the North-Eastern region enjoyed some added advantage by way of certain incentives, like tax exemption or reduction, to private operators. The North-East also grew with the rest of India, partly as a result of special attention paid by the Central Government through several development schemes, especially those related to infrastructure, but no less because of the impact of changed economic and industrial policy. Setting of additional refineries, development of several power projects, establishment of several factories in public as well as private sector and the setting up of several technical institutions are a part of the initiative aimed at promoting development of the region.

Most states have grown, if one takes current prices, almost at the same rate as the country as a whole. To take an instance, Assam has shown a consistent growth of over 10 %, at current prices of each year, but this is not so if one takes constant prices at 1999–2000 prices (Table 19.4). It is likely that the price situation in Assam was not so bad in the succeeding years after 1999–2000. The ratio between the two rates of growth of current and constant prices depends on the price fluctuations. A higher inflationary surge may show an apparent growth at current prices, but when weighted against constant price of an earlier period, the growth rate comes down. The less the inflation, the more is the convergence between two rates of growth. Among the states of the North-East, Nagaland, more than any other state, needs an accelerated growth.

Table 19.4 Growth in the Gross State Domestic Products at currents as well as constant (1999–2000) prices for the years 1999–2000 to 2008–2009

		Percentage growth over previous year									
		Years									
India/states		1999–2000	2000–2001	2001–2002	2002–2003	2003–2004	2004–2005	2005–2006	2006–2007	2007–2008	2008–2009
India	(A)	–	5.08	6.5	6.2	10.5	11.1	12.1	13.5	12.7	12.6
	(B)	–	1.80	3.70	2.02	6.96	5.62	7.95	8.2	7.6	4.97
Arunachal	(A)	–	10.86	17.74	–1.57	14.34	20.98	2.48	16.96	13.92	16.62
	(B)	–	7.07	15.70	–4.31	10.94	16.96	–4.25	13.75	6.36	5.87
Assam	(A)	–	5.69	4.07	13.30	8.98	11.05	10.96	11.44	11.17	10.68
	(B)	–	2.53	2.60	7.07	6.02	3.74	4.94	4.9	5.73	6.17
Manipur	(A)	–	–4.74	7.11	4.25	13.43	13.86	10.33	6.92	8.23	8.53
	(B)	–	–6.40	6.22	0.54	10.92	9.26	4.35	3.93	6.90	7.41
Meghalaya	(A)	–	10.70	13.05	6.36	10.88	9.95	11.02	13.73	15.58	13.44
	(B)	–	5.45	6.89	3.79	6.78	7.11	8.04	6.48	8.41	8.17
Mizoram	(A)	–	11.13	11.81	10.33	7.76	4.70	9.95	9.63	9.81	10.29
	(B)	–	3.76	6.29	9.65	3.23	4.49	1.03	5.87	5.39	6.37
Nagaland	(A)	–	15.21	11.22	7.39	2.02	1.65	0.61	3.14	NA	NA
	(B)	–	11.29	5.97	4.64	0.52	0.29	–1.51	0.71	NA	NA
Tripura	(A)	–	13.20	14.92	3.76	10.91	8.03	12.54	8.23	3.56	NA
	(B)	–	5.77	13.49	4.75	4.52	6.85	8.57	0.65	3.63	NA

Source: For India: National Accounts Division, Central Statistical Organisation. For States: Central Statistical Organisation as on 12-4-2010, taken from North-East Development Finance Corporation (NEDFi) Data Bank for each North Eastern State

Note: *A* Growth at current prices, *B* Growth at constant prices (1999–2000)

19.2.3 Income Distribution and Poverty Level

An important aspect of the income of the states is the distribution of income. A higher mean individual income is no insurance against individual poverty. States with large urban production centres, such as Maharashtra, Karnataka and Tamil Nadu, though with a higher per capita income, have a large population below poverty line. The figures obtained for the year 2004–2005, from the Planning Commission India, and published by the Ministry of Health and Family welfare, in the '*National Health Profile*', give a proportion of population below poverty line, for different states of India. Surprisingly some of the so-called richer states have a much higher proportion of population below poverty line than many of the states of the North-East. The definition of 'poverty and poverty level' is a complex issue. For our purpose, the definition and the poverty level, defined by the Planning Commission of Government of India, have been adopted (Table 19.5).

It may appear paradoxical; yet the poverty level in the North-Eastern Indian states is not only lower than the all India level, but is even below some of the more prosperous states of the country like Maharashtra. The average percentage of

Table 19.5 A comparison of proportion of population below poverty line in different states of India 2004–2005 (latest)

	Percentage of population below poverty line		
India/states	Rural	Urban	Combined
India	28.3	25.7	27.5
Arunachal Pradesh	22.3	3.3	17.6
Assam	22.3	3.3	19.6
Manipur	22.3	3.3	17.3
Meghalaya	22.3	3.3	18.5
Mizoram	22.3	3.3	12.5
Nagaland	22.3	3.3	19.0
Sikkim	22.3	3.3	20.1
Tripura	22.3	3.3	18.9
Andhra Pradesh	11.2	28.0	15.8
Bihar	42.1	34.6	41.4
Chhattisgarh	40.8	41.2	40.9
Gujarat	13.6	15.1	14.0
Jharkhand	46.3	20.2	40.0
Karnataka	22.8	32.2	25.0
Maharashtra	29.6	32.2	30.7
Madhya Pradesh	36.9	42.1	38.3
Orissa	46.8	44.3	46.4

Sources:
1. Planning Commission of India quoted from National Health Profile 2009, p. 32, Ministry of Health and Child Development
2. Poverty ratio for Assam is used for Arunachal Pradesh, Meghalaya, Mizoram, Manipur, Nagaland, Sikkim and Tripura in the National Health Profile
3. The poverty ratio of all India level is obtained as the weighted average of the state wise poverty ratio

population below poverty line in India is 27.5 %.[1] In contrast, all the states in the North-East have a much lower ratio of population below poverty level, the lowest being that of Mizoram where only 12.5 % people live below the poverty line.

There are two significant facts emerging from Table 19.5. The first is a very highly skewed distribution of income in some of the richer states like Maharashtra and Karnataka, where a large section of the peasantry still remains poor. The second, and a more striking fact, is the prevalence of urban poverty in these large, so-called developed states. In contrast, the states of the North-East have a lower level of poverty despite their lower per capita income, an obvious pointer to the fact that there is a better distribution of income and the inequality is far less in these states. There is, no doubt, some urban poverty in Assam and Arunachal Pradesh, but the ugly sight of poverty that one encounters in the slums of large metros, like Mumbai and Delhi, is happily missing in these states. A lower density of population and a

[1] This ratio is under revision following a recent report by Tendulkar Committee (2009), which fixes the poverty line at a higher income.

virtual absence of space restriction have enabled a slum-free urban growth in the North-East region.

Contrasting with the situation of the poorest states of India, like Chhattisgarh, Bihar, Jharkhand and Orissa, with a ratio of population living below poverty line ranging from 46 % in Orissa to 42 % in Bihar, 41 % in Chhattisgarh and 40 % in Jharkhand, Assam and other states in the North-East have a moderate level of poverty. The contrast between the glittering CBDs and depressing sight and stark poverty of the *jhuggis* (temporary often unauthorised insanitary shelters) in one and the same city, as witnessed in large cities of western India, is not encountered in the states of the North-East.

19.2.4 Generation of Income from Different Sectors of the Economy

There is no uniform pattern about the contribution of different sectors of economy to the state's GDP. In most cases, however, services contribute half the income of the state. The other half is shared by agriculture and other allied activities and industry (Table 19.6).

Services include transport by road, railways or other means, storage, communication, trade, hotels and restaurants, banking and insurance, real estate, business services, public administration and other services The present situation, however, is far removed from the situation as it existed about three decades earlier, in 1975–1976. For the North-Eastern region, as a whole, the share in the GDP of different sectors of the economy (2008–2009), i.e. primary, secondary and services, as seen in Table 19.6, is 26.4, 24.2 and 49.4 %, respectively.

The contribution of the different sectors, to the economy of the states, depends on the growth in a specific sector. In most states, the share of agriculture has declined despite the growth in agricultural production, as a result of the faster growth of industries and services. Assam, the state contributing two-thirds of the combined GDP of all the eight states of the North-East region, shows a completely different picture of the contribution of different sectors of the economy in 2008–2009, when compared with the situation three decades earlier. The contribution of the primary, secondary and tertiary sector to the economy of the states in two different years and at an interval of over three decades is as follows (Table 19.7):

Similar changes have occurred in other states as well. The general trend is a decline in the contribution of agriculture and a corresponding increase in the share of industries and services. Some of the states like Nagaland have shown a remarkable progress in their agriculture, but not much progress is seen in industrial growth. A relatively high share of industries in Arunachal Pradesh is the result of a few forest-based industries in Tirap district and growth in service sector largely attributed to tourism. In most states, services have around 50 % share in their economy, but disturbed conditions in states like Manipur have stifled the growth of service sector, particularly transport and tourism. Most of the states,

Table 19.6 Total gross domestic product at current prices and share of different sectors of the economy (in INR ,00,000)

States		Agriculture (1)	Agriculture and c. allied sector (2)	Industry (3) d.	Services (4)	Total (2+3+4)
Arunachal (2007–2008)	(a)	91,425	101,334	136,149	151,342	388,825
	(b)	23.5	26.06	35.01	38.92	99.99
Assam (2008–2009)	(a)	1,974,794	2,214,606	1,806,091	3,906,969	7,927,666
	(b)	24.9	27.9	22.78	49.2	99.88
Manipur (2007–2008)	(a)	125,316	145,647	195,714	243,428	584,789
	(b)	21.43	24.9	33.46	41.62	99.97
Meghalaya (2007–2008)	(a)	152,530	166,269	262,953	417,938	847,160
	(b)	8.0	19.62	31.03	49.33	99.96
Mizoram (2008–2009)	(a)	44,892	50,961	76,309	238,993	366,263
	(b)	12.7	13.91	20.83	65.25	99.99
Nagaland (2005–2006)	(a)	165,676	184,589	81,358	283,100	549,047
	(b)	30.17	33.6	14.8	51.56	99.99
Sikkim (2007–2008)	(a)	39,067	40,942	75,723	113,121	229,786
	(b)	17.0	17.8	32.95	49.22	99.97
Tripura (2006–2007)	(a)	197,731	224,058	232,649	497,921	954,628
	(b)	20.7	23.49	24.3	52.15	99.94
Total of all states	(a)	2,791,431	3,128,406	2,866,946	5,852,12	11,841,164
	(b)	23.57	26.4	24.2	49.4	100.00
India (2008–2009)	(a) NDP	8,28,137 crores	935,348 crores	1,089,090 crores	2,628,983 crores	4,653,421 crores
	(b)	17.79	20.1	23.4	56.5	100.00

(a) Gross Domestic Product in ,00,000
(b) Percentage share of a specific sector of economy
(c) Agriculture and allied sector includes agriculture, forestry and logging and fishing
(d) Secondary sector includes, manufacturing, both registered and unregistered, mining and quarrying, construction, electricity, gas and water supply

Table 19.7 Change in the percentage share of different sectors (primary, secondary and tertiary) of economy in the net domestic product of Assam from 1975–1976 to 2008–2009

	Share of the sector in the NDP of the Assam in percentage	
Sector of economy	1975–1976	2008–2009
Agriculture including fishing and forestry	60	27.9
Industries including mining and construction	20	22.78
Services	20	49.2

Sources:
Economic Survey of Assam 1975–1976, p. 9, Government of Assam
For 2008–2009, NER Data Bank, from NE Development Finance Corporation, taken From Central Statistical Organisation, Government of India

Table 19.8 Growth trend in net domestic product of different states (rupees-INR)

States	NDP 1999–2000 in ,00,000	NDP 2006–2007 in ,00,000	Growth during 1999–2000 and 2006–2007 in %
Arunachal Pradesh	149,696	257,255	+71.85
Assam	3,201,066	4,303,802	+34.4
Manipur	295,411	383,870	+30.0
Meghalaya	321,130	543,822	+69.34
Mizoram	140,951	196,712	+39.6
Nagaland	260,980	449,200	+72.1
Tripura	449,557	744,942	+65.0

Source: North-East Development Finance Corporation (NEDFi) Data Bank for each North Eastern State. Accessed on 05/02/2011

with the exception of Meghalaya, still depend heavily on agriculture, as it is vital to meet the food requirement of the people. In case of Tripura, there has been an expansion in the growth of agriculture as well as industries, whereas in case of Meghalaya, the increase is largely in industrial activities. In Meghalaya, while the income from agriculture and allied activities has grown 2.27 times, that from industries has almost quadrupled. Between 1999/2000 and 2008/2009, manufacturing, though accounting for a modest 6 % of the state's income, has increased tenfold.

19.2.5 The Growth Momentum

The growth momentum of the North-Eastern region as seen between 1999–2000 and 2006–2007 divides the region into two groups: the states that have grown around 70 % during the period of 7 years and those which have not made such progress (Table 19.8). Among the states, Manipur is growing at a snail's pace. Assam has the advantage of a relatively large size of its economy, and in a situation of sudden financial crisis or natural disaster, it can absorb part of the shock by

Table 19.9 Growth in per capita Net State Domestic Product at constant (1999–2000) prices. (Actual income in Rs. and growth in percentages)

		Years			
India/states		1999–2000	2006–2007	2007–2008	2008–2009
India	(a)	15,881	22,580	24,295	25,494
	(b)	–	42.2	53.0	60.5
Arunachal	(a)	13,990	20,458	21,582	–
	(b)	–	46.2	54.2	–
Assam	(a)	12,282	14,894	15,528	16,272
	(b)	–	21.3	26.0	32.5
Manipur	(a)	13,260	14,941	15,667	16,508
	(b)	–	12.6	18.2	24.5
Meghalaya	(a)	14,355	20,185	21,597	21,069
	(b)	–	40.6	50.4	46.8
Mizoram	(a)	16,443	19,220	19,750	20,483
	(b)	–	16.9	20.11	24.6
Nagaland	(a)	13,815	17,129	NA	NA
	(b)	–	39.5	–	–
Tripura	(a)	14,119	21,706	22,493	–
	(b)	–	53.7	62.7	–

Source: North-East Development Finance Corporation (NEDFi) Data Bank for each North Eastern State. Accessed on 05/02/2011

(a) Per capita Net State Domestic Product at constant (1999–2000) prices

(b) Growth in percent over 1999–2000 production

readjusting its finances and distribution system. Smaller states, on the other hand, suffer immeasurably under the impact of any natural disaster, disturbance in the society or a financial crisis caused by crop failure or similar other reasons. Being small, they have little scope to distribute the losses.

The growth is considerably moderated, when weighted against population to give per capita Net State Domestic Product at constant (1999–2000). Some of the states like Nagaland have shown a decadal growth of about 65 %, fast multiplying from 1.2 million in 1991 to almost two million in 2001. This unprecedented increase in population, either because of under-enumeration in 1991 or over-enumeration in 2001, is not matched by a parallel growth in economy, showing an increase of less than 40 % in per capita income between 1991 and 2006, in stark contrast to an overall growth in economy measured in terms of Net State Domestic Product.

None of the states has shown a per capita net domestic product, comparable to the average for India (Table 19.9), nor has the economic growth pattern of the North-Eastern states been able to keep pace with the growth of Indian economy, during the decade 1999–2009. Assam, the largest state, starting from a low base in 1999–2000, has shown a recovery and has a reasonable growth rate. In terms of economic growth, Tripura is better placed than the other states in its growth.

Table 19.10 Some details of land utilisation, agricultural population density and yield of rice in the North-Eastern States

State	Net sown area (in 000 ha)	Net sown area as % of total geographical area	Net sown area (ha) per 100 population	Yield of rice kg/ha	Food grain production in ,000 tons (2008–2009)	Food availability gm/person/day 2011 population
Arunachal	166	1.98	15.1	1,295	255.8	506.8
Assam	2,701	34.43	10.13	1,652	4143.0	364.16
Manipur	140	6.27	6.46	2,363	415.0	417.7
Meghalaya	240	10.70	10.35	1,887	236.3	218.4
Mizoram	91	4.12	10.24	1,926	133.8	336
Nagaland	261	15.74	13.1	1,993	514.2	711
Sikkim	96	13.52	17.7	1,476	107.5	484.6
Tripura	277	26.40	8.6	2,590	634.7	473.6
NE region	3,972	15.0	10.2	–	6365.4	382.5
India	140,300	43.5	13.9	2,200	230,775	522.4

Sources:
For net Sown Area – Basic Statistics of NER (2006) op.cit
For yield of rice and food production (2008–2009) NEDFi NER Data Bank @ http://databank.nedfi.com/content/foodgrains, accessed on 5/2/2011
Notes:
1. The production of yield of crops in Mizoram is highly variable, because agriculture is essentially shifting cultivation. Here the production is taken for the year 2003–2004, the year of maximum production
2. The figures of population utilised to calculate the availability of food grains represent the provisional population figures for 2011, released by the Census of India

19.2.6 Resource Utilisation by the North-Eastern States

The most important resource of the region is the cultivable land followed by water and forest. The pressure on land and its effective utilisation can be measured by the availability of cultivable area expressed by the ratio of net sown area (NSA) to the total area of the state, expressed in percentage, and the yield of crops, particularly rice (Table 19.10).

Whichever way one looks, either in terms of percentage of net sown area (NSA) per 100 population or in terms of the yield of rice, the principal crop of the region, the states of the North-East stand generally below the national average. In terms of yield, Tripura and Manipur are the only states, which not only compete but show a yield above the national average. But if availability of food is taken as a criterion, no state of the North-East region reaches the national average. Ironically, Arunachal Pradesh, the state with the lowest density of population, has the highest per capita availability of food grains. Meghalaya and Mizoram represent the worst-case scenario in the production of food grains and woefully lag behind in increasing their agricultural productivity. The region as a whole needs to upgrade its agricultural productivity.

Food sufficiency and food security are a significant measure of the welfare of a region. Certainly, in modern times, a deficiency in food production can be

Table 19.11 Employment in the organised sector in different states of North-East India

India/states	Employment in public and private sector as on 31-3-07 in million	Total population of India/states in 2011 (million)	Percentage of people employed in organised sector
India	27.276	1210.193	2.65
Arunachal Pradesh	NA	1.382	NA
Assam	1.12	31.169	3.59
Manipur	0.079	2.72	2.9
Meghalaya	0.082	2.96	2.77
Mizoram	0.042	1.09	3.85
Nagaland	0.076	1.99	3.8
Tripura	0.145	3.67	3.95

Source: Directorate General of Employment and Training, Ministry of Labour and Employment, Government of India

compensated by a high level of income from industries or services that can ensure import of food from other regions. This is partly so in case of the North-Eastern region where there has been considerable economic growth, as in the rest of the country during the last two decades. During the last decade (2001–2011), the population of the region has grown by about 18 %, and though the growth in agriculture has been slow, the growth in other sectors of the economy has saved the situation from being catastrophic. The states receive their food supply, as required, either through the trade channel or through the Food Corporation of India. The procurement of food from nondomestic sources emphasises the urgency to push agricultural growth.

19.2.7 Employment

On the basis of the figures of employment in organised sector, one can compare the states of the North-Eastern region with the rest of India. These figures are obtained from the Directorate of Employment and Training, Ministry of Labour and Employment, Govt. of India (Table 19.11).

In terms of employment in organised sector, most states in the North-East are above the national average. Assam, for example, employs over 3.6 % of its population in organised sector against the national average of 2.65 %. Even in absolute terms, the employment in organised sector in Assam (1.12 million) is much above highly populated states in Bihar, Chhattisgarh, Madhya Pradesh, Punjab, Haryana, Himachal Pradesh and several other states. And this employment is almost evenly developed between public and private sector. Over 500,000 people are, each, employed in the public and private sector in Assam. Most other states of the North-East have over 3 % of the population engaged in the organised sector.

The most significant fact about employment is that most of the employees, though working in the formal and organised enterprises, work in the public sector; in other words they are in government jobs (Table 19.12).

Table 19.12 Percentage of organised employment in private and public sector

India/states	Public sector	Private sector
India	65.9	34.1
Arunachal Pradesh	46.4	53.6
Assam	96.2	3.8
Manipur	89	11.0
Meghalaya	95.2	4.8
Mizoram	93.4	6.6
Nagaland	NA	NA
Tripura	NA	NA

Source: Directorate General of Employment and Training, Ministry of Labour and Employment, Government of India

As can be seen, organised sector employment in the North-Eastern states ranges between 2.9 % for Manipur and 3.95 % for Tripura, of the total population. This stands in sharp contrast to 2.65 % of the population of India employed in the organised sector. More specifically, much of the employment in the organised sector in the North-East is in public sector. In fact, with the exception of Arunachal Pradesh, all the other states of the North-East region depend almost exclusively on public sector for employment. In other words, there is very limited presence of private enterprises in the region. In most states, over 90 % of the employment in formal enterprises comes under public sector. This shows a dearth of private enterprise. Assam is better placed with several industries, both large and small, yet the employment in public sector far outstrips the number employed in private enterprises. While the entire region requires a boost in industrial development, the absence of corporate and private entrepreneurs is not a happy situation. To reverse the trend and encourage private enterprise in the region requires a change in the policy of the State as well as the Central Government that would guarantee a minimum security to the industrial establishments, besides offering them some tax incentives.

19.3 Human Welfare in the North-East

Besides the economic situation of the North-Eastern states of India, discussed earlier, there are other aspects of life, like health, nutrition, longevity and education, besides several other attributes of human existence, that define the level of well-being of a society.

19.3.1 Social Welfare as Seen through Human Development Reports of the States

Ever since the first publication of the Human Development Report by the United Nations Organisation in 1990, and its continuance as annual Human Development Report, it has become almost a tradition with the Government of India and even with

the states to publish their own Human Development Reports (HDRs). The states of North-East have also published HDRs, following the pattern and style of the National Human Development Report published in 2002. The Government of Assam published its HDR in 2003, while the Governments of Nagaland, Arunachal Pradesh and Tripura published their Human Developments Reports in 2002, 2006 and 2007, respectively. The Government of Meghalaya brought out a beautifully designed HDR in 2008. On the basis of these Development Reports, Nayak (2009) compiled a paper titled *Human Development Reports of North-East India*: *A Bird's Eye View*, placed at Munich Personal Pe PEc Archive. Nayak has reviewed, in brief, the published reports of the states and concluded that 'the achievement of north-eastern region is quite reasonable in comparison to all India average situation in respect to human development indicators, for both sexes, but it has failed to bring commensurate growth'.

The Planning Commission of India, like other international agencies, has quantified Human Development by devising a Human Development Index based on a number of variables. The most common of these variables are infant mortality, life expectancy at birth, literacy, enrolment ratio, availability of medical facilities, gender equality and several others, besides the per capita income. Instead of comparing the indices, the actual figures of some of the vital attributes are given in Table 19.13. This will give an idea of the state of human welfare in the North-East region of India.

In some of these aspects, like literacy or Gross Primary Enrolment Ratio, that form a measure of social welfare, North-East region is fairly well placed. The states of Arunachal and Assam, however, show a level of literacy below the national average, but both are well on the way to show a much improved level of literacy. Infant mortality is relatively higher in Assam and Meghalaya. It is difficult to explain this phenomenon, more so, in case of Meghalaya. Water logging during rainy season, forested hilly tribal tracts, unhygienic conditions and poor accessibility to the medical centres or a maternity home may be responsible for this high rate of infant mortality. Assam and Meghalaya are the states where infant mortality is one of the highest. Assam shows the fourth highest infant mortality in India, after Madhya Pradesh, Orissa and Uttar Pradesh. This is a sad reflection on the management of health services in Assam. Meghalaya, with an infant mortality ratio of 58 per 1,000 live births, is not much better. It lags behind almost all the North-Eastern states. A very low infant mortality in the rest of the North-Eastern states, Manipur 21, Nagaland 21, Mizoram 23, and Tripura 39, evokes admiration. These states, though located in distant peripheral areas, have managed their health care and pre- and postnatal health care efficiently. In several other aspects of health care, the peripheral states are better placed than Assam, the principal state of the North-Eastern region.

19.3.2 Cultural Profile: An Indicator of Welfarism in the North-East

With an age-old tradition of folklore, music, art and handicraft, North-East has a rich cultural diversity, with each state proud of its own culture. Assam, no doubt, stands as the *avant-garde* for the entire region, in art, culture and literature, and

Table 19.13 India and North-Eastern states: A comparison of some Human Social Welfare Indicators

Indicators of social welfare	India	Arunachal	Assam	Manipur	Meghalaya	Mizoram	Nagaland	Tripura
1. Literacy (%) (2001)	64.8	54.3	63.3	70.5	62.6	88.8	66.6	73.2
(2011)	74.04	66.95	73.18	79.85	75.48	91.58	80.11	87.75
2. Gross primary enrolment ratio	111.2	136.6	9.4	163.6	181.8	158.9	90.2	142.9
3. Infant mortality	53	32	64	14	58	37	26	34
4 Life expectancy at birth	61.8	NA	57.8	–	–	–	–	–
5. Average population per hospital bed	2,105	533	3,911	1,067	991	783	1,022	1,561
6. Percentage of villages with safe drinking water (2001)	55.54	66.87	43.28	33.72	26.82	12.89	55.6	30.6
7. Percentage of households having electricity connection (2001)	43.53	44.53	16.54	52.5	30.66	90.33	56.88	31.75
8. Percentage of households having bathroom facility (rural)	–	10.27	6.73	6.27	18.61	18.4	25.7	3.2
9. Percentage of toilet availability within the house (rural)	–	18.58	40.11	49.8	23.4	34.6	37.8	53.8

1. Gross Primary Enrolment is the ratio expressed in percentage of total enrolment in Primary schools of all children in the age group 6–11 years
2. Infant mortality is related to per thousand live births
3. Data source: National Health Profile, Ministry of Health Government of India

radiates waves of cultural diffusion to other states. Besides Assam, Manipur and Tripura, the erstwhile princely states take pride in their own cultural and literary tradition. More than any other state, Manipur claims a heritage dating back to the second century of the Christian era. Some other states, like Meghalaya, have committed to writing their own oral literature of considerable antiquity and revel in the beauty and appeal of their own literature.

The humanity in the region has, over the centuries developed its own art, culture and literature, often a blend of the indigenous art, and the art and culture of the later immigrants. The ancient ruins in Brahmaputra valley like the ones of Bamuni Pahar in the vicinity of Tezpur, dating back to sixth to eleventh century, speak of the royal glory of the pre-Ahom days. The intricate design seen on silk weaving is unparalleled and represents the traditional craft of Assam. The *Bihu geet*s, the pastoral ballads of Assam, present a genre of music, dance and a kind of chorography that is unique in style and touching in their appeal. The Assamese language, referred to as the uterine sister of Bengali, with its pre- and post-Vaisnavite variants and modern Assamese literature has its own pride of place in Indian literature. To a person not familiar with Assamese literature, it comes as a surprise that the first-century epic 'Ramayan' authored by Valmiki was translated in Assamese by Madhab Kandali also known as Kaviraj Kandali, who enjoyed the patronage of the Kachari kings, much before Hindi poet Tulsidas wrote 'Ramcharitmanas', following the Ramayana text. As far as devotional literature is concerned, there is no parallel to Sankardeb (1449–1569) and his followers. His *bargeets*, composed four centuries ago, still carry an undiminished appeal to devout Vaisnavites. Sankardeb and his associates devoted their life to developing an institutional order known as *satras*, and there are over a thousand of them in Assam – and a literature that included translations, poetry, drama and songs – all meant to promote the Vaisnavite cult of Hinduism. The modern Assamese literature, deriving its inspiration from the modern European literature, is as progressive as any of the regional language literature. Proud of their history and culture, and justifiably so, the Assamese are equally proud of their contribution to India's struggle for independence and aptly quote the sacrifices made by the likes of Mani Ram Diwan, the freedom fighter during 1857 war of independence, and Anandaram Dhekial Phukan, who successfully fought for the replacement of Bengali by Assamese, as the medium of instruction in Assam. The sociocultural achievements of Assamese society are a perpetual inspiration to the people. The pride in their art, literature and culture sustains the Assamese society even in adverse socio-political situation. The past, one should not forget, is as much a source of strength and emotional welfare, as the material prosperity and physical welfare.

The sad and unfortunate part is that despite being so enlightened, the Assamese society appears simmering with discontent, directed primarily toward the Government of India. The resentment is born out of a perception that the Central Government is indifferent to the North-East and lacks seriousness in resolving any of its problems. The illegal immigration of Bangladeshi peasants in Assam is the most serious problem about which every Assamese is concerned. There is not only a widespread perception but even belief that the Indian National Congress, the party that has

governed the country for a major period after independence, has been conniving at the continuing infiltration of Muslim peasants from Bangladesh in Assam, a phenomenon that has helped them in getting elected to the state legislature, as well as returning a majority of Congress candidates as members of the Indian Parliament.

This is the principal cause of disenchantment with the Central Government. A number of additional grievances have, over the decades, piled up. These include intentional neglect of the state, the exploitation of the State's resources by outsiders and multinational companies and disproportionately small share of employment in industrial enterprises and Central Government services. Some of these grievances are genuine and some may be the result of a lingering prejudice.

The situation becomes more complex without improving because of a number of contending political parties. Instead of putting their heads and mite together to work in the interest of the region, they often work at cross-purpose. Even a good initiative to improve things attracts criticism of another party, which has some following, creating confusion in the process.

19.3.3 The Impact of Immigration from East Pakistan/Bangladesh

Though the immigration of peasants invariably in search of un-reclaimed land started during British India, its intensity increased after the partition of the country. Excessive pressure of population in Bengal forced the Muslim peasants to migrate to Brahmaputra valley in Assam with much lower population density. What was once a legal, and often induced immigration, turned into an illegal infiltration. An increasing presence of Bengali-speaking Muslim farmers began to bring the indigenous Assamese peasants face to face with the immigrants. The local peasantry felt threatened, and a situation of conflict developed which occasionally degenerated into ugly violence.

The discontent of the Assamese middle class and peasantry is, as often believed, not the result of any recent, more specifically post-1971 infiltration of Bangladeshis, but has a long history and is the cumulative effect of a sequence of events starting from the imposition of Bengali as a medium of instruction in Assamese schools in the mid-nineteenth century that lasted from 1836 to 1872. Assamese regained its rightful place as a language of the state and as a medium of instruction in schools in 1872, following the efforts made by Anandaram Dhekial Phukan (1829–1859) and supported by American missionaries. As if the wrongful introduction of Bengali as a medium of instruction was not enough, a large number of educated Bengalis were recruited by the British, to assist them in the administration of the state in the early stages of their occupation. Bengali clerks, doctors and lawyers with the advantage of their early initiation in English education and familiarity with the British-Indian administrative system monopolised government jobs (Baruah 1986:323). The resentment against the recruitment of officials was palpable. This resentment against recruitment of officials was described by Hem Barua (1965) in resentful and

uncomplimentary terms when he wrote, 'Like the Cossacks filling the Czarist army, men from Bengal filled the offices in Assam during British rule. (and) In 1836, Assamese was completely jockeyed out of existence; it was deprived of its legitimate place in the courts of administration and educational institutions'.

The opening of tea gardens by European Company with all concessions, granted officially by the colonial government, brought forth a new reality in which the tea gardens and tea planters became all too important in the economic landscape of Assam. The discovery of oil, and its interests controlled by colonial masters, was another aspect that pointed to an exploited economy. Even today, the resentment persists as Misra (1980) remarked: 'The state rich in natural resources has been progressively sucked dry of its wealth. Despite being the country's largest producer of tea, oil, plywood and forest products, Assam is one of the poorest and industrially most backward states of India'. The statement may not be literally correct, but its meaning and implications are clear, suggesting that the state did not have its share in development.

Another recurrent phenomenon of Assamese resentment is the continued immigration of Bengali peasants, unhindered until the partition of the country in 1947, and illegal infiltration after part of Bengal became Pakistan's eastern wing. What has irked the people of Assam is the indifference of the Central Government to check this infiltration. There is general impression among the Assamese that persists even today that the Central Government, especially the government formed by Indian National Congress, has been conniving at this infiltration. It is believed that the immigrant Muslim population supports Congress party at the hustings.

All this resentment led to students' movements, new political parties and emergence of insurgent groups challenging the Central Government and even demanding secession of Assam from India as a sovereign state. This led to violent clashes between the local and immigrant communities resulting in death and destruction. At the height of the movement of the 1980s of the last century, Amalendu Guha (1980), an economic historian, wrote his commentary on the movement under the title *Little Nationalism turned Chauvinist*, *Assam's Anti-foreigner Upsurge*. This provoked a debate among the educated Assamese, who wrote rebuttals and rejoinders to deny the charge of chauvinism.[2]

The entire debate in the wake of the violence that erupted in Assam following the demand for detection and deportation of illegal immigrants was initiated by Amalendu Guha, first in 1978 when he discussed the interrelations between the immigrants and autochthones in Brahmaputra valley. At the height of the movement when attacks on non-Assamese became frequent, Guha came out with his

[2] Guha (1980).

1. Gohain (1980a).
2. Omvedt (1980b).
3. Omvedt (1980a).
4. Misra (1981).
5. Misra (1980).
6. Barua (1980a).
7. Barua (1980b).

observation on Assamese nationalism that turned chauvinistic. The thrust of the argument of the Assamese intellectuals was the opposition to perceived economic exploitation and cultural identity of the Assamese. Here the observation of Misra (1986) summarises the perspective of Assamese middle class.

> The demand for deletion and deportation of foreign nationals in the state must be viewed not in isolation but in the broad perspective of Assamese national question. Such a demand is, in fact, aimed at identifying and preserving the identity and culture of people whose economy, land system and overall way of life has many differences, even now with most other states of Indian Union …It would be erroneous to see the movement as one purely directed against outsiders and whose motive force is Assamese chauvinism, led and fostered by numerically small and economically weak but culturally influential middle class.

19.3.4 Society, Culture and Economy

It is an irony that a society that justifiably prides itself of its cultural achievements should lag behind economically. The reasons for the slow economic progress are different for different regions. What is common is the socio-political instability in most states. Different regional communities view their problems differently. Some like the Nagas were opposed to their inclusion in the Indian Union right from 1947. Others like the Mizos started their secessionist movement a little later. The Khasis and the Garos of Meghalaya also wanted an independent state, but their leaders were opposed to a violent armed struggle. In Assam, the illegal immigration of Bangladeshis and the indifferent approach of the Central Government provided the necessary trigger for a mass movement. The prolonged and violent movements brought to a halt the economic growth of the region. Even well-intentioned efforts were disregarded and often failed for lack of public support.

19.3.5 Isolation of the Hill Areas

It must be underlined that the state of Assam even before India's independence in 1947 was divided into hill and plain areas. The hill districts of Naga Hills, now Nagaland; Lushai Hills, now Mizoram; North Cachar Hills, Mikir Hills, now Karbi-Anglong; and even Khasi and Jaintia hills were included in Assam's hilly areas. Some of these hilly areas like Nagaland and Mizoram were isolated by Inner Line Regulations of 1873, which debarred the plains people from entering the area without specific permission of the government. This caused the isolation of tribal communities in areas like Naga Hills.

The Inner Line Regulations, though meant to protect tribal communities from the plains, caused their isolation, despite the benevolent rule of the British government. That isolation fostered among Naga and Mizo communities a feeling that they are a different nation and have a culture that must be protected by seceding from Indian

Union. As if the Inner Line Regulation was not enough, the Indian Constitution, as a matter of protection to the interests and culture of the tribal communities, treated them differently from other areas of Assam as excluded or partially excluded areas. In the first category were the districts of the Naga Hills, Lushai Hills, North Cachar Hill and North-East Frontier Tract (Sadiya, Balipara and Lakhimpur frontiers), and in the latter category, i.e. partially excluded areas, Garo Hills, Mikir Hills (Karbi-Anglong district) and British portion of Khasi-Jaintia Hills were included.

This resulted in two things. First, the tribal communities began to see their existence separately from the State of Assam, and secondly, no economic progress took place in these excluded and partially excluded areas, because of isolation.

19.3.6 Decades of Instability: A Phenomenon Retarding Development

Ever since independence, some part or the other of North-Eastern India has always been in turmoil, and the situation is not quite settled. Simmering discontent is still noticed in many parts. In some areas, as in Nagaland, there was prolonged conflict and now a prolonged ceasefire. Some states like Mizoram and Manipur are reconciled to their existence as a state of Indian union and enjoying a measure of peace stability, vital to the economic development of the region. Unstable conditions still exist in Nagaland, Garo Hills, and parts of Assam at a non-political level, represented by some insurgent groups. The perpetually continuing movements and insurgencies, demanding either a separate independent state of Assam, as is the case with ULFA (United Liberation Front of Assam), or a separate state, to be carved out of the present area of Assam, as is the demand of the Bodo Tribal Group, occasionally erupt in violence causing loss of life and property. But more than the loss of lives and property, these violent events cast a shadow on the emerging congenial atmosphere, necessary for private investment and economic development of the region. A similar, though far, more serious law and order situation exists in the state of Manipur, where there are a number of insurgent groups operating without any clear objective and support of the people.

In case of Assam, the issue of the detection and repatriation of illegal immigrants from Bangladesh, a phenomenon that started during colonial rule but continued at an accelerated rate even after independence, provided the necessary trigger for a mass movement in the 1980s of last century.

19.3.7 The Anti-foreigners' Movement of 1980's

The anti-foreigners movement of Assam spearheaded by All Assam Students Union and supported by All Asom Gana Sangram Parishad (A.A.G.S.P.), Asam Sahitya Sabha and Asom Jahyabadi Dal (A.S.D.) was a critical period in the history of Assam and brought to a grinding halt whatever progress was made. It was the period

during which United Liberation Front of Assam (ULFA) was born in 1979. The demand for 'detection and deportation of illegal immigrants' was long standing since 1973, but it reached a critical point with the refusal of Central Government to revise the electoral roll for the parliamentary election.

The movement that started as a disciplined campaign soon turned into a violent and aggressive attack against non-Assamese. A chain of massacres occurred at Chawlkhowa in South Mangaldai and in Khoirabari north of the town. The Nellie district in Morigaon district witnessed the worst massacre of immigrant Muslims in 1983. The movement subsided with the Assam Accord (August 1985), signed between the Government of India, the State Government and the leaders of the anti-immigration movement. This accord had certain specific clauses that assured the economic progress of Assam and included, among other clauses, building of another oil refinery that has materialised at Numaligarh refinery in Golaghat district; establishment of an Indian Institute of Technology (IIT) that is now in place and the Institute is functioning at Guwahati; and the opening of a Central University in Assam that has become a reality with the establishment of Assam University, at Silchar. Almost all the assurances given through the Accord are fulfilled. The most significant promise that remained unfulfilled is the detection and deportation of illegal immigrants, partly because of the lethargy of the Government and the implementing agencies and partly because of real difficulty encountered on the ground.

While some measure of peace returned, the ULFA continued its secessionist activities with a banner of revolt, demanding complete sovereignty. The movement, after more than three decades, has suffered fatigue, and the insurgent group has now entered into negotiation with the Central Government, notwithstanding the fact that a section of the militant group is against talks with the Government.

19.3.8 Emergence of a Large Number of Insurgent Groups

In the wake of the anti-foreigners movement, a large number of insurgent groups with their bases in specific tribal communities have emerged, to name a few, A'chik Liberation Matgrik Army (Garo Hills – ALMA), Autonomous State Demand Committee (Karbi-Anglong – ASDC), All Tripura Tiger Force (Tripura – ATTF), Dima Halam Daogah (N. C. Hills – DHD), Hynniewtrep A'chik Liberation Front (Khasi Hills – HALC), Kangleipak Communist Party (Manipur – KCP), Kuki National Army (Manipur – KNA), National Democratic Front of Bodoland (NDFB) and many others. The National Socialist Council of Nagaland, still active under ceasefire mode, and Mizo National Front (now a political party) are the older groups. Each insurgent group has its own charter of demand, but the hostility in each case is directed toward the Central Government. Though notionally still alive and devoid of any serious political objective, some of these insurgent groups have turned extortionists, while some others have started indulging in banditry. Most have lost a clear objective and are deprived of mass support.

The movement, though justified as a peaceful campaign, suffered a setback and left a permanent scar on Assamese society following unabridged savagery in the 1980s.

Peace has returned, but there is deep discontent on the issue of foreigners in Assam. What is worse is what started as a move against illegal migrants, turned anti-non-Assamese. The non-Assamese were caught in a crossfire. The result was the killing of many Indian citizens, who are migrants from other states and settled in Assam for generations.

The process of integration suffered a setback because of the insurgent groups that had some mass base in the initial stage of the movement. As the movement has subsided, normalcy has slowly returned. But, even today, violence erupts occasionally claiming precious lives. Mindless bomb explosions, in busy market areas of Guwahati, causing death and destruction have been witnessed during the last decade.

19.3.9 Resistance to Entrepreneurial Initiative in the Region

Besides the fact that the entrepreneurs shy away from insurgency and disturbed condition in the region, the radical elements in the society in the North-East are opposed to any private investment in the region. This is largely because of the fear of exploitation by vested interests. The opening of a five star hotel by a well-known industrial group, of Indian origin, faced protest and opposition. It is difficult to judge the Assamese fear of exploitation by outside elements. Sometimes, even serious development projects are opposed. The fear of 'others' and the movement of the 1980s still have their echo in the contemporary society. What is worse is the attitude of other tribal communities like the Bodos who, inspired by the movement against the foreigners, began cleansing certain areas dominated by them, of the non-Bodos but especially non-Assamese, to claim and justify a Bodoland state for them. Today Assam does not face much threat of illegal infiltration from Bangladesh, but the separatist movements of Dimasa and Bodo communities is no less troubling. Disenchantment with the Central Government is slow to decline, but the development works need to be encouraged and expeditiously executed.

As India was gripped with the fear of foreign capital and economic exploitation in the early years of its independence, so is the case of Assam today, apprehensive of not only the capital flowing into the state from outside of India, but even from Indian entrepreneurs. The opening of Indian economy to foreign investment and consequent growth should serve as an example to emulate. The state will certainly benefit from such activities that create wealth and generate employment, no matter what the source of capital and technology is.

19.3.10 The Path Ahead

An impartial observer would think that the North-East India has a bright future. Loaded with untapped resources and a relatively low density of population, it could be the fastest growing region in the country. Some recurring hazards like

floods in Brahmaputra, landslides in the hilly areas, have to be technologically tackled. Interstate acrimony should end, and the states should cooperate with and complement each other, in the march toward progress. The people of the region have to be assured that development would not lead to much feared exploitation, and necessary safeguards should be provided. A greater degree of tolerance is needed on the part of the communities in Arunachal Pradesh, Nagaland, Mizoram, Manipur and Meghalaya. These states have a relatively low density of population, yet the arrival or the settlement of a few thousand refugees causes resentment. Capital would flow in, and the entrepreneurs would arrive only when the conditions are conducive and they feel welcome. This is as true with entrepreneurs as with the tourists.

There is a contradiction in the policy of the Central Government. Many states in the region need not only financial and budgetary help, but all kinds of technical expertise and administrative support for the growth of the economy. Yet a large number of people having spent their entire life in these areas denied the domicile status not only for themselves but even for their children who are born, brought up and educated in the state. A review of the status of 'Inner Line Regulation' and the status of 'Excluded and Semi-excluded States' will ameliorate the situation, conducive to the growth of the region.

19.3.11 Inner Line Permit and the Concept of Excluded and Partially Excluded Areas

The 'Inner Line' rule was introduced during British rule in 1873 to protect tribal communities in Naga Hills, Lushai Hills and even North-East Frontier Areas from the exploitative mechanism of the plains people. The system continues even today. One cannot enter Arunachal Pradesh, Nagaland and Mizoram without a valid permit, which is usually valid for a week. This is a farce and a mockery of democracy. Engineers, architects, doctors, teachers, horticulturists and agricultural scientists from other states work in these areas but on a permit, with no provision for a longer stay after their retirement or grant of domicile status to their children. North-East India is a tourists paradise, and the states expect a boost in tourism, yet their policy toward people from other states is so restrictive that tourism offices are in place without being able to promote tourism.

The Inner Lines are restrictive and are detrimental to the growth of any enterprise or tourism in the area. The oft-quoted statement by the leaders of these states is that they don't want to be reduced to another Tripura where the native population was swamped by refugee immigrants. The people of the region have to understand that there are no parallel situations. People of Maharashtra, Gujarat, Punjab or Tamil Nadu are not dying to migrate to Mizoram, Nagaland and Arunachal Pradesh, but a free movement and intercourse could certainly improve the interaction, exchange of idea, better understanding of the regional problems that may incentivise investment in the region and its growth.

19.3.12 Finance and Development

Most states of the North-East receive, and justifiably so, a large central contribution in their budget, not only as their share of central taxes, but a far greater share, in the form of grant-in-aid which sometimes forms as much as 50 % of the total budget of the state. It is only appropriate that the poorer states of the country, including those of the North-East, receive substantial grants from the Federal Government to strengthen their revenue base and develop their economy.

Let each region and community be proud of its culture and literature and preserve them. Literature and culture are the lifeblood of a community, and these should be nurtured and preserved, yet every aspect of life is meaningful only in the situation of an assured and robust material existence. Healthy life, incorporating a proper nutrition, education, health care, mobility and a harmonious community living, is all economy driven. A sound economy is, therefore, the sheet anchor for a healthy society and provides a robust support for its literacy and cultural achievements.

In any objective, assessment of the North-East region only finds variety and richness in its culture and literary achievements, yet the economic picture looks subdued if not outright dismal. The country and the region have to strive together, without assigning blame to each other, to bring the region up economically.

References

Barpujari HK (1998) Northeast India: problems, policies and prospects. Spectrum Publications, Guwahati

Barua H (1954, reprint 1991) The red river and the blue hill. LBS, Guwahati

Barua H (1965) Assamese literature. National Book Trust, New Delhi

Barua SK (1980a) Economic & Political Weekly, March

Barua SK (1980b) Economic & Political Weekly, May 17

Barua PC (ed) (1990) Development planning of Northeast India. (Agricultural, economic, environmental, financial, industrial, manpower and rural). Mittal Publications, New Delhi

Barua AK (1996) Assam playing ethnic politics. Front Line 13(9):4–17

Baruah AK (1986) Elites in a colonial hinterland. In: Abbi BL (ed) North-East region: problems and prospects of development. Centre for Rural and Industrial Development CRRID, Chandigarh

Bezbaruah MP (2010) Socio-political transition, growth trends and development attainment in the Northeast in post-Independence period. In: Nayak P (ed) Growth and human development in Northeast India. OUP, New Delhi

Bhattacharyya HK (1998) Economic development in Assam. APH, New Delhi

Bose ML (1989) Social history of Assam. Concept, New Delhi

Chatterjee P (1998) Community in the East. Economic & Political Weekly 33(6, Feb):7–13

Chattopadhyay DK (1990) History of the Assamese movement since 1947. Minerva Associates Publications Pvt., Calcutta

Das SK (1980) Demographic transformation of Assam. Economic & Political Weekly XV(19, May 10):852

Das NK (2001) Regionalism and ethnicity in the Northeast. J Anthropol Soc India 50:1–16

Dubey SM (1980) The Assam movement: a preliminary study in sociology of political development. Man Dev 2(3):60–75
Gohain H (1980a) Economic & Political Weekly, March 22
Gohain H (1980b) Assam: tangle jarganised. Economic & Political Weekly XV(32, Aug. 9): 1337–1338
Goswami PC (1988) The economic development of Assam. Kalyani Publishers, New Delhi
Guha A (1978) Immigrants and autochthones in a plural society: their interrelations in the Brahmaputra valley in historical perspective. In: Dubey SM (ed) Northeast India: a sociological study. Concept, New Delhi, pp 43–53
Guha A (1980) Little nationalism turned chauvinist: Assam's anti-foreigner upsurge 1979–1980. Economic & Political Weekly XI (Special Number Nos. 41, 42 & 43, Oct):1699–1720, Rebuttals
Guruswami M, Abraham RJ (2010) Left behind: a case study of Assam. Centre for Policy Alternatives, New Delhi
Mathew T (ed) (1983) Northeast hill regions of India: problems and prospects of development. Agricole Publications, New Delhi
Ministry of Health and Child Development Govt. of India (2009) National health profile 2009
Misra T (1980) Assam: a colonial hinterland. Economic & Political Weekly XV(32, Aug. 9): 1357–1364
Misra T (1987) Literature and society in Assam: a study of the Assamese renaissance 1826–1926. Osmons Publication, Guwahati
Misra U (1978) The Naga national question. Economic & Political Weekly XIII(4):618–624
Misra U (1981) Little nationalist turned chauvinism. Economic & Political Weekly XV(8, Feb. 21):290–292
Misra U (1986) The Assam movement and the Assamese national question. In: Abbi BL (ed) Northeast region: problems and prospects of development. Centre for Research in Rural and Industrial Development, Chandigarh
Natrajan N (1970) Mizos social institutional practices. Soc Welf 16(2)
Nayak P (2009) Human development reports of North-East India: a bird's eye view. Placed at Munich Personal Pe PEc Archive
Nayak P (ed) (2010) Growth and human development in Northeast India. OUP, New Delhi
North-East Development Finance Corporation (NEDFi): Data Bank for each State the North-East
Oinam B (2003) Patterns of ethnic conflicts in the Northeast: a study of Manipur. Economic & Political Weekly 38(21, May 24):2031–2037
Omvedt G (1980a) Economic & Political Weekly, March, 12
Omvedt G (1980b) Aspects of the Assamese Problem. Frontier, June 7, Calcutta
Saikia R (2000) Social and economic history of Assam (1853–1921). Manohar Publishers & Distributors, New Delhi
Sharma KM (1980a) The Assamese question: a historical perspective. Economic & Political Weekly XV(31, Aug. 2)
Sharma P (1980b) A region of neglected potentialities. In: Assam and Assamese mind. Assam Sahitya Sabha, Jorhat
Tendulkar SD (2009) Report of the expert group to review the methodology for estimation of poverty. Govt. of India, Planning Commission

Part V
The Future

Chapter 20
Epilogue

Having completed the writing of the book, after 6 years of field observation, data collection, reference work and consultations with many distinguished scholars of North-East India, we begin reflecting on the most lasting impressions we carry with us about the region. One thing is for sure; we would like to see a far more prosperous, progressive and vibrant North-East India than what it is today. It is not merely our wish or a pipedream, but we carry the conviction that this is within the realm of reality. The region is full of resources and inhabited by wonderfully skilled and talented people. Could there be a more ideal combination of factors and opportunities that could accelerate the progress of the region and earn it the respect that a developed and progressive region merits? Why then, the region is still a laggard? We are not in a position either to unveil the historical antecedents or to diagnose the reasons for the present malaise, but are certain about the cure and optimistic about the region's future.

20.1 Resources Versus Human Initiative

The resources are embedded in nature. They have no initiative on their own, but provide requisite inspiration and opportunities. The initiative lies with the people. The awareness of the immense opportunities that the region offers, and the initiative to interact with nature to judiciously utilise its resources, in a planned manner, is the key to its socio-economic resurgence. The glorious past, buried in history, is no guarantee of the region's present-day socio-economic health. The people of each state, talented as they are, have to plan their own growth collectively, without coming in conflict with other groups having another ethnic or regional identity. The question, one may ask, are the people deeply concerned and committed to the growth of the region and the welfare of the people? The answer is not unambiguous, as an inestimable

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amount of energy of the people is lost in emotive, often inconsequential, issues in the name of preservation of their multilayered identity, derived from their history or resulting from a long period of isolation. The perceived threat to their ethnic and cultural identity manifests itself in vociferous protests and demands, which are difficult to concede, as these impinge on rights and aspirations of some other people. Often, the frustration, born out of unfulfilled demand, reveals itself in emotional outbursts, which take the shape of petty squabbles, protests, strikes, blockade of transport routes and even physical violence.

Much of the tussle, that generates excessive passion and consumes a lot of energy of the people, relates to a divergent perception and conflict of interests, between two ethnic groups, between two neighbouring states or between a specific state and the Union Government of India. One of the recurring sources of trouble and conflict is the territorial claims made not only by different states but even different ethnic groups. There is no state in the North-East which has no boundary problem with one or the other of its neighbouring states. Most of the neighbouring states of Assam have some boundary problem or the other with Assam. At least, three of these states, viz. Nagaland, Meghalaya and Mizoram, carved out of a much larger Assam, remain un-reconciled to the interstate boundary, drawn at the time of their formation. The boundary disputes erupt occasionally in ugly border clashes. The most serious demand stems from the militant Naga groups, which demand a larger Nagaland that would include the Naga-dominated contiguous areas of the adjacent states. This involves the three neighbouring states, viz. Arunachal Pradesh, Manipur and Assam. This multidimensional and multi-party issue defies solution. The objection of the neighbouring states is as strong as the demand of the militant Naga groups. This simmering issue, occasionally witnessed in outright hostility or confrontation with the Union Government, has created a situation of instability in more than one state. 'What is the just solution?' is a difficult question to answer, and one would not like to sit in judgement for fear of being in the wrong or hurting one group or the other. What is certain, however, is that the region and its people have suffered immeasurably, and decades are lost in persuasions, arguments and counterarguments and even open hostilities, sacrificing the interests and welfare of the people. It must be added here that Nagaland is not alone in seeking a cession of additional area from the neighbouring states on the strength of linguistic and cultural identity. There are several other states, which make similar demands, but their demands are neither so loud nor so violent.

Not quite similar, but quite an unsettling situation of perpetual disgruntlement exists in Manipur. Innumerable insurgent groups, with undefined or poorly defined objectives and living off extortion from all possible sources, operate as liberators. The disturbed atmosphere has stymied the progress of the state and benefitted no one. Occasional blockade by these groups choke the supply lines of Manipur; the Governments don't use force to vacate these blockades, lest a few should suffer fatal injuries. The beautiful state of Manipur, a paradise on earth, is degenerated into a conflict-ridden state, threatened by illegal border trade and the grip of extortionist insurgent groups who reportedly collect rent from every business and salaried

person on gun point. Whether the contemporary situation in Manipur is the reflection of a social unrest or political turmoil is difficult to judge, what is clear is that an ever increasing number of ethnic groups come with additional demand for a territorial identity for them.

Meghalaya, largely inhabited by the *Khasis* and the *Garo*s, the two principal tribes, with very early contact with British administration and well acquainted with Assam and the rest of India, has yet to come to terms with their rights and obligations under the Indian Constitution, which granted them the statehood. While insurgent groups in Garo Hills area, occupying the western part of Meghalaya plateau, frighten the visitors and entrepreneurs alike, the Khasis spread over roughly two-thirds of eastern Meghalaya have not yet completely emerged out of their dream land of *Syiems*, pretending to be absolute decision makers concerning each and every issue in Meghalaya. What appears strange is that in practically all states of the North-East, but especially in Meghalaya, it is the students' community which spearheads most of the movements and takes crucial decisions. Often, the movements are based on lack of clear understanding of the issues involving legal and constitutional obligations. The city of Shillong, one of the precious assets of Meghalaya, is facing an unrestrained onslaught from the real estate lobbies, but does not seem to be included in the priorities of the State Government or the community. The advantages of a salubrious climate and a highland plateau, that could be harnessed to develop the region into a tourists' paradise, are lost in the absence of infrastructure and an imaginative planning. For decades, Shillong and Tura, the two important cities of Meghalaya, have remained unconnected by a proper all weather road. The Meghalaya society, instead of being aggrieved, needs to be more open and take initiative to develop infrastructure and identify and invest in priority sectors that can bring financial rewards. A society, all the time in a protesting and demanding mood, is likely to neglect its own potential from being realised. Isolation and seclusion are the worst enemies of progress.

Mizoram and Tripura have settled down and are struggling to develop their resources except some minor issues, which have not disturbed the people of these states to affect their life and economy. Both these states, but especially Tripura, have achieved a measure of stability and progress that is obvious. Tripura has good relations not only with other states of India but even with neighbouring Bangladesh, from where tons of fish and thousands of workers arrive every day to work in Agartala, the capital of the state. No society in the North-East region appears as vibrant as the one in Tripura. They are not afraid of their culture being polluted nor are they sceptical of outsiders. Similar is the situation of Arunachal Pradesh, a state with a population of just over a million, struggling to develop its infrastructure and economy with the assistance of the Central Government.

Assam is the parent state of Nagaland, Meghalaya and Mizoram and leader of the North-East in many respects. Economically and culturally, it is the most advanced state of the North-East, with centuries-old literary and cultural tradition. It is the only state in the region having a well-developed language, the Assamese, with its own script and a fine literature. It can, indeed, serve as a model to other states.

20.1.1 Disposition Towards Others

The isolation of many of the states in the region is attributed to their peripheral location, mountainous relief about 1,000–1,500 m above the Brahmaputra plain, and imposed seclusion from other states and people by the '*Inner Line Regulations of 1872*', apparently designed to protect the tribal people from the plainsmen. The Inner Line Regulations disallow non-domiciled persons from entering these hilly states even today. The prolonged seclusion, for almost a century and a half, has resulted in a general attitude of fear and dislike towards others, not from their cultural or ethnic domain. This has also generated a kind of intolerance of others, who, they fear, might exploit them, pollute their culture or simply displace them from their hearth. This fear of '*others*' has gripped even the nontribal population of the region. It must be conceded that neither the Indian Government nor the people of India have reached out to these peripheral states to allay their fears, nor have they made serious efforts to integrate culturally the people of the region with the rest of India.

20.1.2 Cooperation and Confrontation

For reasons, not clearly understood, the region adopts an attitude of confrontation rather than cooperation with the Central and/or the State Governments, on most of the development issues. Most of the states of the region have a government run by the same political party as the Central Government, yet the attitude of non-cooperation is starkly visible. Each state has at least one issue that is most emotive and becomes the leitmotif of the state. It is '*Greater Nagaland*' in the case of Nagaland and '*Detection and repatriation of illegal Bangladeshi immigrants*' in the case of Assam. Similar issues exist in other states, though the expression of protest is not so intense. The result is that many development projects and initiatives get embroiled in controversy and experience resistance from some section of the society or the other. The building of a high-end hotel and broadening of a highway, as much as the construction of a dam either for irrigation or for generation of power, face resistance and demonstration by local or regional communities. Some, like Tipaimukh hydro-electric project, are completely stalled, and some, like Lower Subansiri hydroelectric power project, face stiff resistance. In the latter case, it is the outcome of a sheer lack of understanding between the people of Arunachal Pradesh and Assam. Such protests are common in most states of the North-Eastern region and are widely supported by students' organisations, among others.

20.1.3 The Unattended Problem of Illegal Immigration

Immigration in Assam from Bengal/East Pakistan/Bangladesh is not a new phenomenon; it has existed for almost a century. The poor peasants of Mymensingh always viewed lower Brahmaputra plain as a land of opportunity waiting to be

exploited. They arrived in huge numbers, reclaimed and cultivated land and turned prosperous in due course. (An elaborate account of immigration, legal and illegal, can be seen in the chapter on Migration.) What is alarming is the continued illegal immigration from densely populated areas of Bangladesh, especially after 1947 and most severely after 1971. This has engendered serious social and economic consequences, serious enough to stir the Assamese into the fear of losing the valuable economic resources to the immigrant community and the disruption of social harmony. Today, the issue of illegal immigration is uppermost in the mind of almost every native Assamese. The people of Assam are a most disgruntled lot, and justifiably so, as they perceive that the Central Government has not effectively intervened in the matter to stop the illegal immigration, nor have they seriously implemented the Assam Accord-1985, under which illegal immigrants were to be detected and repatriated. The disenchantment with the Central Government triggered an unprecedented students' movement in Assam in the 1980s, following which some of the most virulent insurgent groups emerged. Some of these groups are still operating in the state, using violence as a means to achieve their objective of liberating Assam from Indian Union. One wonders if the Central Government has fathomed correctly the resentment of the Assamese society, especially its Hindu population, which feels threatened by incessant flow of illegal immigrants from Bangladesh. It must be added that in the opinion of the authors illegal immigration from Bangladesh has virtually stopped, except some odd individuals crossing over the border and taking a job clandestinely. One only hopes that the Central Government of India develops a better understanding of the sentiments of the people of Assam and engages in serious efforts to prevent illegal immigration in the region, specifically Assam. Free from any risk of facing an intruder, the people of Assam will then engage themselves more constructively in an accelerated all-round growth of the state.

20.1.4 Signs of Optimism

A phenomenon that provides the reason to be optimistic about the evolution of better understanding and a more cordial relation between the states of the North-East region and the rest of India is the ever increasing influx of students and other professionals from the North-Eastern region to almost all major cities of India. This community of migrants, from the North-East to most state capitals and university towns in India, would form the bridge to bring the people of the North-East ever closer to a level of integration with the vast mass of humanity in India. This, in turn, would allay their fear of losing identity. A reciprocal movement in the reverse direction, without any hindrance, but with a bar on settlement in the culturally sensitive areas, will be a boost to the development of the region. Freedom of movement will attract investment and goodwill and will transform the economic landscape of these states. There is hardly any doubt that sooner or later this will happen.

20.1.5 Assam: The Unstable Fulcrum of the North-East

Assam is the fulcrum of the North-East that influences the region in no small measure. A stable, prosperous and tension-free Assam with a harmonious societal organisation will be a model for the other states to emulate. It will inspire economic growth, radiate message of goodwill and mutual cooperation and establish good neighbourly relations. It is vital that the problems encountered by the Assamese society and the government receive the attention of the Central Government and all those interested in the well-being of this part of India. The uppermost fear in the mind of an average Assamese, as the authors understood, is the fear of illegal immigration and immigrants, particularly from Bangladesh. Their fear is not imaginary, and there is substance in what they have been complaining about, for decades. The illegal immigrants, once settled, share the limited resources of the state, thus indirectly depriving the Assamese of their legitimate rights. Also, they propagate a culture that is not indigenous to the state, and their growing number is a cause for concern of the local population. This issue needs to be settled by legitimate means to assure the Assamese people of the safety and security of their physical and economic interests.

20.2 Economic Growth of the Region

The traditional approach to the development of the three sectors of the economy – primary, secondary and tertiary – has to be modified and made region specific. Agriculture, constrained by limited availability of cultivable land in the region, has to concentrate on enhancing yield. Besides, it has to be supplemented and even substituted in some situations by horticulture and animal husbandry. Decades are lost in implementing the scheme of terracing sloping land, often subjected to *jhuming* or shifting cultivation. A far more rewarding approach would be to utilise the slopes for horticulture. The authors saw, rather unexpectedly, cashew plantations in Garo Hills, not far from Tura. There are experiments carried out in Arunachal Pradesh, Nagaland and Mizoram, but the propagation of even the successful experiments to the field level and large-scale horticulture is still a far cry. People have to be persuaded of the benefits of these experiments, as it happened in the case of rubber plantation in Tripura, and they will themselves take care of the rest. Dairying is not a part of the cultural tradition of the region, especially with the people of Mongoloid stock who inhabit the peripheral hilly parts. The suitability of climatic conditions, for dairying as an economic enterprise, could be explored and emphasised to attract the people to benefit from this occupation.

The Assamese middle class has a hang-up about the industrial growth of the state and seems to believe that they don't benefit either from the tea plantations, owned by private companies and worked by the descendents of labour, imported during the last century from other parts of India. Equally, the exploitation of petroleum, coal and other minerals does not visibly benefit them except marginally. They perceive that the exploitation of the region's mineral wealth does not benefit the region as much as it should. This is a major issue in regional development and is based on the

proprietary rights of the mineral wealth of a region. Except the royalty that the region gets, there is no other concrete benefit to the people of the state. A stage at which every mineral-producing region could be a stake holder and have substantial stake in the exploitation of the mineral is not yet arrived, but may soon happen. Employment in the mineral exploitation sector is not controlled by the state, and hence the industries employ a considerable number from outside the state. While there is substance in this argument, the industries do employ a large number of people from the region, besides skilled and semi-skilled workers who could be from any part of India. Besides, there are indirect benefits of infrastructure, training and the growth of ancillary industries. Creating a closed industrial system is neither feasible nor economically gainful. A region, as a closed system in the modern world, has hardly any future.

20.2.1 Tourism: A Highly Publicised Failure To Be Transformed into a Gainful Enterprise

Each state of the North-East has a well-staffed department of tourism. Their high-decibel publicity unleashed through electronic and print media drawing on some glorious historical events, emphasising the richness of nature and the region as the home to one-horned rhino, has not produced much result. Kaziranga National Park is the only spot that attracts tourists. It is located on the main national highway no. 37 and is very secure. The state-sponsored Hornbill festival of Nagaland held in December may be another event that witnesses arrival of some domestic and foreign tourists.

Tourism could be real money earner for each of the North-Eastern states, if travel and tour could be made safe and the tourists feel welcome to the region. The beautiful plateau of Meghalaya, the forest trails of Arunachal Pradesh, the sanctuaries of Assam, the wilderness of Mizoram and the fully developed tourist spots in the hilly terrain of Nagaland could attract hordes of tourists, with better transport, safety assurance and a welcoming disposition of the local populace. Is the region safe for the tourists, especially for nature lovers who do not join the guided tours to some specific places? Fear of abduction, extortion and rough handling keeps many potential tourists away. But, the most important question is do the tourists feel welcome as they feel in Rajasthan, Jammu and Kashmir, Madhya Pradesh or Kerala? The region has to introspect, examine the reasons for poor response and revise its strategy to be a gainer and not a loser.

20.2.2 Preservation of Ethnic and Cultural Identity Versus Integration

The newly formed states, based on the territorial concentration of certain ethnic groups, have yet to emerge from the shadow of their past. Despite the impact of Christianity which a large majority of Nagas, Mizos, Khasis, Garos and others have embraced, they not only strive to preserve their ethnic identity but even talk of their

culture which is either completely substituted by ritualistic practices of Christianity or deeply suppressed by it. They have willingly adopted a Western style of living in preference to their traditional practices. Yet, a loud protest from all such states is heard at the mention of the abolition of Inner Line, the restrictive device introduced under the colonial rule to restrict the entry of the plains people in the forbidden tribal domain – all in the name of preserving their cultural identity. The notion that 'Nagaland is only for Nagas' and non-Nagas should not enter this exclusive domain of the tribal people or that 'Mizoram is only for Mizos' and non-Mizos shouldn't be allowed to come closer to it is detrimental to the interest of these groups in the long run and may deprive them of the benefits of cross fertilisation of ideas and cultures. They have, no doubt, significant achievements to their credit in mass education and literacy, but they should be equally concerned about their economy and finances to be truly self-sufficient. A year-after-year wait for Grant-in-Aid and financial packages from the Central Government, not to mention many of the centrally sponsored projects, hardly evokes admiration for these zealots of cultural identity. A case in point is the Khasi ethnic group, which seems to believe that they are the masters of all that they survey and the nation, of which they are a part, has no claim on its resources. At the same time, they expect the Union Government to develop infrastructure, educational and medical facilities exclusively for their benefit. In a recent incident, the North-Eastern Hill University was forced to remain closed for a month by the Khasi students who were insisting on the appointment a Vice Chancellor of Khasi origin, an attempt to usurp the powers of the President of India. Such incidents demonstrate the short sightedness of the leadership of the community. These states need to struggle to strengthen their economy to be able to truly assert their independence and authority.

20.2.3 Human Welfare Is Far More Important than the Preservation of Cultural Identity Through Isolation

20.2.3.1 Stability and Social Harmony

Unless insurgent groups, operating in different parts of the region, are persuaded to see reason and give up violence as a method of achieving their political goal and insurgency is buried, there is no chance of the restoration of normal functioning of the society in the region. Equally important is the firm resolve of the Central and State Governments to stop the menace of illegal immigration. Unless this is achieved, the Assamese society will remain gripped by the fear of the unknown.

If normalcy returns, goodwill prevails, interstate relations improve and a spirit of cooperation develops between the seven states, the region will prosper and will benefit from the free interaction with other states of Indian Union. In a normal situation, the states will attract not only investment and entrepreneurs but even the tourists and scientists, generating a two-way flow of ideas. Let there be realisation that the vastly under-populated state of Arunachal Pradesh, to quote an instance,

is difficult to develop without the cooperation of other states and agencies. The restrictive entry to citizens from other parts of the region or the country hardly evokes any trust and confidence in the future of the state.

20.2.3.2 Harnessing the Benefits of 'Look East Policy'

During the course of field work, the authors frequently heard the prospect of the 'Look East Policy', and the region as the gateway to the East and Southeast Asia. The 'Look East Policy' of the Government of India adopted in 1991 to establish and promote deeper relations with the countries of Southeast Asia has hardly picked up steam. There is no detailed analytical study available to predict the extent to which this region will benefit following the adoption of 'Look East Policy'. The policy carries a political overtone and its economic benefits are only incidental. The trade between India and South and East Asian nations reached a record level of $80 billion, and India sold goods worth $36.7 billion to ASEAN countries during 2011–2012, importing during the same period goods worth $43.2 billion from these countries. This, no doubt, is a quantum jump in the bi-lateral trade between India and ASEAN countries. Additionally, India has a special partnership programme for the least developed countries of Cambodia, Laos, Myanmar and Vietnam – CLMV group – including certain zero duty imports, scholarships and training programmes and other economic aid. With Myanmar, the Indian Government has instituted numerous infrastructure projects that aim at linking India's North-Eastern states – which themselves are set on a new economic growth path – through road and port connectivity to the robust Indian economy. The recent understanding between India and the ASEAN, the Association of Southeast Asian Nations, about free movement of services and investments augurs well for the mutual benefits to all the participants. How far such agreements will benefit India's North-East is the critical question. The benefits, one may expect from the opening of the Trans-Asian Route linking the countries of West Asia with Southeast Asia and passing through this region, are vague and at best confined to border trade between the region and the countries of South-East Asia, such as Myanmar, Thailand, Cambodia and Vietnam. The ESCAP (Economic and Social Commission for Asia and Pacific) may have drawn many route plans including those that pass through India, but progress on this front is very slow. The highways no. 37 and 39, passing through Assam, Nagaland and Manipur, may be the main arterial routes to be developed as an expressway, and the General Stilwell road entering the Chindwin valley from Tirap region of Arunachal Pradesh may be opened as a supplementary road. Yet, the prospect of their turning into high-intensity international routes is uncertain. The countries and the states of India would not sacrifice the advantage of shipment to the countries of Southeast Asia by sea route. Besides, how much the region will develop economically is still in the realm of speculation. A point often brought into focus is the racial affinity of a sizeable segment of the population of the region with Southeast Asia, especially Myanmar, the provenance of Ahoms, the erstwhile rulers of Assam. The momentary

expression of emotional bond with southeast region is hardly sufficient to influence the hard core economic calculations.

Yet, in the growing economic relation between India and ASEAN countries, North-East India has a genuine opportunity. The states of the North-East could put forth strong demands for at least two things. The first is the development and opening of an express highway between North-Eastern states and Southeast Asia. The building of the proposed Trans-Asian Route needs has to be accelerated. Secondly, in the wake of increasing trade between India and ASEAN countries, manufacturing units exporting goods to ASEAN countries could be located in the North-Eastern region of India, and the region could be a focal region for locating entrepôts to export and import goods from Southeast Asian countries. Safety of the trade route and other facilities as well as manufacturing units has to be assured, and that is a major task before the society and administration. It would be possible, if different groups merge their differences and speak in one voice, to influence and motivate the Central Government and the entrepreneurs, to take effective steps to industrialise the region.

20.2.3.3 The Benefits from the Strategic Importance of the Region (?)

The strategic importance of the region cannot be over emphasised in the defence policy of India. No other region of India is strategically so sensitive as the North-East. The region shares an international boundary of around 7,000 km with the neighbouring countries, Bangladesh, Myanmar, Tibet (China) and Bhutan. The Myanmar border with the three eastern peripheral states of the region, viz. Mizoram, Manipur and Nagaland, has seen action during the Second World War in 1944 when the advancing Japanese forces were routed in the battles fought at Imphal and Kohima. The Indo-Myanmar international border (1,624 km) is well demarcated on the ground according to 1968 Boundary treaty, and relatively secure. The Indo-Bangladesh border (3,909 km) is well delineated, and localised disputes born out of some misunderstanding are settled at meetings between the officials from the two sides. Bhutan has very special relations with India and doesn't pose any problem presently. The case of Indo-Tibetan border stands at a different footing. The 890 km long Indo-China border (the McMahon Line) running between India–Burma–China tri-junction, identified with Isu Razi pass, on the east, and India–Tibet–Bhutan tri-junction on the west, is the most sensitive section of Indo-China border. The McMahon line forms the northern border, and partially even the eastern border, of Arunachal Pradesh.

Does the international frontier attract or promote development? The question cannot be answered in simple terms. But, the development of infrastructure in the border areas, especially the roads and other means of communication, directly helps the region. Besides making certain infrastructure available, the development process offers employment to the local population. The authors don't share the view that the strategic importance of the region brings additional benefit to the region besides infrastructure. All the efforts for infrastructural development appear

confined to Arunachal Pradesh. There doesn't appear to be any special initiative to develop infrastructure on the Burmese border. The friendship treaty with Myanmar has slackened the pace of development.

20.2.3.4 Continued Consultations, Discussions, Redressal of Grievances and Cooperation

Most issues related to development, environment, social conflict and interstate rivalry could be addressed if the parties concerned discuss the issues and understand each other's point of view. Whether it is an issue relating to sharing of the resources like water and power, extraction of minerals, transit rights or priorities in development, nothing is beyond the scope of solution by mutual consultations and understanding. Such issues may erupt between ethnic groups like Nagas and Kukis, or between different states, as between Assam and its neighbouring states, or between a state and the Central Government. Each of these issues lends itself to solution, if approached with an understanding and goodwill.

20.2.4 Past, Present and the Future Vision

The people of the region are certainly aware of their past and should have a vision of their future. While an understanding of the past helps society to avoid the risks and uncertainties, a vision of future is what the societies, world over, adopt as the guiding principle. The states and the people of North-East India have to think collectively of their future and develop a vision to chart out a plan for future. This may include their administration, finances, infrastructure, education, health care, employment and several other issues, which may require a strategy to meet the demand of a larger population and growing urbanisation. One thing is certain. Perpetual confrontation and attrition would only emaciate the societies and not strengthen them to take care of their future. Besides, a conflict-ridden situation vitiates the atmosphere for constructive efforts. Maintenance of a harmonious atmosphere is the first step towards progress.

The state of Assam with a density population comparable to that of India is not left with surplus land and is no longer a haven for immigrants to reclaim uncultivated land and settle down to farming. Immigration, therefore, has to stop. Besides, the limited agricultural land with higher productivity would only meet the food requirement of the region without generating enough gainful employment. What is worrying for the region, as much as for the entire country, is the lack of employment opportunities. Hence, development of the secondary sector should be a priority for the states of the region. Industrialisation with concurrent development of service industry could be a long-term strategy for which sustained efforts are needed. This may also boost the economy of the state through export of manufactured goods.

Biodiversity, nature and wildlife, the natural heritage of the state, needs to be preserved. This is in the long-term interest of the region. During the last couple of decades, the state has opened its economy, and more and more people, businessmen, students and job seekers have started moving to other parts of India and are pursuing different trades. This is a very welcome sign. The institutions of higher learning, like the Indian Institute of Technology, are training students and producing employable human power that can hold its own in India or abroad. It is time entrepreneurship that can initiate development of industries was encouraged. And finally, the state has to get over the fear of the 'Immigration Ghost'. Internal problems, like the Bodoland movement, have to find a just solution. The authors, being acquainted with the population density pattern of the state, believe that the movement of the people northward from Dhubri district, regardless of the origin and nationality of these migrants, is caused by a push factor from Dhubri as the latter district is bursting at the seams, as far as the population density and crowding the district are concerned. Moving northward, these people collide head on with the Bodos who are already struggling to have a Bodoland state like the Nagas or Mizos, their small numerical strength (just over 1,500,000) notwithstanding.

The hill states have to be more realistic about their economic viability. To stand apart from the rest of India as an island is not in the long-term interest of either these states or the country as a whole. Socio-economic integration, without infringing on the religious faith or cultural tradition of the people, should be an ideal situation for the hilly states. They have to aim at economic viability, which requires interdependence and an open economy. One understands the fear these states nurture of being overwhelmed by an immigrant population, as it happened in Tripura. It has to be understood that the hilly states, especially Nagaland and Mizoram, don't have much habitable or cultivable land to attract immigrants, nor does one anticipate another influx of refugees like the one from Bangladesh in 1971. Arunachal is altogether a different ball game. It has a vast area, over 83,000 km^2, much of it forest covered, uncultivated or not cultivable, with a population of just over a million. Yet, the state remains a closed system, permitting only one-way movement of capital and human power for its development and disenfranchising the workforce from settling down in the state or even getting a domiciled status. This is a travesty of democracy, and a system of development with imported capital and labour, like the one in Arunachal Pradesh, only shows neighbourly indifference among the states of India.

Some of these issues need immediate attention. It is the responsibility of the government and the people of India to persuade and convince these states of their genuine concern for the development and welfare of the region, and to make them feel and realise that they are as important a part of the country as the rest of India, and identify their welfare with national welfare. Can we set aside party politics and partisan attitude and work on the principle of 'Welfare of the People'?

Bibliography (North-East India)

A

Abbi BL (ed) (1984) North-East region: problems and prospects of development. CRRID, Chandigarh

Acharya NN (1966) History of medieval Assam. Dutta Baruah, Guwahati

Acharya SK (1974) Agriculture in Meghalaya, Mizoram, Mikir and Cachar Hills. Artha Vijnana 16(1):50–76. GIPE, Pune

Acharya KCS (1983) Food security systems in India. Concept Publication, Delhi

Acharya SK, Ghosh SC, Ghosh RN, Shah SC (1975) The continental Gondwana group and associated marine sequences of Arunachal Pradesh (NEFA) Eastern Himalayas. Himal Geol 5:66–82

Acharya SK, Ghosh SC, Ghosh RN (1983) Geological framework of the Eastern Himalayas in parts of Kameng, Subansiri, Siang District, Arunachal Pradesh. GSI Misc Publ 43:145–152

Agarwal AK (1999) Energy for economic development: a case for North-East India. In: Banerjee A et al (eds) Economic planning and development of North-Eastern States. Kanishka Publishers, New Delhi, pp 183–192

Aggarwal KS (ed) (1999) Dynamics of identity and intergroup relations in North-East India. IIAS, Shimla

Ahmed KA (2010) The Muslims of Assam. EBH Publishers, Guwahati

Aier A (2003) Cultural relations of Nagaland with Assam, since pre-historic times. Seminar Papers, Guwahati

Alemchiba M (1970) A brief historical account of Nagalan. The Naga Institute of Culture, Kohima

Ali I, Nisar A (1979) Hindu – Muslim relations in Assam. Man India 59(4):361–382

Allen BC (1902) Census of India 1901, vol IV. Assam Secretariat Printing Press, Shillong

Allen BC (1905a) Assam district gazetteers, vol IV, Kamrup. Reprinted 1995, Govt. of Assam, quoted in J Asiat Soc Bengal 41(pt. I):49–100

Allen BC (1905b) Gazetteer of Naga Hills and Manipur. Assam district gazetteers, vol XI, Shillong. Reprinted 1981, Gyan Publications, Delhi

Allen BC (1905c) Assam District Gazetteer, vol I, Cachar, vol II, Kamrup. Table VII, Crop Statistics

Allen BC (1906a) Assam District Gazetteer, Khasi and Jaintia Hills, vol X. Reprinted, Gyan Publication, Delhi

Allen BC (1906b) Assam District Gazetteer. Lakhimpur, Shillong

Allen BC, Gait EA, Allen CG, Howard HF (1909) Gazetteer of Bengal and Northeast India. Reprinted Mittal Publications, 1979, 1984, Delhi

Anonymous (1872) Tipera and Chittagong Kukis. Indian Antiq 1:225–226

Anonymous (2005) State of the forests report. Forest Survey of India, Dehradun

K.R. Dikshit and J.K. Dikshit, *North-East India: Land, People and Economy*, Advances in Asian Human-Environmental Research, DOI 10.1007/978-94-007-7055-3,

Aram M (1974) Peace in Nagaland. Arnold Heineman Publishers, Delhi
Assam Chief Commissioner's Office (1897) Report on the earthquake of June 12, 1897 Submitted to the Secretary, Government of India, 14 Aug 1897, p 4
Assam Chief Commissioner's Office (1906) Report on tea culture
Assam District Gazetteer (1928) The Sadya and Balipara frontier tract, vol XI
Awasthy AK (1978) Gazetteer of India – Assam, Nowgong District. Govt. of Assam, Guwahati
Awasthy AK (ed) (1979) Gazetteer of India – Assam, Goalpara District. Govt. of Assam, Guwahati
Awasthy AK (2003) A brief review of the investigations of landslides in North-East India. In: Husain Z (ed) Environmental issues in North-East India. Regency Publications, New Delhi, published for NE Council for Social Science Research, Shillong, pp 3–10

B

Bailey FM (1912) Journey through the portion of southeastern Tibet and Mismi Hills. Geogr J 39:334–347
Bailey FM (1914) Explorations of the Tsangpo or Upper Brahmaputra. Geogr J 44(4):341–364
Baishya P et al (1997) Development issues of North-east India. LBS, Guwahati
Bana's 'Harsha Charita' tr. By Cowell & Thomas, pp 211–23 quoted from Choudhury PC (1987-3rd edn) History of civilization of people of Assam to the XIIth century AD. Spectrum Publications, Guwahati, p 164
Bandopadhyay PK (2005) North-East saga. Publication Division, Govt. of India
Bandra G (1975) The Kuki uprising: its causes and nature. Man India 55:1
Banerjee AC (1943) Eastern frontier of British India, 1784–1826. Calcutta
Banerjee S (2004) Pnar social structure. In: Basu A, Das Gupta BK, Sarkar J (eds) Anthropology for North-east India: a reader. Special Publication of the Indian National Confederation and Academy of Anthropologists, Indian Anthropological Society & National Museum of Mankind, Kolkata
Banerjee A, Kar B (eds) (1999) Economic planning and development of North Eastern States. Kanishka Publishers, New Delhi
Banerji RD (1924–25) Neolithic implements from Abor country. Annual report. ASI, Calcutta/Simla
Banthia JK (ed) (2001) Census of India 2001. First report on religion. Government of India
Bardolai BK, Athaparia DK (eds) (2003) People of Assam (in two parts) In: People of India series, vol XV. Seagull Books, for Anthropological Survey of India
Bareh H (1957) History and culture of Khasi people. Shillong, (1985) 2nd rev edn. Spectrum Publication, Guwahati
Bareh H (1964) Khasi democracy. Don Bosco School, Shillong
Bareh H (1970) Nagaland District Gazetteer. Calcutta
Bareh HM (2001) The Encyclopaedia of North-East India (in eight volumes). Mittal Publications, New Delhi
Barkataki S (1969a) Assam. In: India: the land and the people' series. NBT, New Delhi
Barkataki S (1969b) The tribes of Assam. NBT, Delhi
Barman R (1984) Social landscape of Bojali. M.Phil. dissertation, Gauhati University
Baroah DP (ed) (1976) Gazetteer of India – Assam, Lakhimpur District. Govt. of Assam, Guwahati
Barooah U (1929) A glimpse of Assam; past and present. Jorhat
Barpujari HK (1970) Problems of hill tribes: North East frontier 1822–42. LBS, Guwahati
Barpujari HK (1977) Political history of Assam, vols 1 and 2. Govt. of Assam, Guwahati
Barpujari HK (1981) Problems of hill tribes of North-East frontier, 1873–1962. Spectrum Publications, Guwahati
Barpujari HK (1986a) Assam in the days of the company (1826–1858). A critical and comprehensive history of Assam during the rule of the East India Co. from 1826–1858. NEHU, Shillong

Barpujari HK (1986b) American missionaries and North-East India, 1836–1900. Spectrum Publications, Guwahati
Barpujari HK (1988) An account of Assam and her administration 1603–1822 AD. Spectrum Publications, Guwahati
Barpujari HK (1998) North-East India: problems, policies and prospects. Spectrum Publications, Guwahati, 185 p
Barpujari HK (2003) The Nagas: the evolution of their history and administration (1832–1839). Spectrum Publications, Guwahati
Barron L (1872) Notes on stone implements from Naga Hills. J R Anthropol Inst 1:61–62
Barua A, Choudhury SB (1999) Gazetteer of India, Assam State Gazetteer, vol I. Govt. of Assam, Guwahati
Barua BK (1935) The administrative system of Kamrupa. JARS 3:23–32
Barua BK (1941) Assamese literature. IBH, Bombay
Barua BK (1951) A cultural history of Assam. K. K. Barooah, Nowgong, p 12
Barua BK (1960) Shankardeva; Vaisnava Saint of Assam. Assam Academy for Cultural Affairs, Gauhati
Barua HC (1908) Notes on marriage systems of the people of Assam. Ananda Ram Barua, Sibsagar
Barua H (1954) The red river and the blue hill. LBS, Guwahati, Reprint 1991
Barua H (1965) Assamese literature. NBT, Delhi
Barua I (1979) Changing occupational structure in two villages of Assam. Man India 59(1):106–119
Barua KL (Rai Bahadur) (1933) Early history of Kamarupa from the earliest times to the end of the 16th century. Shillong (published by the author), 2nd edition in 1966 published by Lawyers Book Depot, Guwahati
Barua KL (Rai Bahadur) (1935) Kamrupa in the IXth century A.D. JARS 3:2–5
Barua KL (Rai Bahadur) (1939) Prehistoric culture of Assam. JARS 7:35–41
Barua KL (Rai Bahadur) (1966) Early history of Kamrupa. LBS, Guwahati
Barua KL (Rai Bahadur) (1985) A comprehensive history of Assam. Munshiram Manohar Lal, New Delhi
Barua N (2010) Historical geography of early Assam. DVS Publishers, Guwahati
Barua PC (ed) (1990) Development planning of North-East India. Mittal Publications, New Delhi
Barua S (1997) Cutting the state to size. Seminar No. 459, November
Barua S (1999) India against itself – Assam and politics of nationality. Pennsylvania University Press, Philadelphia
Barua S (2004) Between South and South-East Asia: North-East Asia & the look east policy. CNISEAS, Guwahati
Barua SN (1991) Tribes of Indo-Burma border. Mittal Publications, New Delhi
Baruah TKM (1960) The Idu Mishmis: the people of NEFA (North-East Frontier Agency). Govt. of Assam, Shillong, 110 p
Baruah AK (1986) Elites in a colonial hinterland. In: Abbi BL (ed) North-East Region: problems and prospects of development. Centre for Rural and Industrial Development CRRID, Chandigarh
Baruah AK (1991) Social tensions in Assam middle class politics. Purbanchal Prakash, Guwahati
Baruah AK (1992) Nationalism, regionalism and the problem of integration in India. In: In search of India's Renaissance. CRRID, Chandigarh
Baruah AK (1995) Do we need to build a nation? In: Phukan G, Dutta NL (eds) Politics of identity and nation building in North- East India. South Asian Publishers, New Delhi
Baruah AK (1996) Assam playing ethnic politics. Frontline 13(9), May 4–17
Baruah AK (ed) (2002) Student power in North-East India. Regency Publications, New Delhi
Baruah AK, Dev R (2006) Ethnic identities and democracy and electoral politics in North-East India. Regency Publication, New Delhi
Baruah AK, Sharma M (1991) Nationality question in Assam: some conceptual issues. In: Misra U (ed) Nation building and development in North-East India. Purbanchal Prakash, Guwahati
Basu NK (1970) Assam in the Ahom age. Sanskrit Pustak Bander, Calcutta

Basu A, Kohli A (eds) (1998) Community conflicts and the state in India. Oxford University Press, Delhi
Basu A, Das Gupta BK, Sarkar, J (2004) Anthropology for North-east India: a reader. Special Publication of the Indian National Confederation and Academy of Anthropologists, Indian Anthropological Society & Museum of Mankind, Kolkata
Battacharjee (2010) Revisiting the western boundary of Kamrup. Northeast Res 1:58–68
Bendangangshi (1993) Glimpses of Naga history. Mokokchung, Nagaland, p 106
Bezbaruah MP (2010) Socio-political transition, growth trends, and development attainment in the North-East in the post-Independence period. In: Nayak P (ed) Growth and human development in North-East India. OUP, New Delhi
Bezboruah PN (2007) Demographic threats in Assam. North-East Study Centre, Guwahati
Bhagabati AC (2003) Structure and change in Arunachalee society: some observations. In: Goswami P (ed) Insight – a collection of articles. Department of History, Gauhati University, Guwahati, pp 142–146
Bhagabati AC (2004) The tribe as a social formation: the case of Tangsa of Arunachal Pradesh. In: Basu A et al (eds) Anthropology for North-East India, a reader. Indian National Confederation and Academy of Anthropologists, Indian Anthropological Society & National Museum of Mankind, Kolkata
Bharati A (1965) The Tantric tradition. Rider, London
Bhat S (1975) The challenge of the North-East. Popular Prakashan, Mumbai
Bhattacharjee AK (1973) Political evolution of Nagaland 1885–1965. The Book Trust, Calcutta
Bhattacharjee PN (1983a) The Jamatiyas of Tripura. Govt. of India, Agartala
Bhattacharjee KK (1983b) North East India: a study. Cosmo, New Delhi
Bhattacharjee PR (1994) Economic transition in Tripura. Vikas Publishing House, Delhi
Bhattacharyya HK (1998) Economic development in Assam. APH, New Delhi
Bhaumik S (1996) Patterns of minority violence in North-East India. quoted from N Das (2002) Regionalism, ethnicity and nationalisation in North-East India. In: Joshua Thomas C (ed) Dimensions of displaced people in North-East India. Regency Publications, Delhi
Bhuiyan JC (2006) Illegal migration from Bangladesh and the demographic change in the North-East region. In: Kumar BB (ed) Illegal migration from Bangladesh. Concept, Delhi, p 85
Bhushan C (2004) The terrorism and separation in North-East India. Kalpaz Publications, Delhi
Bhuyan SK (1940) Anglo-Assamese relations: 1771–1826. (2009) LSB, Guwahati
Bhuyan SK (1965) Studies in the history of Assam. Published by Laksheswari Bhuyan, Guwahati
Bhuyan GN (1993) Archaeology in North-East India. In: Medhi DK (ed) Man and environment in North-East India. Omsons, Guwahati: 25–47
Bishop SO (1885) Sketches of Assam. Thomas S. Smith, Calcutta
Biswas JK, Angami JK (2001) Remote sensing studies in parts of Southern Meghalaya with special emphasis on Dauki fault zone. GSI Rec 133(pt. IV):7
Bopardikar BP (1972) Prehistoric investigation in Daphabum (NEFA). In: Deo SB (ed) Archaeological congress & seminar papers, Nagpur, pp 1–8
Bor NL (1935) Conifers of Balipara frontier tract. Indian For 61(5)
Bor NL (1938) A sketch of the vegetation of Aka Hills, Assam: a syn-ecological study. Indian For Rec 1:103–107
Bor NL (1942) Relict vegetation of Shillong Plateau, Assam. Indian For Rec, Botany 3:153–195
Bora AK (2009) Forests of Barak valley: the case of upper Jiri reserved forests. In: Bhagabati AK et al (eds) Areas of concern: geographical status of selected problem areas of Assam. Geography Department, Gauhati University, Guwahati, pp 23–35
Bordoloi G, Neog AK (1986) The economy of North-East India. LBS, Guwahati
Borooah GH (1985) Population geography of Assam. Mittal Publications, Delhi
Borthakur DN (1981) Increasing rice production in Assam. Bulletin prepared for special problem of increasing rice production of Eastern States, ICAR Research Complex for NE Hill Region, Barapani
Borthakur DN (1992) Agriculture of the North-Eastern region with special reference to hill agriculture. Beecee Prakashan, Guwahati, p 265

Bose ML (1978) British policy in North-East frontier agency. Concept, New Delhi
Bose ML (1979) Historical and constitutional documents of the North-east, 1824–1973 New Delhi
Bose ML (1989) Social history of Assam. Concept, New Delhi
Brahma K (1992) A study of socio-religious beliefs and practices and ceremonies of the Bodos. Gauhati University, Ph.D. thesis, Punthi Pustak, Calcutta
Brahma S (2006) The religion of Boros. DVS Publishers, Guwahati
Brandis D (1906) (1990, reprint) Indian trees: an account of trees, shrubs, woody climbers, bamboos and palms in British Empire. Constable and Co., London
Bras NB (1998) Politics, society & cosmology in India's North-East. OUP, New Delhi
Brown JG (1914) Grooved stone hammers from Assam and the distribution of similar forms in Eastern Asia. J Asiatic Soc Bengal 10:107–109
Brown JG (1936) India's mineral wealth. OUP, Bombay
Buchanan-Hamilton F (1807) An account of Assam, with some notices concerning neighbouring territories. First compiled 1807–1814; Bhuyan SK (ed) (1940) Govt. of Assam, Guwahati
Burgohain AK, Surendranath M, Bora A (1996) Systematic geological mapping of North Cachar Hills and Cachar Districts, Assam. GSI Rec 128(pt. IV):18
Burtt-Davy J (1939) Review on the classification of tropical woody vegetation types. Indian For Rec 13:81–83
Butler (Capt.) John BSC (1847) A sketch of Assam with some account of the hill tribes by an officer. Smith, Elder & Co, London
Butler (Capt.) John BSC (1855) Travels and adventures in the Province of Assam. Smith Elder & Co, Calcutta
Butler (Capt) John BSC (1875) Rough notes on the Angami Nagas and their language. J Asiatic Soc Bengal 44(pt. IV):307–346

C

Cantlie A (1984) The Assamese. Centre for South-Asian Studies, SOAS, University of London, London
Carey BS, Tuck HN (1896) The Chin Hills: a history of people, British dealings with them, their customs and manners and a gazetteer of their country. Cultural Publishing House, Delhi, Reprinted 1983
Census of Assam 1881 & 1891 incl. Reports, Supdt. Govt. Printing Press, Calcutta 1883
Census of India (1991) Languages, language atlas of India
Census of India (2001) Scheduled tribe atlas of India, New Delhi
Census of India for different years 1901 to 2011
Central Ground Water Board, India (1996) Ground water statistics. Quoted from: Water and related statistics, pp 51, 52, 63, 65. Central Water Commission (2000) New Delhi
Central Statistical Organisation (2006) Selected socio-economic statistics of India. Ministry of Statistics and Programme Implementation, Govt. of India, http://mospi.nic.in
Central Water Commission (1989) Major river basins of India – an overview. Basin Planning and Management Organisation, Ministry of Water Resources, Govt. of India, p 21
Central Water Commission (2000) Water and water related statistics, Table 1.8. Ministry of Water Resources, Govt. of India, p 23
Centre for North-East Study and Policy Research (C-NES) (2004) India's North-East & Bangladesh – problems & opportunities. Centre for Northeast Studies and policy Research, New Delhi
Chakrabarti S (2009) Conservation of orchids by the people of North Eastern India. NeBIO, (NECEER), Imphal 1(1): 48–52
Chakrabarti SB, Changsan C (2004) Customary rights and the question of land: continuity and change in North-East India. In: Basu A et al (2004) Anthropology for North-east India: a

reader. Special Publication of the Indian National Confederation and Academy of Anthropologists, Kolkata, pp 100–110
Chakraborty BC (1964) British relations with hill tribes of Assam since 1858. Firma K.L. Mukhopadhyay, Calcutta
Chakraborty S (1972) The Dauki lineament along the southern part of Meghalaya Plateau. GSI Misc Publ 31
Chakraborty DK, Verma RP, Gautam AM, Narsimha J (1987) Geological map of northeastern part of India: a landsat overview. GSI Res 115(pt. III&IV):65–74
Chakravarty IN, Chakravarty LN (1973) Glimpses of early history of Arunachal. Research Department of Arunachal Pradesh Administration, Shillong
Champion HG (1936) A preliminary survey of the forest types of India and Burma. Indian Forest Records (New series), vol I:1–179. Manager of Publications, Delhi, p 173
Champion HG, Seth SK (1968) A revised survey of forest types of India. Natraj Publishers, Dehra Dun, p 404
Chasie C (1999) The Naga Imbroglio. Standard Printers, Kohima
Chasie C (2003) Cultural relations of Nagaland with Assam since pre-historic times. Seminar Papers, Guwahati
Chasie C (2005) Nagaland. In: Murayama M et al (eds) Sub-regional relations in the Eastern South Asia – with special focus on India's North Eastern Region. Research programme, Series No. 133, IDE-JETRO, pp 243–276
Chattapadhay B, Ray RK, Srivatava SNP (1983) Structure and statigraphy of the ophiolites and associated rocks around Chingal, Manipur East district, Manipur, India. GSI Misc Publ 43:167–175
Chatterjee SK (1950) Kirata Jana Kriti, the Indo-Mongoloids: their contribution to the history and culture of India. J R Asiat Soc Bengal 16(2):22, Calcutta
Chatterjee SK (1955) The place of Assam in the history of civilisation of India. Banikant a Kakati memorial lectures 1954. University of Gauhati, Guwahati
Chatterjee P (1998) Community in the East. Econ Polit Wkly 33(6):7–13
Chattopadhyay DK (1990) History of the Assamese movement since 1947. Minerva Associates Publications, Calcutta
Chaube SK (1999) Hill politics in North-East India. Orient Longman, Hyderabad
Chaudhuri JG (1980) Tripura: the land and its people. Leeladevi Publication, Delhi
Chaudhury JN (1970) The hill Miris of Subansiri. Directorate of Research, NEFA, Shillong
Chaudhury JN (1973) Arunachal Panorama. NEFA, Shillong
Chaudhury MM (1980) Tribes of Assam plain. Govt. of Assam, Guwahati
Chaudhury JN (1983) Arunachal Pradesh. Cosmo Publications, New Delhi
Chief Commissioner of Assam (1897) Report on the earthquake of June 12, 1897. Submitted to the Secretary, Government of India, 14 Aug 1897, p 4
Choudhury PC (1941) Neolithic culture of Kamarupa. Assam Res Soc 9(1–2):1–47
Choudhury BN (1958) Some cultural and linguistic aspects of Garos. LSB, Gauhati
Choudhury PC (1959/1987) History of civilisation of the people of Assam to the 12th century AD. Spectrum Publication, Guwahati
Choudhury DP (1978a) North-East Frontier of India 1865–1914. Asiatic Society, Calcutta
Choudhury DS (1978b) Gazetteer of India, Arunachal Pradesh, Lohit District
Chowdhury JN (1983) Arunachal Pradesh: from frontier tracts to Union Territory. Cosmo Publication, New Delhi
Cooper TT (1873) The Mishmi Hills; an account of a journey made in an attempt to penetrate Tibet from Assam to open new routes for commerce. H S King & Co, London
Cooper TT (1907) Frontier and overseas expedition from India. Govt. Monotype Press, Simla
Crooke W (1907) Natives of Northern India. Reprint 1973, Omsons Publication, Delhi
Cunningham A (1854) Ladakh: physical, statistical and historical. W H Allen, London

D

Dagli V (ed) (1971) Natural resources in Indian economy, Series: Commerce and economic studies 7. Vora & Co Publishers, Bombay
Dalton ET (1851) Notes on Mahapurushiyas as a Sect of Vaishnavas in Assam. J Asiatic Soc Bengal 20:455–469
Dalton ET (1872) Descriptive ethnology of Bengal. Asiatic Society of Bengal Press, Calcutta, (1973) Reprinted as 'Tribal history of Eastern India' by Cosmo Publication, Delhi
Damant GH (1880) Notes on the localitiy and population of the tribes dwelling between Brahmaputra and Ningthi rivers. JRAS 12:228–259
Danda D (1989) The Dimasa Kachari of Assam. Concept Publishing, New Delhi
Danda DG, Danda AK (2004) On Dimasa descent system. In: Basu A et al (eds) Anthropology for North-East India: a reader. Special Publication of the Indian National Confederation & Academy of Anthropologists, Kolkata, pp 140–151
Dani AH (1960) Archaeology and protohistory of Eastern India. Firma L Mukhopadhyay, Calcutta
Das AN (1945) Sankardeva: a study. Gauhati, p 147
Das BM (1960) Somatic variation among the hills and plains Garos of Assam. Man India 42:2
Das HP (1970) Geography of Assam. NBT, New Delhi
Das BM (1978) Variation in the physical characteristics of the Khasi population of Northeast India. Dutta Barua & Co, Gauhati
Das BM (1979) On some aspects of variation and ongoing human evolution. Man India 59(1):1–25
Das SK (1980) Demographic transformation of Assam. Econ Polit Wkly 15(19, May 10)
Das AK (1981a) Assam's agony. Lancers Publishers, New Delhi
Das BM (1981b) Microrevolution. Concept Publishing Co., Delhi
Das NK (1982) The Naga movements. In: Singh KS (ed) Tribal movement in India, vol I. Manohar, Delhi, pp 41–43
Das MM (1984) Peasant agriculture in Assam. Inter-India Publications, New Delhi
Das BM (1987) The people of Assam. Gyan Publishing House, Delhi
Das NK (1989) Ethnic identity, ethnicity and social stratification in North-East India. Inter-India Publications, New Delhi
Das A (1992) Tripura – Mizoram: an overview. GSI-Rec 125(pt. IV):43
Das NK (1994a) Ethno-historical processes and ethnicity in North-East India. J Anthropol Soc 29(1–2):3–35
Das SK (1994b) ULFA: United liberation front of Assam: a political analysis. Ajanta Publications, Delhi
Das MM (1995) Land holding structure: a problem in peasant agriculture in Assam. Konark Publishers, New Delhi
Das G (2001a) Trade between North-East region and Bangladesh; nature, trends and implications for development cooperation. Dialogue 2(4):79–91
Das NK (2001b) Regionalism and ethnicity in the North-East. J Anthropol Surv India 50:1–16
Das BM (2004a) Northeast India and its people. In: Basu A et al (eds) Anthropology for North-east India: a reader. Special Publication of the Indian National Confederation and Academy of Anthropologists, Kolkata, pp 1–15
Das NK (2004b) Regionalism, ethnicity and nationalism in North-East India. In: Basu A et al (eds) Anthropology for North-east India: a reader. Special Publication of the Indian National Confederation and Academy of Anthropologists, Kolkata, pp 39–72
Das NK (2008) Ethnic elements in North-East India. In: Sengupta S (ed) Peoples of North-East India. Anthropological perspectives. Gyan Publishing House, New Delhi
Das Gupta AB (1977) Geology of Assam – Arakan region. Quart J Geol Min Met Soc India 49:1–54
Das Gupta BK (2004) Distribution of traditional crafts in Khasi and Jaintia Hills: geographical and cultural factors. In Basu A et al (eds) Anthropology for North-east India: a reader. Special Publication of the Indian National Confederation and Academy of Anthropologists, Kolkata
Das Gupta AB, Biswas AK (2000) Geology of Assam. GSI, Bangalore

Das G, Purkayastha RK (eds) (2000) Border trade; Northeast India and neighbouring centres. Akanksha Publishing House, New Delhi
Dasgupta HC (1913) On two shouldered stone implements from Assam. J Asiatic Soc Bengal 14:291–293
Dasgupta S (1984) Tectonic trends in Surma Basin and possible genesis of folded belt. GSI Rec 113(IV):58–62
Dasgupta J (1998) Community, ethnicity & autonomy, insurgence and institutional development. In: Basu A, Kohli A (eds) Community conflicts and the State in India. OUP, New Delhi
Davis AW (1892) Census of Assam 1891, vol I. Assam Secretariat, Shillong
Deb DB (1960) Forest types studies in Manipur. Indian For 86(29):94–111
Debbarma K (2002) Internationally displaced persons in Tripura. In: Joshua Thomas C (ed) Dimension of displaced people in North-East India. Regency Publications, Delhi
Debbarma C (2006) Glory of Tripura civilisation. Parual Prakshani, Agartala
Deb-Barman D (1983a) Treatise on the traditional social institutions of Tripuri community. Directorate of Research, Department of Welfare of Scheduled Castes and Scheduled Tribes, Govt. of Tripura, Agartala
Deb-Barman SBK (1983b) The tribes of Tripura. Directorate of Research, Tripura
Dena Lal (ed) (1991) History of modern Manipur (1826–1949). Orbit Publishers, New Delhi
Dena Lal (1999) The Kuki-Naga conflict juxtaposed in the colonial context. In: Aggarwal KS (ed) Dynamics of identity and intergroup relations in North-East India. IIAS, Simla, pp 183–187
Dev BJ, Lahiri DK (1987) Manipur: culture and politics. Mittal Publications, Delhi
Dikshit KR (2011) McMahon line: its background and cartographic mismanagement during the 1962 war. Indian Cartogr 31:59–72
Dikshit KR, Dikshit JK (2004) Shifting cultivation studies in India: a review. Man Environ 29(2):37–69
Dixon RB (1922) The Khasis and the racial history of Assam. Man India 2:1–11
DONER-Ministry of Development of North-East Region, 2004, Annual report, 2003–04, Govt. of India
Downs FS (1969) The mighty works of god: a brief history of the Baptist Churches in North-East India. Christian Literature Centre, Gauhati
Dubey SM (1972) Education, social change and political consciousness among the tribes in North-East India. In: Singh KS (ed) The tribal situation in India. IIAS, Shimla, pp 280–293
Dubey SM (ed) (1978) North-East India: a sociological study. Concept, Delhi
Dubey SM (1980) The Assam movement: a preliminary study in the sociology of politics and development. Man Dev 2(3):60–75
Dunn EW (1886) Gazetteer of Manipur. Manas Publication, Delhi, Reprinted 1992
Dutt KN (1979) Assam District Gazetteer: Karbi Anglong and North Cachar Hills. Govt. of Assam, Gauwahati
Dutt KN, NC Dutta (ed) (1976) Gazetteer of Lakhimpur and Dibrugarh. Assam State Gazetteers. Govt. of Assam, Gauhati
Dutta SK (1952) Forests of Tripura. Indian For 78:68–80
Dutta P (1959) The Tangsas of the Namchuk and Tirap Valley. NEFA Administration, Shillong
Dutta NC (1968) Land problems land and reforms in Assam. S. Chand, New Delhi
Dutta NC (1978) Gazetteer of India – Assam State, Darrang District. Govt. of Assam, Guwahati
Dutta NC (ed) (1979) Agriculture in the hills, a case study of Meghalaya. NEICSSR, Shillong
Dutta PS (ed) (1990) Ethnic movements in polycultural Assam. Har-Anand Publications, New Delhi
Dutta Choudhury S (ed) (1980) Gazetteer of India – Arunachal Pradesh, Tirap District. Govt. of Arunachal Pradesh, Shillong
Dutta Ray B (ed) (1978) Socio-economic profile of Northeast India. B.R. Publishing, Delhi
Dutta TK, Saikia MM (1983) Plate tectonics model in the programme of mineral exploration – a proposition with reference to Northeast India. GSI Misc Publ No. 43, Proceedings of the symposium on geology and mineral resources of NE Himalayas, pp 119–29

E

Elwin V (1958) Myths of North-East Frontier of India. NEFA Administration, Shillong
Elwin V (1959a) India's North-East frontier in the nineteenth century. OUP, Bombay
Elwin V (1959b) The philosophy for NEFA (North-East Frontier Agency), Shillong
Elwin V (1961) Nagaland. NEFA Administration, Shillong
Elwin V (1964) The tribal world of Verrier Elwin: an autobiography. Oxford University Press, New York
Elwin V (1965) Democracy in NEFA. NEFA Administration, Shillong
Elwin V (1969) The Nagas in the 19th century. Oxford University Press, London
Endle, S (rev) (1961) The Kacharis. Macmillan, London. Reprinted by Cosmo Publication
Evans P (1932) Tertiary succession in Assam. Trans Min Geol Inst India 27(3):155–160
Evans P (1964) Tectonic framework of Assam. J GSI 5:80–96

F

Fisher RH (1963) The Himalayan battle ground. Pall Mall Press, London
von Fürer-Haimendorf C (1939) The naked Nagas. Macmillan, London
von Fürer-Haimendorf C (1946a) Agriculture and land tenure among the Apatanis. Man India 26(1):20–49
von Fürer-Haimendorf C (1946b) The naked Nagas head-hunters of Assam in peace and war. Thacker, Spink & Co, Calcutta
von Fürer-Haimendorf C (1955) Himalayan barbary. Murray, London
von Fürer-Haimendorf C (1962) The Appatanis and their neighbours. Routledge Kegan Paul, London
von Fürer-Haimendorf C (1969) Konyak Nagas. Holt, Rinehart & Winston, London
Furness WH (1902) The ethnography of Nagas of eastern Assam. J Anthropol Inst 32:445–466

G

Gait EA (1898) Human sacrifices in Assam. J Asiatic Soc Bengal 7:56–65
Gait EA (1902) The lower provinces of Bengal and their feudatories. Census of India 1901, vol VI-B, pt. III, p 15
Gait EA (1906) A history of Assam. Thacker Spink, Calcutta. Reprinted 2006, LBS, Guwahati
Gait EA (2006) The history of Assam. LBS, Guwahati. Reprinted from Gait EA (1926) History of Assam, 2nd edn. Thacker, Spink & Co., Calcutta
Gamble JS (1881) Manual of Indian timber: a summary of 906 species of timber, their rate of growth and other matters. Reprint 2002, Dehradun 2nd edn, Flora of British India
Ganguli JB (1968) Economic problems of the jhumias of Tripura. Bookland, Calcutta
Ganguly S (1975) Tectonic evolution of the Mizo Hills. Bull Geol Min Met Soc India 48:28–40
Ganju JL (1975) Geology of Mizoram. Bull Geol Min Met Soc India 48:17–26
Gassah LS (ed) (1984) Garo Hills: land and people. Omsons Publications, New Delhi
Geological Survey of India (1989) Recent advances in the study of Tertiary stratigraphy of Northeast India: a critical resume. GSI Spl Publ 3:1–23
Geological Survey of India (2000) Seismotectonics Atlas of India. GSI, Calcutta
Ghosh BB (1980) History of Nagaland. S. Chand & Co, New Delhi

Ghosh SP (1984a) Horticulture in North-Eastern India. Associated Publishing Co., New Delhi
Ghosh S (1984b) Problems of correlation of the pre-Gondwana rock units of Arunachal Pradesh and adjoining areas, a review. GSI Rec 113(4):15–23
Ghosh A (ed) (1989) An encyclopaedia of Indian archaeology, vol 2. Munshiram Manohardas, Delhi
Ghosh P (2003) Ethnicity versus nationalism. Sage Publication, New Delhi
Ghosh GK, Ghosh S (1997) Women of Manipur. APH Publishing Co, Delhi
Ghosh AK, Tiwari KK (1984) Faunal resources of North-East India. In: Tripathi RS (ed) Resource potential of North-East India, vol II, Living resources. Meghalaya Science Society, Shillong
Godbole M (2000) Task Force Report about the number of illegal Bangladeshi immigrants in India. Quoted by Prakash Singh, former DGP, Assam. In: Kumar BB (2006) Illegal migration from Bangladesh, p 78
Godden GM (1897) Nagas and the frontier tribes of North-East India. J R Anthropol Inst 26:161–201
Godwin-Austin HH (1872) Evidence of past glacial action in the Naga Hills. J Asiatic Soc Bengal 17(3):203–213
Godwin-Austin HH (1875a) On the rude monuments of certain Naga tribes with some remarks on their customs. J R Anthropol Inst G B Irel 4:144–147
Godwin-Austin HH (1875b) A celt found at the Khasi Hills, Shillong. In: Proceedings of the Asiatic Society of Bengal. Shillong, pp 158–59
Gogoi L (1971) The Tai Khamptis, Chowkham. Dibrugarh
Gohain H (1980) Assam: tangle jarganised. Econ Polit Wkly 15(329):1337–1338
Gopalakrishnan R (1995) Meghalaya: land and its people. Omsons Publications, New Delhi
Gopalakrishnan R (2000) Assam: land and people. Omsons Publications, New Delhi
Gorman C (1971) The Hoabinhian and after. Subsistence pattern in Southeast Asia during the late Pleistocene and early recent period. World Archaeol 2:300–320
Goswami BB (1979) The Mizo unrest. Alok Publishers, Jaipur
Goswami A (1984a) Tribal development with special reference to Northeast India. Social Sci 12(8)
Goswami PC (1984b) The migration of Bengali Muslims. In: Abbi BL (ed) North-eastern region: problems and prospects of development. CRRID, Chandigarh
Goswami DC (1988a) Fluvial regime and flood hydrology of the Brahmaputra River, Assam. In: Kale VS (ed) Flood studies in India. Geological Society of India, Memoir 41. Geological Survey of India, Bangalore, pp 53–75
Goswami PC (1988b) The economic development of Assam. Kalyani Publishers, New Delhi
Goswami PC (ed) (1989) Agriculture in Assam. Assam Institute of Development Studies, Guwahati
Goswami P (1990) Assam in the nineteenth century: industrial and colonial penetration. Spectrum, Guwahati
Goswami NR (1996) Analysis of trends in operational holdings in Arunachal Pradesh. Agro-Economic Research Centre, Assam Agricultural University, Jorhat
Goswami A (ed) (2002) Traditional governing institutions among the hill tribes of the North-East India. Akanksha Publishing House, New Delhi
Goswami P (2007a) Colonial Assam – trade, development and dependence. Lecture series, Lecture VI, ICHR NE Regional Centre, Guwahati
Goswami SD (2007b) Agrarian change and social tension in post 1857 Assam. In: Goswami P (ed) Changing pattern of economy and society – 19th and 20th century North-East India. Dept. of History, Gauhati University, Gauhati
Goswami DC Flood forecasting in the Brahmaputra river, India. A case study, http://www.southasianfloods.org/document/ffb/index html (downloaded on 9 June 2007)
Goswami MC, Bhagabati AC (1959a) A preliminary report on the collection of tool types from West Assam. Man India 39(4):312–314
Goswami MC, Bhagabati AC (1959b) A typological study of shouldered celt from Rengchangiri (Garo Hills). J Univ Gauhati 10(2):105–122

Goswami MC, Majumdar DN (1971) Social institutions of the Garos of Meghalaya: an anthropological analysis. Nabbharat, Calcutta
Goswami MC, Majumdar DN (1972) A typological study on some pre-historic tools from Kameng District, NEFA, (Arunachal). J Assam Sci Soc 15(1):125–135
Goswami MC, Majumdar DN (2004) Clan organization among the Garo of Assam. In: Basu A et al (eds) Anthropology for North-east India: a reader. Special Publication of the Indian National Confederation & Academy of Anthropologists, Kolkata, pp 129–39
Goswami MC, Sharma TC (1962a) A brief report on the on the investigation into pre-historic archaeology of North Cachar Hills, Assam. J Univ Gauhati 13:63–66
Goswami MC, Sharma TC (1962b) On the Neolithic from the Garo Hills, Assam. J Univ Gauhati 13(2):67–73
Goswami MC, Sharma TC (1963) Further report on the investigations into the pre-historic archaeology of N. Cachar Hills, Assam. J Univ Gauhati 14(2):45–47
Govt. of Arunachal Pradesh (2003) Statistical abstract of Arunachal Pradesh 2003. Directorate of Economics and Statistics, Itanagar
Govt. of Assam (1966–1967) Basic statistics relating to Assam's economy, 1953–56 to 1966–67. Department of Economics & Statistics
Govt. of Assam (1981) Economic survey, Assam, 1980-81. Directorate of Economics and Statistics, Guwahati
Govt. of Assam (2006) Statistical handbook, Assam, 2006. Directorate of Economics and Statistics, Guwahati
Government of India (1965) NEFA. Publication Division, New Delhi
Government of India, Central Forestry Commission (2005) State of the forests report
Government of Manipur (2001) Statistical abstracts of Manipur 2001. Directorate of Economics and Statistics, Imphal
Govt. of Meghalaya (1988) Area, production and yield of principal crops in Meghalaya (1970-71 to 1986-87). Directorate of Economics and Statistics, Shillong
Govt. of Meghalaya (2000) Area, production and yield of principal crops in Meghalaya (1987-88 to 1998-99), vol II. Directorate of Economics and Statistics, Shillong
Govt. of Mizoram (1997) State report of agricultural census 1995-96. Directorate of Economics and Statistics, Aizawl
Govt. of Nagaland (1987, 2003, 2005) Statistical handbook of Nagaland. Directorate of Economics & Statistics, Kohima
Govt. of Nagaland (2004) Estimates of state domestic product of Nagaland from 1993-94 to 2001-02. Directorate of Economics and Statistics, Kohima
Govt. of Tripura (2006) Economic review of Tripura 2005–2006. Directorate of Economics and Statistics, Agartala
Govt. of Tripura (2007) Some basic statistics of Tripura 2006. Directorate of Economics and Statistics, Planning (Statistics) Department, Imphal
Govt. of Mizoram (2002a) Socio-economic review Mizoram 2000–2001. Directorate of Economics and Statistics, Aizawl
Govt. of Mizoram (2002b) Statistical handbook of Mizoram. Directorate of Economics and Statistics, Aizawl
Grange Lt GR (1839) Narrative of an expedition into the Naga territory of Assam. J Asiatic Soc Bengal 8:445–470
Grierson GA (1905) Linguistic survey of India, vols 2 and 3, pt. 1,2, and 3 – Tibeto-Burman Family, Bodo, Naga & Kachari groups, Govt. Publication, Calcutta, Reprinted 1967 by Motilal Banarsidass, Delhi
Guha BS (1931) The racial affinities of the people of India. Census of India, vol 1-India, pt. III, Ethnographical, Govt. Press, Simla
Guha A (1977) Planter Raj to Swaraj: freedom struggle and electoral politics in Assam 1826–1947. ICHR, New Delhi

Guha A (1978) Immigrants and autochthones in a plural society: their interrelations in the Brahmaputra valley in historical perspective. In: Dubey SM (ed) Northeast India: a sociological study. Concept, Delhi, pp 43–53
Guha A (1979) Assamese peasant society in the late nineteenth century: structure and trend. Occasional papers No. 25, ICSSR, CSSSC, Calcutta
Guha A (1980) Little nationalism turned chauvinist: Assam's Anti-foreigner upsurge 1979–1980. Econ Polit Wkly XI, Special Number Nos. 41, 42 & 43, Oct.:1699–1720 Rebuttals
Guha A (1991) Medieval and early colonial Assam: society, polity and economy. CSSSC, K.P. Bagchi & Co, Calcutta
Gundevia YD (1975) War and peace in Nagaland. Palit & Palit, Dehradun
Gupta HK (1974) Some seismological observations and tectonics from Hindu Kush to Burma Region. Himal Geol 4(I):465–480
Gupta AK (2008) Biodiversity and wildlife research in Northeast India. New Initiatives by the Wildlife Institute of India, Ch. 18.2. Spectrum Publications, Guwahati
Gurdon (Lt. Col.) PTR (1914) The Khasis. Macmillan, London. Reprint 1975, Cosmo Publications, New Delhi
Guruswami M, Abraham RJ (2010) Left behind: a case study of Assam. Centre for Policy Alternatives, New Delhi
Guwahati J (1844) Notes on the NagaTribes in communication with Assam. Calcutta, pp 26–27

H

Halliday HI (1928) The Abors of Assam. United Empire, vol 19
Hamilton F (1807) see Buchanan-Hamilton
Hamilton W (1828) East India Gazetteer, vol 2. Parbury, Allen & Co, London
Handique GK, Sethi AK, Sharma SC (1989) Review of tertiary stratigraphy of Northeast India. A critical resume. GSI Spl Pub 23:1–23
Haokip TT (1995) The Kuki chiefship and its changing dimension. Unpublished dissertation, NEHU, Shillong
Hazarika S (1994) Strangers of the mist. Tales of war and peace from India's North-East. Penguin Books, New Delhi
Hazarika I (1996) Geopolitics of North-East India. Gyan Publishers, New Delhi
Hazarika N (2005) Ethnic autonomy question in North-East India. Search for an answer. Spectrum Publications, Guwahati
Hazarika S (2000) Rites of passage, border crossings, imagined homelands, India's East and Bangladesh. Penguin, New Delhi
Hazarika S (2006) Illegal migration from Bangladesh: problem and long-term perspective. In: Kumar BB (ed) Illegal migration from Bangladesh. Concept, Delhi
Hazarika S (2008) Writings on the wall: reflections on the North-East. Penguin, New Delhi
Hazarika R, Saikia A (2009) Land use and fragmentation in Karbi –Anglong, Assam. In: Bhagabati et al (eds) Areas of concern: geographical status of selected problem areas of Assam. Geography Dept., Gauhati University, Guwahati
Hegde SN (1984) Orchids of Arunachal Pradesh. Arunachal Pradesh Forest Department, Itanagar, quoted from Chakrabarti, Syamali op.cit
Hitson JPT (2004) Politics of ethnicity in North East India with special reference to Manipur. Regency Publication, New Delhi
Hodgson B (1847) First essay on the Kocch, Bodo and Dimal tribes. Reprint Kessinger Publishing, Calcutta
Hodson TC (1906) Genna amongst the tribes of Assam. J Anthropol Inst 36:92–103

Hodson TC (1908) The Meitheis. Macmillan, London. Reprint 1975, B. R. Publishing Corporation, Delhi
Hodson TC (1911) The Naga tribes of Manipur. Macmillan, London. Reprint 1996, Low Price Publications, Delhi
Holdich T (1956) Political frontiers and boundary making. Macmillan, London
Horam M (ed) (2000) The rising Manipur. Manas Publications, New Delhi
Hunter WW (1876) Statistical account of Hill Tipper. In: Statistical Account of Bengal, vol.VI, p 507
Hunter WW (1879) A Statistical account of Assam. Trubner & Co., London, vols 1 and 2 (Distts of Kamrup, Darrang, Nowgong; Sibsagar & Lakhimpur), reprinted by Spectrum publications, Guwahati
Hunter WW (1881) Imperial Gazetteer of India, vol IV. Trubner & Co., London
Hutton JH (1921a) The Angami Nagas with some notes on neighbouring tribes. Macmillan & Co., London, Reprinted OUP
Hutton JH (1921b) The Sema Nagas. Macmillan, London
Hutton JH (1922) The meaning of erection of monoliths by Naga Tribes. J R Anthropol Inst 52:69
Hutton JH (1923) Carved monoliths at Jamuguri in Assam. J R Anthropol Inst 53:150–159
Hutton JH (1924) Two celts from Naga Hills. Man 24(15):20–22, London
Hutton JH (1926a) The use of stone in Naga Hills. J Royal Anthropol Inst 56:71–82
Hutton JH (1926b) A Naga Hills celt. J Royal Asiatic Soc Bengal 22:133
Hutton JH (1928a) Pre-history of Assam. Man India 8(4):228–232
Hutton JH (1928b) The significance of head hunting in Assam. J R Anthropol Inst 58:399–407
Hutton JH (1931) Linguistic prehistory. In: Census of India, 1931, vol 1, pt. 1, Report pp 357–69
Hutton JH (1946) Problems of reconstruction in the Assam Hills. Man India 26:97–109

I

IMD (India Meteorological Department) (1962) Monthly and annual rainfall and number of rainy days based on records from 1901–1950, Memoirs IMD, vol XXXI, pt. III, Assam, West Bengal, Orissa & Bihar
IMD (1981) Basin hydrometry. Monograph no. 9 A study in trends and periodicities of rainfall, over Brahmaputra catchment, p 14
IMD (1985) Climatological tables of observations from India (1931–61)
IMD (2001) Earthquakes and safety measures, p 5. (a pamphlet)
Imperial Gazetteer of India (1907a) The empire, vol 3, economy. Clarendon Press, Oxford
Imperial Gazetteer of India (1907b) Assam. vol 6:14–121, includes agriculture. Clarendon, London

J

Jain SK (1985) Conservation of orchids in India. In: Chadha KL, Singh H (eds) Progress in Orchid research. IIHR/UNDP, Bangalore
Janardhan K, Gohain BN (1991) Quaternary geology and geomorphology of Brahmaputra valley in parts of Marigaon and Nagaon districts, Assam. GSI Rec 124(pt. IV):41–44

Johnstone, James (Sir) (Major Gen.) (1896) My experiences in Manipur and Naga Hills. London. Reprint 1983, Cultural Publication House
Joppen CSJ (1907) Historical atlas of India. Longman, Greens & Co, London
Joshi SC (2002) Manipur: the jewel of India. Akansha Publishing House, New Delhi
Joshi RC, Rawat AS (2004) Morphotectonic observations: a case study from the outer Eastern Himalaya along main boundary thrust in between Ranga and Dikrong River, Arunachal Pradesh. Arunachal Univ Res J 7(2):35–46

K

Kabui G (1991) History of Manipur – pre colonial, vol 1. NBH, New Delhi
Kachroo K (1990) Study of the geo-environmental parameters in the Barak Basin. GSI Rec 123(4):94–95
Kakati B (1972) Assamese, its formation and development, 3rd edn. Lawyer's Book Stall, Guwahati
Kalita GC (2003) Changing socio-economic characteristics of Pathsala town. M.Phil. dissertation, Gauhati University
Kar PC (1982) The Garos in transition. Cosmos Publications, New Delhi
Kar BK (2001) Population (of Assam). In: Bhagabati AK, Bora A, Kar BK (eds) Geography of Assam. Rajesh Publications, Delhi
Kar KK, Barua G (1979) Tea labour: preliminary appraisal of common identity in multi-ethnic community in Assam. Man India 59(1):33–42
Karna MN (ed) (1998) Social movement in North-East India. Indus Publishing Co, New Delhi
Karna MN (2005) Meghalaya. In: Mayumi Murazava, Kyoko Inoue and Sanjoy Hazarika (eds) Subregional relations in the Eastern South Asia with special Focus on India's North-Eastern Region, Tokyo, pp 243–276
Kashyap SG (2012) Flood of struggles. Indian Express, Guwahati, July 1, 2012
Kayal JR, Arefiev SS, Barua S, Hazarika D, Gogoi N, Kumar A, Chowdhury SN, Kalita S (2006) Shillong Plateau earthquakes in Northeast India region. Complex tectonic model. Curr Sci 91(1):109–113
Keivom L (1992) Zoram Khawvel – I (The World of Zoram – Mizo). M.C. Lalrinthanga, Aizawl
Khobung L (1955) Trans-border migration and political conflicts: a case study of Chakmas. M.A. dissertation, Jawaharlal Nehru University
KingdonWard F (1940) Botanical and geographical exploration in the Assam Himalayas. Geogr J 96(1):1–13
KingdonWard F (1941) Assam adventure. Jonathan Cape, London
KingdonWard F (1953) Assam earthquake of 1950. Geogr J 119:169–182
Krishnan MS (1960) Geology of India and Burma. Higginbothams, Madras
Kshetri R (2006) The emergence of Meitei nationalism. Mittal Publications, New Delhi
Kuhn E (1889) Beiträge zur Sprachenkunde Hinterindiens. Sitzungsberichte d. k. bayr. Akademie d. Wissenschaften, pilosoph. philol. Cl. part 2 190–236, Munich
Kumar BB (1996) Reorganisation of North-East India. Omsons Publications, New Delhi
Kumar G (1997) Geology of Arunachal Pradesh. GSI, Bangalore
Kumar BB (2006) Illegal migration from Bangladesh. Concept, New Delhi
Kumar A, Singh B (2008) Measurements of active deformation by installation of 3D fault deformeter in Manipur. Indian Landslides 1(1):37–39
Kumar MN, Bose J, Roy RK (1983) Geomorphology and Quaternary geology of Dikrong Basin, Subansiri District, Arunachal Pradesh, with special reference to the hydrological characteristics of alluvial sediments. In: Proceedings of the symposium on geology and mineral resources of Northeastern Himalayas 1976, GSI Misc Publ 43, Calcutta, pp 77–81

Kumar Y, Syiemlieh HJ, Singh S (2008) Vegetation cover and plant species of degraded landscape in the extremely wet Cherrapunji area. Trans Inst Indian Geogr 30(2):111–124
Kunte SV, Ganju JL, Dutta NK (1983) Geology and structure of the Tertiary belt between Bargang and Pachin Rivers, Arunachal Pradesh. GSI Spl Publ 43:124
Kyndiah PR (1990) Meghalaya: yesterday and today. Har-Anand Publications, New Delhi
Kyndiah PR (1994) Mizo freedom fighters. Sanchar Publishing House, Delhi
Kyoko Ionue (2005) Integration of North-east: the state formation process. In: Murayama M, Kyoko Inoue, Hazarika S (eds) Sub-Regional relations in the Eastern South Asia – with special focus on India's North Eastern region: Research programme series No. 133, IDE-JETRO

L

Lahiri N (1991) Pre-Ahom Assam. Munshiram Manoharlal Publishers, New Delhi, p 179
Lakshmi D (1968) Ahom tribal relations: a political study. Assam Book Depot, Calcutta, 250 p
Lalkhama (2006) A Mizo civil servant's random reflections. Express Print House, Ghaziabad
Lalmunmawia F, Khawlhring N (2011) Cultivation of anthurium in Mizoram, India: present scenario and future prospect. Sci Vis 11(4):203–207
Lalthangliana B (2000) Mizo history before 1900. Aizawl
Lalthangliana B (2001) The history of Mizos in India, Burma and Bangladesh. Remkungi, Aizawl
Lambert ETD (1937) From the Brahmaputra to the Chindwin. Geogr J 89:18 p, London
Lamin H (1995) Economy and society in Meghalaya; changing pattern of a Pnar village. Har-Anand Publications, New Delhi
Lewin TH (1870) Wild races of eastern frontier of India. Mittal Publications, New Delhi
Li, Tich-Tsang (1956) The historical status of Tibet. King's Crown Press, New York
Lloyd GT (1923) Census of India 1921, vol III, Assam. Assam Secretariat Press, Shillong
Luna RK (2005) Plantation trees. International Book Publishers, Dehradun
Luthra PN (1971) Constitutional and administrative growth of the NEFA. DIPR, NEFA, Shillong
Lyall CJ (1883) Report on the census of Assam. Printing Press, Calcutta
Lyall C (1908) The Mikirs (From the papers of the late Edward Stack, IES, edited and arranged and supplemented) H.H.Wilson, London. Reprint United Publishers, Guwahati

M

Mackenzie A (1979, 2005) North-East Frontier of India. Mittal Publications, New Delhi. Reprinted from 1884 edition entitled 'History of the relations of the government with the hill tribes of the North-East Frontier of Bengal'. Home Department Press, Calcutta
Mackenzie A (1884) History of the relations of the Government with the tribes of North-East Bengal. Calcutta, Reprinted (2005) as 'North-East frontiers of India'. Mittal Publication, Delhi
Mahajan VS (ed) (1987) Emerging pattern of North East economy. Deep & Deep Publications, New Delhi
Majumdar DN (1965) Races and culture of India. APH, Bombay
Majumdar DN (1978) Culture change in two Garo villages. Anthropological Survey of India, Calcutta
Mallick LK (1984) Seismological set-up of Northeast India. In: Tripathi RS (ed) Resource potential of Northeast India, vol 2. Meghalaya Science Society, Shillong, pp 7–21
Mandal H, Mukherjee S, Datta A (2002) India. An illustrated atlas of tribal world. ASI, Kolkata

Mankekar DR (1967) On the slippery slopes of Nagaland. Manaktales, Bombay
Marak PR (2005) The Garo tribal religion: beliefs and practices. Anshah Publishing House, Delhi
Mather LP, Evans P (1964) Oil in India. I.G.C. 22nd session, India
Mathew T (ed) (1983) North-East hill regions of India, problems and prospects of development. Agricole Publications, New Delhi
McSwiney J (1912) Census of India 1911, vol III, pt. I, Report, Assam. Assam Secretariat Press, Shillong
Medhi DK (1977) Some aspects of Quaternary studies in the Garo Hills, Meghalaya. Bull Deccan Coll PG Res Inst 34(1–4)1977-78:71–78, Pune
Medhi DK (1980) Quaternary history of Garo Hills. Unpublished Ph.D. thesis, University of Pune
Medhi DK (1983) The Garos and their material culture – a study based on ethno-archaeological approach. Man Environ 7:70–77, Pune
Medhi DK (1990) Pre-history of Assam. Asian Perspect 29(1)37–44, University of Hawai, Honolulu
Medhi RP, Chakrabarti S (2009) Traditional knowledge of north-east people on conservation of wild orchids. Indian J Tradit Knowl 8(1):11–16
Medhi DK, Rajguru SN (1977) Discoveries in Assam. Indian Archaeology – a review, 1977–78. New Delhi
Medlicot HB (1875) A stone hatchet from Dibrugarh, upper Assam. Proceedings ASB, p 159
Mehra P (1976) The McMahon line and after: a study of the triangular contest on India's North-eastern frontier between Britain, China and Tibet 1904–47. MacMillan
Mehra P (1979) The North-Eastern frontier: a documentary study of the internecine rivalry between India, Tibet and China. OUP, Delhi
Mehra P (2005) Younghusband's expedition to Lhasa: an interpretation. Gyan Publishing House, Delhi
Memorandum of the Census of India, London 1871–72, Her Majesty's Stationary Office, London 1875
Menon KD (1975) Tripura district gazetteer. Govt. of India, Agartala
Michell HJ (1928) Report on the Naga Hills (Upper Chindwin) expedition for the abolition of human sacrifice, Jan–March, 1928. Govt. of Burma Press
Mills JP (1922) The Lotha Nagas. Reprinted 1980, Directorate of Art & Culture, Government of Nagaland, Kohima
Mills JP (1926) The Ao Nagas. Macmillan, London. Reprinted 2003, Nagaland Directorate of Art & Culture, Kohima
Mills JP (1937) The Rengma Nagas. Macmillan, London. Reprinted 1982, Nagaland Directorate of Art & Culture, Kohima
Mills JP, Hutton JH (1929) Ancient monolith of North Cachar. J Asiatic Soc Bengal 25:295–296
Ministry of Health and Child Development Govt. of India (2009) National Health Profile 2009
Mipun BS (1997) Immigrants and agricultural changes in the Lower Brahmaputra valley: a case study of Darrang district. Ph.D. dissertation, NEHU, Shillong
Miri S (1993) Communalism in Assam: a civilizational approach. Har-Anand Publication, New Delhi
Mishra MS (1998) Rural development in Eastern and North-Eastern India. IIM, Calcutta
Misra U (1978) The Naga national question. Econ Polit Wkly 13(4):618–624
Misra T (1980a) Assam: a colonial hinterland. Econ Polit Wkly 15(32):1357–1364
Misra U (1980b) Fresh tension in Upper Assam tea belt. Econ Polit Wkly 15(3):1301
Misra U (1981) Little nationalist turned chauvinist. Econ Polit Wkly 16(8):290–292
Misra U (1984) The Assam movement and the Assamese national question. In: Abbi BL (ed) Northeast region: problems and prospects of development. Centre for Research in Rural and Industrial Development, Chandigarh
Misra T (1987) Literature and society in Assam: a study of the Assamese renaissance 1826–1926. Omsons Publication, Guwahati

Misra U (1988) Northeast India: quest for identity. (A collection of essays on socio-economic topics). Omsons Publications, Guwahati
Misra U (ed) (1991) Nation building and development in North-East India. Guwahati, Purbanchal Prakash
Misra U (2000) The periphery strikes back: challenges to the nation state in Assam and Nagaland. Centre of Advanced Study, Shimla
Misra U (2005) Assam. In: Mayumi Murayava et al (eds) Subregional relations in the Eastern South Asia with special focus on India's North-Eastern region. Research programme series No. 133, IDE-JETRO, 51–66
Misra U (2006) Historical aspects of the illegal migration from Bangladesh. In: Kumar BB (ed) Illegal migration from Bangladesh. Concept, New Delhi
Mohapatra AC, Panda B (2004) Disparity in literacy in Meghalaya. In: Suryakant et al (eds) Reinventing regional development. Rawat Publications, New Delhi, pp 347–376
Moorcroft W, Trebek G (1841) Travels in the Himalayan provinces of Hindustan and the Punjab, 1819–1825. London, new edition H. Hayman (1916), 2 vols, London
Mukerji B, Singh KS (1982) Tribal movement in Tripura. In: Singh KS (ed) Tribal movement in India, vol I. Manohar, Delhi
Mukherjee KN (1984) Exploration for coal with particular reference to tertiary coalfields of North-Eastern India. Rec GSI 113(pt. IV):1–14
Mullan MA (1931) Caste, tribe, race and nationality. Census of India, vol 3, Assam, pt. I, Report
Mullan CS (1932) Census of India 1931, vol III, Assam. pt. II, tables. Assam Secretariat Press, Shillong, Appendix to Chapt. XII, p 201
Murthy SV (1973) Vaisnavism of Sankardev and Ramanuja. Motilal Banarasidass
Murti SK, Joseph J (1984) Plant resources in Northeast India, vol II. Meghalaya Science Society, Shillong, pp 28–39

N

Nag S (2008) Pied pipers in North-East India. Manohar Publishers, New Delhi
Nair K (1961) Blossoms in the dust: the human element in Indian development. Gerald Duckworth, London
Namgain VD (1991) Arunachal Pradesh regional geology division: an overview. GSI Rec 124(4):1–5
Nandy DR (1972) Style of folding in the Mio-Pliocene of Tripura and Mizoram area and possible role of basement dislocation fabric. GSI Misc Publ 1:31
Nandy DR (1980) Tectonic patterns in Northeastern India. Indian J Earth Sci 7(1):103–107
Nandy DR (1983) The Eastern Himalayas and Indo-Burman orogen in relation to Indian plate movement. GSI Spl Publ 43:153–159
Nandy DR (2001) Geodynamics of Northeastern India and the adjoining region. ABC Publications, Kolkata
Nandy DR, Gupta DD, Sarkar K, Ganguly A (1983) Tectonic evolution of Tripura-Mizoram fold belt, Surma Basin, Northeastern India. Quart J Geol Min Met Soc India 55(4):186–194
Nath RM (1948) The background of Assamese culture. Mimosa Ridge, Nonghthymai/Shillong
Nath D (1989) History of Koch Kingdom C. 1515–1615. Mittal Publications, New Delhi
Nath D (ed) (2004) Reopening of Stilwell road: prospects and problems. Kolkata
National Council of Applied Economic Research (1967) Techno-economical survey of NEFA. Delhi
Natrajan N (1970) Mizos social institutional practices. Soc Welf 16(2)
Navlakha BB (2003) Naga peace process. Econ Polit Wkly, Feb 22

Nayak P (2009) Human development reports of North-East India: a bird's eye view. Placed at Munich Personal Pe PEc Archive
Nayak P (ed) (2010) Growth and human development in North-East India. OUP, New Delhi
Nayak DK, Patra A (2003) Ethnic conflict and forced migration in the areas of Bodo concentration in Assam, India. TIIG 25:30–48
NEC (2004) New hopes, new organisations. N.E. Council, Shillong
Needham JF, Simington A (1893) Report of the Hukong valley expedition. Shillong
Neog M (1963) Sankardeva and his times. Gauhati University
Neufville (Capt.) JB (1828) On the geography and population of Assam. Asiatic Res 16:331–360, Calcutta
Neville GA et al (1923) Notes on certain frontier tribes. In Census of India 1921, vol III, Assam, pt. I, Report, Appendix B. Shillong
Nibedon N (1983) The night of the guerillas. Lancers Publishers, Delhi
North-East Development Finance Corporation (NEDF): Data Bank for each N.-E. State
North-Eastern Council: Basic Statistics of North-East Region, 1977, 1982, 1992, 1995, 2000 and 2006. NEC, Secretariat, Ministry of Home Affairs, Govt. of India, Shillong
Nuh VK (1999) The Naga chronicle. CNBC, Kohima

O

O'Donnell CJ (1893) The lower provinces of Bengal and their feudatories, vol IV, Census of India 1891. Bengal Secretariat Press, Calcutta
O'Malley LSS (1912) Bengal, Bihar, Orissa and Sikkim, Census of India 1911, vol V, pt. I, Report
Oinam B (2003) Patterns of ethnic conflicts in the Northeast: a study of Manipur. Econ Polit Wkly 38(21, May 24):2031–2037
Oinam B (2005) Manipur. In Mayumi M et al (eds) Subregional relations in the Eastern South Asia with special focus on India's North-Eastern region, IDE-JETRO, pp 67–112
Okendro M, Kushwaha RAS (2008) Landslide incidences along part of NH 53, between Noney and Nungba, Manipur. Indian Landslides 1(1):41–44
Oldham T (1854) On the geological structure of parts of the Khasi Hills with observations on meteorology and ethnology of that district. F Carbery/Bengal Military Orphan Press, Calcutta
Oldham T (1859) On the geological structure of a portion of the Khasi Hills. Memoirs GSI 1:99–207
Olivier G (1958) Physical anthropology of the Nagas of Assam. Man India 38(2):105–110
Omvedt G (1980) Aspects of the Assamese problem. Frontier, June, 7, Calcutta
Owen J (1844) Notes on the Naga tribes in communication with Assam. Calcutta, pp 26–27

P

Pachuau L (1991) Population structure and settlement patterns in Mizoram. Unpublished Ph.D. dissertation, NEHU, Shillong
Pakem B (1990) Nationality, ethnicity and cultural identity. Omsons Publication, Guwahati
Pakem B (ed) (1993) Regionalism in India. Har Anand Publications, New Delhi
Pakrasi K (1950) A study of some Neolithic artefacts from Assam. J Univ Gauhati 7:1
Panda B, Mohapatra AC (2003) Disparity in literacy in the states of Arunachal Pradesh and Mizoram. In: Mohapatra AC, Pathak CR (eds) Economic liberalization and regional disparities in India: special focus on the North Eastern Region. Star Publishing House, Shillong, pp 193–198

Pargiter FE (1897) Ancient kingdoms in Eastern India. J Asiatic Soc Bengal 66:110
Parua PK (2003) Flood management in Ganga-Brahmaputra-Meghna basin: some aspects of regional co-operation. Civil Engineering Today 2003:68–75, ASCE-IS, Calcutta
Pascoe EH (1973) A manual of geology of India and Burma. GSI Publ 3:1345–2017
Paul CR (1961) Census of India 1961, vol 26, pt. VI, Village survey monograph, Village Kamalghat
Paul CR (1967) Census of India 1961, vol XXVI, Tripura, pt. I (i), general report
Peal SE (1893) On the Morong as possibly a relic of pre-marriage communion. J Anthropol Inst 22:244–261
Pemberton (Capt.) RB (1835) Report on the eastern frontier of British India. Gauhati. Reprint 1966, Mittal Publications, Delhi
Pettigrew RW (1909) Kathi Kashan, the Soul departure feast, as practiced by the Tangkhul Nagas, Manipur, Assam. J Asiatic Soc Bengal (NS) 5(2):37–46
Phadnis U (1989) Ethnicity and nation building in S. Asia. Sage Publications, New Delhi
Phukan U (1989) Agricultural development in Nagaland. Agro-Economic Centre for Northeast India, Assam Agricultural University, Jorhat
Phukan G, Dutta NL (eds) (1995) Politics of identity and nation building in North-East India. New Delhi
Planning Commission (1997) Transforming North-East, tackling backlogs in basic minimum services & infrastructure needs. Planning Commission, New Delhi
Playfair A (1909) The Garos. David Nutt, London
Poddar BC, Ramesh NR (1983) Spotlight on pre-history of Tripura. GSI (NER) News Lett 2(1):1–4
Porter AE (1933) Census of India 1931, vol 5, Bengal Sikkim, Report and Tables, Calcutta 1933
Prasad AR (1986) Coal industry of India. Ashish Publishing House, New Delhi
Prasad RN, Sharma UC (1994) Potential indigenous farming systems of the North-eastern Region. ICAR NE Hill Region, Barapani, Meghalaya, India
Pudaite LT (2005) Mizoram. In: Murayava M et al (eds) Sub-Regional relations in the Eastern South Asia with special focus on India's North-Eastern region. IDE-JETRO, Joint Research Program Series No. 133, pp 155–242
Puri GS (1960) Indian forest ecology. Oxford Book & Stationary Co, New Delhi

R

Rahman SM (ed) (1967) Gazetteer of India – Assam State, Sibsagar District (including Jorhat). Govt. of India, Shillong, pp 228–229
Rai RN (1981) Water management in North-Eastern Hill Region. Research Bulletin, ICAR Research Complex for NEH Region, Shillong
Rai B (1993) Demographic aggression against India. B. S. Publishers, Chandigarh
Rajkhowa S (1961a) Regeneration of Upper Assam Dipterocarpus-Mesua forests. Indian For 87(1)
Rajkhowa S (1961b) Forest types of Assam with special reference to the evergreen and semi-evergreen forests. Indian For 87(9):520–541
Raju AV (1993) Assam–Meghalaya geological mapping: an overview. GSI Rec 126:13
Rao SN (1973) The Neolithic culture of Sarutaru. Bull Dept Anthropol Dibrugarh Univ 2:1–9
Rao SN (1977) Excavation at Sarutaru: a Neolithic site in Assam. Man and Environment I:39–43, NEC Social Science Research, Shillong
Ray A (1993) Mizoram, India. Land & people series. NBT, New Delhi
Risley HH (1915) In: Crooke W (ed) People of India Memorial edn. Thacker Spink, Calcutta

Reid (Sir) Robert (1942) History of frontier areas bordering on Assam from 1883–1941. Assam Secretariat Press, Shillong
Reid (Sir) Robert (1946) Years of challenge in Bengal and Assam. Earnest Press, London
Roberts RH (2006) A grammar of the Khasi language. Delhi (first ed. 1891 Kegan Paul, London)
Robinson W (1841) A descriptive account of Assam with a sketch of the local geography and concise history of the tea plant in Assam. Ostell & Lepage, British Library, Calcutta
Rongumuthu DS (1960) The epic lore of the Garos. Gauhati University, Guwahati
Rowntree JB (1954) An introduction to the vegetation of Assam Valley. Indian For Rec (N S) 9(1):1–87
Roy Burman BK (1970) Demographic and socio-economic profile of the hill areas of North-East India. Census of India 1961, New Delhi
Roy N (ed) (1979) Khasi Heritage: a collection of essays on Khasi religion and culture. Seng Khasi, Shillong
Roy Burman BK (2004) Christianity and development among the hill tribes of North-East India. In: Basu A et al (eds) Anthropology for North-east India: a reader. Special Publication of the Indian National Confederation & Academy of Anthropologists, Kolkata, pp 73–87
Roy TK, Asthana MP (1989) Recent advances in the knowledge of stratigraphy of shelf areas and fold belt of Tripura in Assam-Arakan Basin. GSI Spl Publ 23:37–43
Roychoudhury NR (1977) Tripura through the ages. A short history of Tripura from earliest times to 1947 AD. Bureau of Research & Publication, Tripura, Agartala
Roychowdhury P (1986) The North-East: roots of insurgency. Firma KLM, Calcutta
Rustomji N (1973) Enchanted frontiers. OUP, Calcutta
Ryder (Maj.) CHD (1905) Exploration and survey with Tibet frontier commission and from Gyangtse to Simla, via Gartok. Geogr J 26(4):369–395

S

Sachdeva G (2000) India's North-East; rejuvenating a conflict driven economy. Faultline 6:79–103
Sachdeva G (2003) Fiscal governance in the North-East. Dialogue 15(4):53–64
Saha RK (2004) Ecology in time and space: structural transformation among the Meiteis of Manipur Valley. In: Basu A, Dasgupta BK, Sarkar J (eds) Anthropology for North-East India: a reader. Indian Anthropological Association IAA, Kolkata, pp 201–220
Saha A (2005) Tripura. In: Murayava M et al (eds) Subregional relations in the Eastern South Asia with special focus on India's North-Eastern region, IDE-JETRO, Joint Research Program Series No. 133, pp 301–320, Tokyo
Saikia PC (1984–85) Some aspects of the history & culture of the Chutias of upper Assam. JARS 28:51–61
Saikia MM (1986) Seismic activity in Northeastern region of India. In: Proceedings of symposium, earthquake prediction: present status, Department of Geology, University of Pune, Pune, 10–11 July 1986, pp 223–233
Saikia R (2000) Social and economic history of Assam (1853–1921). Manohar Publishers, Delhi
Saikia A (2006) Global processes and local concerns. Bangladeshi migrants in Assam. In: Kumar BB (ed) Illegal migration from Bangladesh. Concept, Delhi, pp 187–211
Sailo (Brig) T (2001) A soldier's story. Calcutta
Sale HM, Evans P (1937) Geology of Assam Arakan Region. Geol Mag 77(5):337–362
Samanta RK (1982) Shifting and settled cultivation perception of tribal farmers in Tripura. Man India 62(2):186–190
Sanajaoba N (ed) (1988) Manipur: past and present (3 volumes). Mittal Publications, New Delhi
Sangma MS (1981) History and culture of the Garos. Books Today, New Delhi
Sangma MS (1983) History of the Garo literature. NEHU, Shillong
Sangma MS (ed) (1994) Essays on North-East India. New Delhi

Sangma MS (1995) Hill societies and their modernization – about Garos. Omsons Publications, New Delhi
Sarfaraz A (2003) Environmentally induced migration from Bangladesh to India. Strateg Anal 27:422–437
Sarkar RDG (1981) A study in trends and periodicities of rainfall over Brahmaputra catchment. Basin hydrology. Monograph no. 9. IMD, Govt. of India, Pune
Sarkar J (1987) Society, culture and ecological adaptation among three tribes of Arunachal Pradesh. Anthropology Survey India
Sarkar K, Nandy DR (1974) Recent advances in the study of Tertiary stratigraphy of NE India – a critical resume. GSI Spl Publ 23:15
Sarma SN (1966) The new Vaisnavite movement and Satra institution of Assam. Gauhati University Press
Sarma U (1970) The problem of village Hinduism. Contrib Indian Sociol (NS) 4:1–2
Sarma SN (1981) Social changes in Assam – 1750 to 1950. J Univ Gauhati 28–29:109–121
Sarma JN (2005) Fluvial process and morphology of the Brahmaputra River in Assam, India. Geomorphology 70(3–4):226–256
Sarma H, Chatterjee B, Jha N, Gill PS (1991) Geology of parts of West Garo Hills District, Meghalaya. GSI Rec 124(pt. IV):52–57
Sathpathy KK (1996a) Hill slope runoff under conservation practices. Research Bulletin No. 40, ICAR Research Complex for NEH Region, Barapani
Sathpathy KK (1996b) Rainfall trend and its erosion potential at Barapani. Research Bulletin No. 41, ICAR Research Complex for NEH Region, Barapani
Sathpathy KK (1996c) Hydrological aspects of water harvesting tanks in hills. Bulletin No. 42, ICAR Research Complex for North-East Hill Region, Barapani
Satyabala SP (1998) Subduction in the Indo-Burma region: is it still active? Geophys Res Lett 25:3189–3192
Schmidt PW (1906) The Mon-Khmer peoples, a link between the peoples of Central Asia and Austronesia. Archiv für Anthropologie, Braunschweig, new series 5:59–109
Sen S (1985) The tribes of Meghalaya. Mittal Publications, New Delhi
Sen S (1987) The tribes of Nagaland. Mittal Publications, New Delhi
Sen S (1992a) Tribes and castes of Manipur. Mittal Publications, New Delhi
Sen S (1992b) Tribes of Mizoram: description, ethnology, bibliography. Gyan Publishing House, New Delhi
Sengupta S (ed) (2008) Peoples of North-East India. Gyan Publishing House, New Delhi
Seth SK, Yadav JSP (1960) Soils of the tropical moist evergreen forests of India. Indian For 86(7): 401–413
Shakespear Col J (1909–10) The Kuki, Lushai clans. J R Anthropol Inst 39:371–85
Shakespear (Col.) LW (1914) History of upper Assam, upper Burma and North-Eastern frontier. Macmillan, London
Sharma TC (1966) Researches on the prehistoric archaeology of Assam. J Assam Sci Soc 9:4–7, Gauhati
Sharma TC (1967) A note on the Neolithic pottery of Assam. Man 2(1):126–128
Sharma KM (1980a) The Assam question: a historical perspective. Econ Polit Wkly 15(31):1321
Sharma P (1980b) A region of neglected potentialities. In: Assam and Assamese mind, Assam Sahitya Sabha. Jorhat
Sharma TC (1986) Recent advances in prehistory and archaeology of North-East India. JARS 1984–85:1–28
Sharma M (1990) Social and economic change in Assam. New Delhi
Sharma BK (1993) Industrial landscape of North-East India. Mittal Publications, New Delhi
Sharma HC, Roy SK (1978) On the discovery of pebble tool industry in the Garo Hills, Meghalaya. In: Post-plenary symposium on recent advances in Indo-Pacific prehistory (10th ICAES). Deccan College, Pune
Shaw W (1928) Notes on the Thado Kukis. J Asiatic Soc Bengal 26

Shimmi YLR (1826) Comparative history of Nagas from ancient period till 1826, Tribal studies of India series, T 128. Inter India Publications, New Delhi
Shimray RR (1985) Origin and culture of Nagas. Pampleiphi Shimray, New Delhi
Shukla SP, Aggarwal AK (1986) Agriculture in North-Eastern region. NPH, New Delhi
Sikri DK (2001) Census of India, Scheduled Tribes Atlas
Sikri DK (2005) Census of India 2001, Tripura Administrative Atlas. Registrar General & Census Commissioner
Sing KK (1995) Zo people and their culture. Khampi Hatzaw, Lamka
Singh S (1935) A Contribution to Angami and Sema Somatology. J Asiatic Soc Bengal 1:93–97
Singh KS (ed) (1972a) Tribal situation in India. IIAS, Simla
Singh NT (1972b) Manipur: a study. Rajesh Printing Press, Delhi
Singh OK (1972c) Antiquities of Manipur. Bull Manipur State Mus 1:1–3
Singh KS (ed) (1982) Tribal movements in India, vol 1&2. Manohar, New Delhi
Singh B (1984) Conservation of Genetic Resources of eastern Himalayan region with special reference to citrus. In: Tripathi RS (ed) Resource potential of North-East India. vol II (Living resources). Meghalaya Science Society, Shillong, pp 17–21
Singh KS (ed) (1988a) People of India. National series vol VI, Indian Communities. ASI
Singh WI (1988b) The History of Manipur. Imphal
Singh NJ (1992) Social movement in Manipur. Mittal Publications, New Delhi
Singh KS (1994) The scheduled tribes of India. National series vol III. ASI & OUP
Singh NL (1998a) The unquiet valley. Mittal Publications, New Delhi
Singh NK (1998b) The socio-political dynamics in the North-East: a geostrategic interpretation. M.Phil. dissertation, JNU, Delhi
Singh T (2003) Geo-environmental hazards vis-à-vis restless Arunachal Pradesh. In: Zahid H (ed) Environmental issues of North-East India. Regency Publications, New Delhi, pp 11–20
Singh S (2007) Rainfall runoff conditions in Meghalaya Plateau, a case study of Paham Syiem watershed, Research monograph. NEHU, Shillong
Singh RK Jhalajit (1987) A short history of Manipur, 2nd edn. Imphal
Singh S, Daimari TC (2003) Determinants of labour productivity in tea cultivation in the Upper Brahmaputra Valley. TIIG 25(162):9–19
Singh W, Sharma TC (1968) On the discovery of stone age relics from Manipur. J Assam Sci Soc 12:36–48
Singh ND, Singh YN (2008) Evolution of settlements in Manipur valley. Trans Inst Indian Geogr 30:176
Singh ND, Singh SB, Singh AM (2010) The vulnerable Loktak. Hill Geogr 26:93–109
Sinha R (1962) The Akas. Research Department, Adviser's Secretariat, Shillong
Sinha K (1970) Meghalaya: triumph of tribal genius. Publication Division, Delhi
Sinha R (1977) Religion and culture of North-East India. Abhinav Publications, New Delhi
Sinha AC (1993) Beyond the trees, tigers and tribes. Har Anand Publications, New Delhi
Sinha AC (1998) Bhutan: ethnic identity and national dilemma. Reliance Publishing House, New Delhi
Sinha AC (2003a) The Nepalese in Northeast India – a community in search of Indian identity. Indus Publishing Co, New Delhi
Sinha M (2003b) Tribal – non-Tribal boundaries in Assam with special reference to areas of Bodo concentration. Ph.D. dissertation North-Eastern Hill University, Shillong
Sinha AC (2005) Arunachal Pradesh. In: Murayava M, Inoue K, Hazarika S (eds) Subregional relations in the Eastern South Asia with special focus on India's North-Eastern region. IDE-JETRO, pp 33–50
Sinha Lt. Gen SK (1998) Report on "Illegal Migration into Assam", para 1 of the letter to the President of India written on 8th November 1998
Soppitt CA (1885) Account of the Kacha Nagas. Assam Secretariat Press, Shillong

Sridevi J (2004) Estimates of plate velocity and crustal deformation in the Indian subcontinent using GPS geodesy. Curr Sci 86(10):1443–1448
Srivastava LRN (1962) The Gallong. Research Department, Shillong
Srivastava LRN (1973) Among the Wanchos of Arunachal Pradesh. Shillong
Stack E (1908) The Mikirs (edited, arranged and supplemented by Sir Charles Lyall) from the papers of late Edward Stack. United Publishers, Gauhati
Stebbing EP (1962) Forests of India. vol IV, being the history from 1925 to 1947 of the forests now in Burma, India & Pakistan, edited by Sir Harris Champion and F. C. Osmaton. OUP
Steel EH (1870) Celts found among the Namsang Nagas. Proc Asiatic Soc Bengal, 267–268
Stone, Sir James (1971-reprint) My experiences in Manipur and Naga Hills. Vivek Publishing House, Delhi
Stracey PD (1968) Nagaland nightmare. Applied Publishers, Bombay
Strachey PD (1956) Development of forestry in Assam in the last fifty years. Indian For 82(2):619–623
Streward (Major) (1855) Notes on Kachar. J Asiatic Soc Bengal, 7
Suba TB, Ghosh GC (eds) (2003) An anthropology of North-East India: a text book. Orient Longman
Suba TB, Ghosh GC (2004) Interethnic relationship in Northeast India and the 'Negative Solidarity' thesis. In: Basu A et al (eds) Anthropology for North-east India: a reader. Special Publication of the Indian National Confederation & Academy of Anthropologists, Kolkata
Surendranath M, Sharma GS (1991) Quaternary geology and geomorphology of Brahmaputra valley in parts of Nagaon and Golaghat Districts, Assam. Rec GSI 124(pt. 4):45–48
Suri R (1985) Physical anthropology of Angami Naga. A tribe of North-East India. Ph.D. dissertation, Gauhati University
Syiemlieh HJ, Das P (2004) Orographic effects on the distribution of rainfall in North-East India. TIIG 26(1):12–20

T

Taher M (1975) Regional basis of agricultural planning in Brahmaputra Valley. North-Eastern Geogr 18 (1&2)
Taher M (1989) Physiographic framework of North-East India. North-East Geogr 18(1&2):1–19
Tandon P, Kumaria S (2010) Forest resources of North East India and their sustainable utilization. In: Hasnain SE et al (ed) Biotechnology for sustainable development: achievements and challenges. McGraw Hill Education, pp 183–191
Tendulkar Committee (2009)
Thane GD (1882) On some Naga skulls. J R Anthropol Inst 11:215–218
Thomas CJ (2002) Dimensions of displaced people in North-East India. Regency Publication, New Delhi
Thompson WH (1923) Census of India 1921, Bengal, pt. I, Report Ben. Sec. Bk. Depot, Calcutta, p 162
Thornton E (1854) Gazetteer of the territories under the Government of East India Co., and the native states on the continent of India. H. Allen & Co., London (4 volumes)
Tiwari RP, Kumar S (1997) South Hlimen landslide in Mizoram – a pointer. ENVIS Bull Himal Ecol Dev 5(2):12–13
Tiwari RP, Sharma BL, Singh B (1996) Geotechnical appraisal of Bawngkawn Landslide, Aizawl, Mizoram. In: Proceedings of the international conference on disaster and mitigation, Madras, pp 125–131
Tripathi RS (2005) Sacred groves of Northeast India and their floristic richness and significance in biodiversity conservation. EnviroNews-Newslett ISEB India 11(3):1–2
Troupe RS (1986, reprint) The silviculture of Indian trees, 3 vols. Originally published by International Book Publishers, Dehradun

V

Vanlal C (2004) Zofate economy (Economy of the Zos and the Mizos). Zambo Publishing House, Aizawl
Venkata Rao V, Hazarika N (1984) A century of government and politics in North-East India, 1874–1980. S. Chand
Verghese BG (1996) India's North-East resurgent: ethnicity, insurgency, governance, development. Konark, Delhi
Verghese BG (2004) Border matters more than the boundaries, from the North-East looking out. Man and Society. ICSSR, NE Regional Centre, Shillong 1(1)

W

Waddell LA (1901) The tribes of the Brahmaputra valley. J Asiatic Soc Bengal, 69(pt. 3):1–127, reprint Concept, Delhi
Wanghshimenla (2002) Environmental ethics, social norms and land use practices in Ao region, Nagaland. Ph.D. dissertation, Nagaland University, Lumani
Water Power Consultancy Services (WAPCOS) (1993) Morphological studies of river Brahmaputra. Ministry of Water Resources, New Delhi
Webster D (2003) Blood, sweat and toil along Burma road. National Geographic (November):84–103
Weiner M (1979) Sons of soil, migration and ethnic conflict in India. OUP, New Delhi
White JC (1971) Sikkim and Bhutan twenty-five years of Northeast frontier (1887–1907). Vivek Publishing House, Delhi, Reprint
Wilcox (Lt.) R (1832) Memoir of the survey of Assam and neighbouring countries executed in 1825, 1826, 27, & 28. Asiatic Researches, vol 17, map on page 314
Woodman D (1962) The making of Burma. Cresset Press, New York
Woodman D (1969) Himalayan frontiers. Praeger, New York
Woodthorpe (Lt. Col.) RG (1882) Notes on the wild tribes inhabiting the so-called Naga Hills on our North-East Frontier of India. J R Anthropol Inst G B Irel (pt. I):56–74 & (pt. II):196–219
www.mospi.gov.in (2006) Central Statistical Organisation, selected socio-economic statistics – percentage of population below poverty line (1999–2000)

Y

Yemben S (1976) Nupi Lan: Manipur women's agitation. Econ Polit Wkly 11(8):325–331
Yonuo A (1974) The Rising Nagas. Vivek Publishing House, Delhi

Z

Zakhuma KM (2001) Political development in Mizoram from 1946 to 1989. Mizoram Publication Board, Aizawl

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