

Chapter 22

Farm Growth in Northeast India and Its Effect on Poverty

K.U. Viswanathan and Anannya Gupta

Abstract Experience of growth in BRICS countries shows that one percentage growth in agriculture is two to three times more effective in poverty reduction when compared to one percentage growth emanating from non-agricultural sectors. State average of sectoral GSDP growth over 2008–09 to 2013–14 shows a recovery of 4.1% per annum as compared to 1.7% per annum during 2000–01 to 2004–05. Six out of the eight Northeastern states of India show higher than all India average performance during this period, viz. Sikkim (9.8%), Tripura (6.1%), Arunachal Pradesh (5.5%), Meghalaya (4.9%), Nagaland (4.9%) and Mizoram (4.3%). State wise analysis of various agricultural parameters and multi-dimensional poverty indicators revealed that each state has a unique relationship in terms of growth in agriculture and poverty. The hypothesis of high farm growth reduced poverty was true for Sikkim, Tripura, Meghalaya and Assam and true in the reverse direction for Manipur. High growth of agriculture was non-inclusive and hence could not have impact on poverty in Arunachal Pradesh and Nagaland. Mizoram with too many population in rural areas depending on agriculture had high farm growth and but increase in rural poverty. However, the state had only 0.094 MPI value in 2011–12. Overall, states with high GSDPA growth observed reduced poverty taking other parameters into account. States with high share of Non-Farm Sector (NFS) and Animal Husbandry (AH) in monthly income of agricultural household had improving rural poverty. Improving performance of agriculture needs to be focused upon reducing poverty, both incidence and intensity of poverty. Among agricultural inputs, irrigation needs to be prioritised, as in ground water resources in northeast India are under-utilized while blessed with sufficient rainfall, which offers scope to install a battery of shallow and deep tube wells to draw ground water during the Rabi season. Further, efforts are to be made to increase production and productivity of high-value crops. Northeastern states have

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skill and raw materials to engage in self-employment activities, viz. weaving, pottery, cane and bamboo products, etc., and therefore, with the development of agriculture sector, NFS also to be stressed upon.

Keywords Farm growth · Poverty · Source of growth · Inclusion

22.1 Introduction

Endowed with abundant natural resources like fertile land, sufficient rainfall, rich bio-diversity and unique socio-cultural characteristics, North-Eastern Region (NER) of India offers potential for tremendous growth. The Region, constituting eight states namely Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Tripura and Sikkim,¹ cover an area of 2.62 lakh sq. km. and population of 4.5 crore, constituting 7.9% of the country's total geographical area and 3.8% of the population, respectively. Among NER states there are substantial variations in geographical, demographical and socio-economic aspects. Arunachal Pradesh is the biggest state in NER in terms of area (32%) followed by Assam (30%), but 68% of total population of the region lives in the state of Assam. Consequently, the population density varies greatly from 17 persons per sq. km in Arunachal Pradesh to 397 persons per sq. km in Assam. The forest cover of the NER is more than 50% of its total geographical area, which ranges from 24% in Assam to 82% in Sikkim. More than 80% of the population lives in the rural areas and 20% in urban areas (Table 22.1). Development of NER is often referred as lagging, citing comparatively high poverty ratios, past incidences of disturbance in the social order and ascribing to its hilly terrain and associated physical and institutional infrastructure constraints.

Poverty, although defined as lack of adequate income, has several expressions like hunger, malnutrition, low access to education/health/other basic services and an overall exclusion in civil, social and cultural life. As per the latest estimates,² population below poverty line was 28.4% in the NER as compared to 21.9% in all India. In other words, NER had a share of 5% of poor population compared to its share of 3.8% in the total population. Rural poverty ratio was high at 31.2% as compared to urban poverty at 18.5%. As majority of the rural working population (varying from 56 to 83%) are dependent on agriculture, either as cultivators or as agricultural labourers, the performance of agriculture has a direct bearing on the poverty. Experience of growth in BRICS countries shows that one percentage growth in agriculture is two to three times more effective in poverty reduction when compared to one percentage growth emanating from non-agricultural sectors (GoI

¹Sikkim joined the Indian union through a referendum in 1975 and was recognized as part of Northeast India in the 1990s.

²Planning Commission estimates based on Tendulkar Committee methodology.

Table 22.1 Profile of northeastern states of India

States	Geographical area ('000 ha) (2012–13)	Total population (crore)	Share of rural population (%)	GCA ('000 ha) (2012–13)	BPL population (2011–12) (%)
Arunachal Pradesh	8374	0.1	77.1	285	34.7
Assam	7844	3.1	85.9	4197	32.0
Manipur	2233	0.3	70.8	309	36.9
Meghalaya	2242.9	0.3	79.9	340	11.9
Mizoram	2108	0.1	47.9	116	20.4
Nagaland	1658	0.2	71.1	489	18.9
Sikkim	710	0.1	74.8	144	8.2
Tripura	1049	0.4	73.8	368	14.1
NER	26218.9	4.6	81.6	6246.911	28.4
All India	328,725.9	121.1	68.9	194,399	21.9

Source Land Use Statistics: Directorate of Economics and Statistics; Census 2011

2012a). Against this background, this chapter discusses agricultural growth in NER and its impact on poverty. Rest of the chapter is presented in four sections, viz. conceptual framework and methodology, performance of agriculture in NER, profile of poverty in NER vis-à-vis farm growth and conclusions and policy implications.

22.2 Conceptual Framework and Methodology

Impact of farm growth on poverty has been explored widely in the past. The benefits of farm growth reaches the poor by way of reduced food prices, increased demand for wage labour and opportunity for self-employment in rural non-farm ventures related to industry, business and services. According to Binswanger (1986), although, agricultural intensification may involve some labour-economizing innovations like mechanical threshing, new varieties of seeds and irrigation have allowed farmers to double- and even triple-crop the land, which has consistently increased labour demand. Several studies have indicated that increasing agricultural productivity in India was associated with the adoption of new technologies that increased demand for labour and majority of the additional labour used was hired rather than family labour (Lipton and Longhurst 1989; Hazell et al. 1991). Datt and Ravallion (1996) showed that in India rural sector growth has been instrumental in reducing poverty in both rural and urban areas, while economic growth in urban areas was not much effective in reducing rural poverty. Warr (2001) provided evidence that growth in agriculture in a number of South East Asian countries significantly reduced poverty, but this was not matched by growth in manufacturing. Gallup et al. (1997) showed that every 1% growth in per capita agricultural

Gross Domestic Product (GDP) led to 1.61% growth in the incomes of the poorest 20% of the population—much greater than the impact of similar increases in the manufacturing or service sectors. One of the disquieting features of Indian agriculture is the continuous subdivision and fragmentation of operational land holdings making the units uneconomical to operate.

Data used in the chapter are collected from secondary sources like Census 2011, Agricultural census 2010–11, Statistical abstracts relating to Indian Economy and States of India, CMIE, Indian Horticulture Database, 2013, Agricultural Statistics at a Glance, etc. For statistical analysis percentages, shares and Compound Annual Growth Rates (CAGR) are used.

22.3 Performance of Agriculture in the NER

22.3.1 *Share of Agriculture in Total GSDP*

With the growth of a country, the structure of the economy changes with lower share of primary sector in total GDP of the country. Analysis of the share of GDP from agriculture and allied sector (GSDPA) over 5-year period (2008–09 to 2013–14) shows that the theory holds good for India and NER states, except for Arunachal Pradesh, which observed marginal increase in the share of GSDPA (Table 22.2). In 2013–14 the share of GSDPA in total GDP of respective state varied widely across NER states ranging from 9% in Sikkim to 30% in Arunachal Pradesh. The share of GSDPA was more than the all India average of 13.94% in 7 out of 8 NER states signifying their dependence on agriculture. In 2013–14 NER states contributed 4% of agri and allied sector GDP in India with Assam alone contributing 56% of NER. In 2012–13 the share of NER in GCA was 3.2%, with Arunachal Pradesh having major share (69%).

During 2008–09 to 2013–14, national GDP recorded a growth of 6.7% per annum and 5 out of 8 NER states had grown above this national average (Table 22.3). Sikkim had a CAGR of 19%, which mainly attributed by growth in Industrial Sector. This is beneficial for long run sustainability of the growth process. It also marked 10% growth in agriculture sector, highest among NER states. Like the national scenario, most of the States observed relatively more growth in service sector than the other two sectors. Further, except Manipur and Assam, all NER states had higher growth rate in GSDPA than national average of 4.1%.

Table 22.2 Gross state domestic product from agri and allied sector in northeast India

States	Share of GSDP from agriculture and allied sector in total GSDP		Share in GSDPA in India (2013–14)	Share in gross cropped area in India (2012–13)
	2013–14	2008–09		
Arunachal Pradesh	30.31	29.79	0.22	0.1
Assam	20.73	23.36	2.25	2.2
Manipur	19.72	24.26	0.21	0.2
Meghalaya	15.92	18.58	0.27	0.2
Mizoram	18.07	21.74	0.13	0.1
Nagaland	25.39	28.71	0.36	0.3
Sikkim	9.48	14.4	0.07	0.1
Tripura	22.11	25.64	0.52	0.2
NER	20.59	23.66	4.02	0.1
India	13.94	15.77	100	100.0

Source CMIE—States of India—Gross State Domestic Product at Constant Prices: Base Year 2004–05: By Economic Activity (accessed on 30/06/2015)

Table 22.3 Growth of gross state domestic product from various sectors

States	Compound annual growth rate (2008–09 to 2013–14)			
	Gross domestic product	Agriculture, forestry and fishing	Industry	Services
Arunachal Pradesh	5.1	5.5	1.9	7.8
Assam	6.3	3.8	5.3	7.7
Manipur	5.8	1.5	–0.3	12.0
Meghalaya	8.2	4.9	9.2	8.7
Mizoram	8.2	4.3	2.9	11.1
Nagaland	7.5	4.9	3.8	9.7
Sikkim	19.4	9.8	33.2	7.5
Tripura	9.3	6.1	7.9	11.4
India	6.7	4.1	5.1	8.1

Source Calculated based on CMIE data base—States of India; extracted on: 30 June 2015

22.3.2 *Change in Gross Cropped Area, Net Sown Area and Cropping Intensity*

Production of agricultural crops depends on the expansion of area cultivated, i.e. net sown area, and the number of times an area is being cultivated, i.e. cropping intensity. Over a period of 9 years (i.e. 2003–04 to 2012–13), Net Sown Area (NSA) in India had reduced marginally (Table 22.4). Whereas for NER states as a

Table 22.4 Change in GCA, NSA and cropping intensity (000 Ha)

States	Years	Net sown area	Gross cropped area	Cropping intensity
Arunachal Pradesh	2003–04	201	254	126.4
	2012–13	216	285	131.7
Assam	2003–04	2753	3957	143.7
	2012–13	2811	4197	149.3
Manipur	2003–04	217	217	100.0
	2012–13	309	309	100.0
Meghalaya	2003–04	227	272	120.2
	2012–13	285	340	119.0
Mizoram	2003–04	98	98	100.0
	2012–13	116	116	100.0
Nagaland	2003–04	305	370	121.2
	2012–13	380	489	128.5
Sikkim	2003–04	78	121	155.1
	2012–13	77	144	185.7
Tripura	2003–04	280	283	101.2
	2012–13	256	368	144.1
NER	2003–04	4159 (2.96)	5573	134.0
	2012–13	4450 (3.20)	6247	140.4
All India	2003–04	140,708	189,661	134.8
	2012–13	139,932	194,399	138.9

Source Land Use Statistics at a Glance-State Wise: 2003–04 to 2012–13, Directorate of Economics and Statistics, Department of Agriculture and Cooperation, MoA, GOI

Note Figures in brackets are percentages to all India

whole it had increased over the same period, resulting in marginal increase in share of NER states in India to 3.2% in 2012–13 from 2.96% in 2003–04. Out of eight NER states, two states (Sikkim & Tripura) had decrease in NSA. Gross Cropped Area (GCA) had increased in all the NER states as also at all India level which was a combined effect of increase in NSA and cropping intensity in NER states and due to increase in cropping intensity alone at all India level.

22.3.3 Status of Irrigation

Among all the inputs, irrigation has most significant impact on agricultural production. Lack of irrigation also results in mono cropping or fallow land. In 2012–13, gross irrigated area as a percentage of GCA was a mere 10.3% in the NER as against all India average of 47.6%. The situation was all the more poor to notice that the percentage of irrigated area had reduced between 2003–04 and 2012–13 in NER

Table 22.5 Gross cropped area and gross irrigated area (000 Ha)

States	Years	Gross cropped area	Gross irrigated area	Percentage of gross irrigated area to gross cropped area
Arunachal Pradesh	2003–04	254	47	18.6
	2012–13	285	57	19.9
Assam	2003–04	3957	173	4.4
	2012–13	4197	160	3.8
Manipur	2003–04	217	40	18.4
	2012–13	309	49	15.7
Meghalaya	2003–04	272	82	30.3
	2012–13	340	125	36.8
Mizoram	2003–04	98	18	18.4
	2012–13	116	15	12.6
Nagaland	2003–04	370	104	28.1
	2012–13	489	92	18.9
Sikkim	2003–04	121	11	9.4
	2012–13	144	19	13.5
Tripura	2003–04	283	108	38.2
	2012–13	368	128	34.9
NER	2003–04	5573	584	10.5
	2012–13	6247	645	10.3
All India	2003–04	189,661	78,042	41.1
	2012–13	194,399	92,575	47.6

Source Land Use Statistics at a Glance-State Wise: 2003–04 to 2012–13, Directorate of Economics and Statistics, Department of Agriculture and Cooperation, MoA, GOI

as compared to an increase from 41.1 to 47.6% at all India (Table 22.5). However, 3 NER states, viz. Arunachal Pradesh, Meghalaya and Sikkim, had marked increase in the percentage of irrigated area (Fig. 22.1).

22.3.4 Cropping Pattern

During the period 2003–04 to 2012–13, there was shift in cropping pattern in favour of non-food crops like oilseeds and fibre crops at all India level, increasing their share in GCA from 25.1% to 28.4%. However, such shift in favour of non-food crops was marginal in the NER. What was obvious in the NER was area shift within food crops in favour of pulses, condiments and spices and more strongly towards fruits and vegetables. This reflects shift in cropping pattern as a result of the changing dietary pattern and demand for high-value food crops and can be gauged as slow transformation of NER agriculture from subsistence to market oriented (Tables 22.6 and 22.7). The share of NER states in the country in terms of

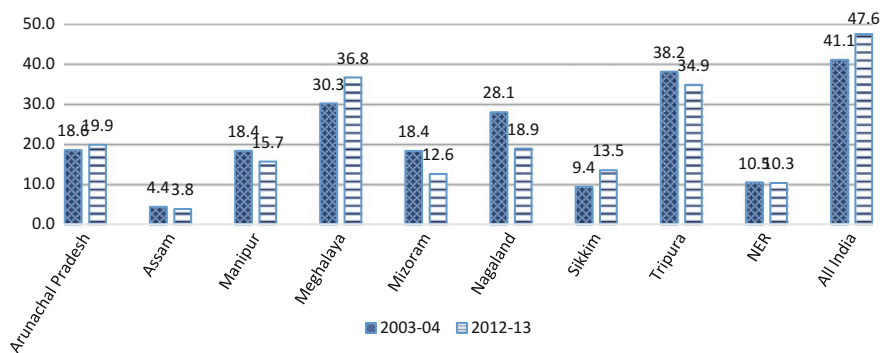


Fig. 22.1 Percentage of gross irrigated area to total cropped area. *Source* Land Use Statistics at a Glance-State Wise: 2003–04 to 2012–13, Directorate of Economics and Statistics, Department of Agriculture and Cooperation, MoA, GOI

area under fruits and Vegetables doubled (5% in 2003–04 and 10% in 2012–13). Shift in cropping pattern from food grain to high-value crops like condiments and spices and fruits and vegetables was more prominent Assam, Mizoram, Sikkim and Tripura.

Comparative analysis of share of area under food and non-food crops in gross cropped area, between two period of time, 2003–04 and 2012–13, shows that for India as a whole the share of non-food crops has increased and for NER it has increased marginally (Fig. 22.2). Further, among food crops, share of high-value crops (fruits and vegetable, condiments and spices and sugar) has increased for both India and NER.

Among NER states Manipur observed significant increase in share of non-food crop. Mizoram has experienced substantial increase in share of area under high-value food crops, which is accompanied by significant reduction in area under food grain. Other NER states like, Assam, Meghalaya, Nagaland, Sikkim and Tripura have also observed increase in relative share of area under high-value food crops.

22.3.5 Production and Yield of Agriculture Produce

Out of total food grain production of 265 million tons in 2013–14, NER states contributed 2.95% which had increased from 2.8% in 2003–04 (Table 22.8).

In 2013–14, excepting two states (Meghalaya and Tripura), all the NER states had lower than national average yield of food grains. Growth in yield of food grain from 2003–04 to 2013–14, reveals that 5 States, viz. Assam (2.7%), Arunachal Pradesh (3.5%), Meghalaya (3.3%), Nagaland (2.6%) and Tripura (2.4%) have shown above average growth rate of 2.1% at all India. However, Mizoram and Manipur, the States which had shown above average yield in 2003–04, experienced negative growth during this period.

Table 22.6 Area under food crops (000 ha)

States	Years	Cereals and millets	Pulses	Food grains	Sugar	Condiments and spices	Fruits and vegetables
Arunachal Pradesh	2003–04	184	7	191	1	7	21
	2012–13	210	9	220	2	10	20
Assam	2003–04	2628	115	2743	25	133	289
	2012–13	2550	141	2691	29	172	489
Manipur	2003–04	160	6	167	0	17	33
	2012–13	180	30	210	6	12	38
Meghalaya	2003–04	130	3	134	0	28	83
	2012–13	131	8	139	0	31	130
Mizoram	2003–04	70	5	75	1	9	4
	2012–13	31	4	35	1	19	58
Nagaland	2003–04	233	33	266	6	9	20
	2012–13	267	36	303	4	11	88
Sikkim	2003–04	65	7	72	–	32	8
	2012–13	60	6	66	–	27	43
Tripura	2003–04	261	8	268	1	–	6
	2012–13	259	8	267	1	10	73
NER	2003–04	3730 (66.9)	184 (3.3)	3914 (70.2)	35 (0.6)	234 (4.2)	463 (8.3)
	2012–13	3688 (59.0)	244 (3.9)	3932 (62.9)	43 (0.7)	291 (4.6)	939 (15.0)
All India	2003–04	100,513 (53.0)	24,458 (12.9)	124,971 (65.9)	4562 (2.4)	3195 (1.7)	9331 (4.9)
	2012–13	98,398 (50.6)	21959 (11.3)	120,357 (61.9)	5488 (2.8)	3312 (1.7)	9811 (5.0)

Source Land Use Statistics at a Glance-State Wise: 2003–04 to 2012–13, Directorate of Economics and Statistics, Department of Agriculture and Cooperation, MoA, GOI

Notes (1) '0' means area is less than 500 hectares; (2) blank space (–) denotes not available or no reporting of data from the States; (3) figures in brackets are percentages to GCA

In case of fruits and vegetables, although the area share had increased, the production share of NER states in all India declined from 5.9% in 2001–02 to 4.0% 2012–13 due to higher productivity levels in other States, resulting in lower growth in production of fruits and vegetables in NER (3.6%) compared to all India (7.2%) (Table 22.9). At all India level, growth in yield of fruits and vegetables was 1.6% per annum compared to a marginal growth rate of 0.2% in NER.

Table 22.7 Area under non-food crops (000 ha)

States	Years	Food crops	Oilseeds	Fibres	Total non-food crops	Gross cropped area
Arunachal Pradesh	2003–04	220	28	–	34	254
	2012–13	252	33	–	33	285
Assam	2003–04	3214	327	85	743	3957
	2012–13	3407	335	86	790	4197
Manipur	2003–04	216	1	–	1	217
	2012–13	265	44	–	44	309
Meghalaya	2003–04	245	10	16	28	272
	2012–13	300	14	18	40	340
Mizoram	2003–04	89	7	0	8	98
	2012–13	113	2	0	3	116
Nagaland	2003–04	301	62	4	69	370
	2012–13	407	68	5	82	489
Sikkim	2003–04	111	10	–	10	121
	2012–13	135	8	–	8	144
Tripura	2003–04	275	4	4	8	283
	2012–13	351	15	2	17	368
NER	2003–04	4672 (83.8)	450 (8.0)	109 (2.0)	901 (16.2)	5573 (100)
	2012–13	5230 (83.7)	519 (8.3)	111 (1.8)	1017 (16.3)	6247 (100)
All India	2003–04	142,129 (74.9)	26,226 (13.8)	9168 (4.8)	47,532 (25.1)	189,661 (100)
	2012–13	139,174 (71.6)	29,097 (15.0)	12,793 (6.6)	55,225 (28.4)	194,399 (100)

Source Land Use Statistics at a Glance-State Wise: 2003–04 to 2012–13, Directorate of Economics and Statistics, Department of Agriculture and Cooperation, MoA, GOI

Notes (1) 0' means area is less than 500 ha; (2) blank space (–) denotes not available or no reporting of data from the states; (3) figures in brackets are percentages to GCA

22.3.6 Distribution of Land Holdings

One of the major impediments to the growth of Indian agriculture is small and fragmented land holdings. The average size of operational land holdings in the country reduced from 2.28 ha in 1970–71 to 1.16 ha in 2010–11. In 4 out of 8 NER states, the average size of land holdings was more than national average, with Nagaland (6.03 ha) and Arunachal Pradesh (3.52 ha) having exceptionally high average where the majority of the operational holdings were concentrated in Semi-Medium and Medium categories (Table 22.10).

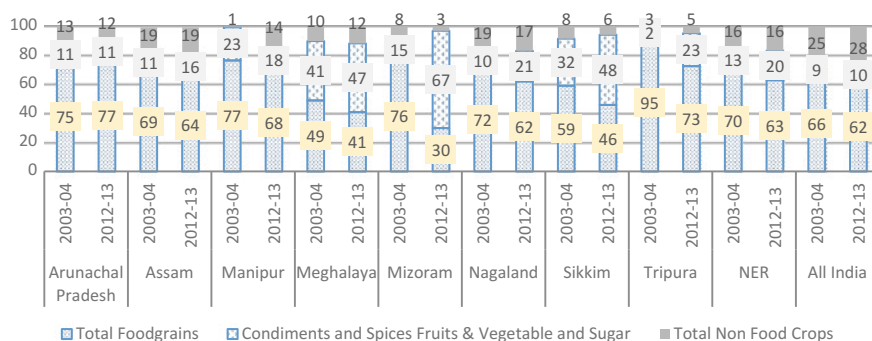


Fig. 22.2 Distribution of area under various types of food crops and non-food crops. *Source* Land Use Statistics at a Glance-State Wise: 2003-04 to 2012-13, Directorate of Economics and Statistics, Department of Agriculture and Cooperation, MoA, GOI

Table 22.8 Growth in production and yield of food grain

States	Production ('000 tonnes)			Yield (kg/ha)		
	2003-04	2013-14	Growth	2003-04	2013-14	Growth
Arunachal Pradesh	244.1	384.6	4.7	1277.3	1794.1	3.5
Assam	4035.0	5096.8	2.4	1471.6	1916.1	2.7
Manipur	391.9	490.6	2.3	2,355.2	1,745.4	-3.0
Meghalaya	233.8	320	3.2	1733.1	2387.0	3.3
Mizoram	139.4	72.8	-6.3	1853.7	1505.6	-2.1
Nagaland	409.8	624.6	4.3	1560.5	2017.8	2.6
Sikkim	99.9	102.4	0.2	1395.3	1576.7	1.2
Tripura	529.1	726.7	3.2	2120.6	2680.3	2.4
NER	6083.0 (2.8)	7817.7 (2.95)				
India	213,189.4	265,043.2	2.2	1730.0	2119.6	2.1

Source CMIE

Note Figures in parenthesis are percentage to all India

22.3.7 Employment Scenario in Agriculture

The percentage of rural working population depending on agriculture for employment was 72.3 at all India and 59.3 in NER. The lower percentage of rural working population in agriculture of NER was due to relatively low percentage of agricultural labourer. In all NER states, percentages of rural agricultural labourer in total rural working population are much less than the India as a whole. However, percentage of rural cultivators in total rural working population is higher than all India level in all NER states except Tripura (Fig. 22.3). One plausible inference from the employment scenario is that the agriculture in NER is mostly family labour-oriented leaving less scope for hired labour unless it is highly mechanized.

Table 22.9 Production and yield of fruits and vegetables

States	Production ('000MT)			Yield (MT/ha)		
	2001–02	2012–13	CAGR (%)	2001–02	2012–13	CAGR (%)
Arunachal Pradesh	191.0	532.0	9.8	3.7	4.9	2.7
Assam	4270.3	5488.9	2.3	12.3	12.8	0.4
Manipur	399.9	844.0	7.0	6.5	9.1	3.2
Meghalaya	231.0	553.3	8.3	7.5	7.6	0.2
Mizoram	349.4	500.7	3.3	7.7	6.6	-1.4
Nagaland	362.0	408.5	1.1	9.2	6.5	-3.1
Sikkim	94.2	61.6	-3.8	2.8	3.8	2.7
Tripura	805.3	1452.0	5.5	13.5	13.8	0.2
NER	6703.1 (5.9)	9841.0 (4.0)	3.6	10.0	10.2	0.2
India	113,547.6	243,472.0	7.2	12.6	15.0	1.6

Source Indian Horticulture Database 2013

Note Figures in parenthesis are percentages to all India

Table 22.10 Size of operational holdings in NER states

State	Average size of holdings 2010–11 (ha)					
	Marginal (<1 ha)	Small (1–2 ha)	Semi-medium (2–4 ha)	Medium (4–10 ha)	Large (>10 ha)	All
Arunachal Pradesh	0.57 (19)	1.37 (17)	2.76 (31)	5.54 (26)	13.86 (7)	3.52 (100)
Assam	0.42 (67)	1.38 (18)	2.69 (11)	5.14 (3)	Neg	1.10 (100)
Manipur	0.52 (51)	1.29 (32)	2.50 (15)	4.33 (2)	Neg	1.14 (100)
Meghalaya	0.45 (49)	1.33 (28)	2.76 (19)	5.88 (4)	Neg	1.37 (100)
Mizoram	0.60 (54)	1.27 (33)	2.40 (11)	4.50 (2)	Neg	1.14 (100)
Nagaland	0.50 (4)	1.15 (11)	2.60 (27)	6.17 (44)	17.68 (14)	6.03 (100)
Sikkim	0.38 (53)	1.18 (23)	2.45 (15)	5.33 (8)	12.00 (1)	1.43 (100)
Tripura	0.28 (86)	1.38 (10)	2.45 (3)	4.67 (1)	Neg	0.49 (100)
All India	0.39 (67)	1.42 (18)	2.71 (10)	5.76 (4)	17.38 (1)	1.16 (100)

Source Agricultural census, 2010–11, GoI

Note Figures in brackets are percentage of number of holdings

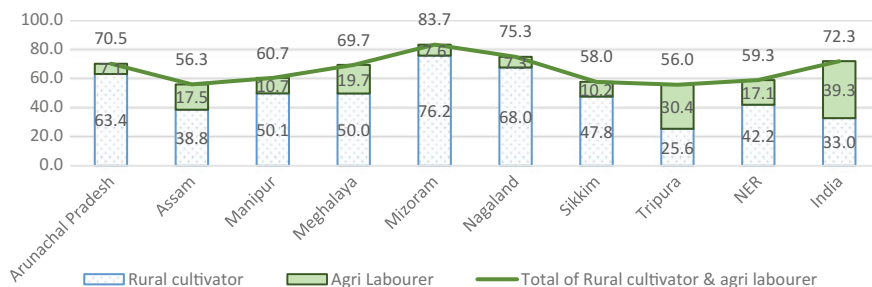


Fig. 22.3 Percentage of agri-labourers and cultivators in total rural working population. *Source* Agricultural Statistics at a Glance (2014)

22.4 Profile of Poverty in NER Vis-à-Vis Farm Growth

22.4.1 Head Count Ratio Measure of Poverty

Comparative analysis of Head Count Poverty estimated by Planning Commission for the year 2004–05 and 2011–12 showed in India percentage of population below poverty line declined from 37.2% in 2004–05 to 21.9% in 2011–12 (Table 22.11). Unlike 2004–05, in 2011–12 the poverty proportion for NER was more than national average. However, in 5 out of 8 northeast India states, the percentage of population below poverty lines was less than all India average in 2011–12.

In terms of total number of population below poverty line, Assam accounts for around 80% NER BPL population in 2011–12. Three States in NER, viz. Arunachal Pradesh, Mizoram and Nagaland had experienced increase in proportion of BPL population. In Arunachal Pradesh and Mizoram, though proportion of BPL

Table 22.11 Change in percentage of population below poverty line

States	2004–05			2011–12		
	Rural	Urban	Rural + urban	Rural	Urban	Rural + urban
Arunachal Pradesh	33.6	23.5	31.4	38.9	20.3	34.7
Assam	36.4	21.8	34.4	33.9	20.5	32.0
Manipur	39.3	34.5	37.9	38.8	32.6	36.9
Meghalaya	14.0	24.7	16.1	12.5	9.3	11.9
Mizoram	23.0	7.9	15.4	35.4	6.4	20.4
Nagaland	10.0	4.3	8.8	19.9	16.5	18.9
Sikkim	31.8	25.9	30.9	9.9	3.7	8.2
Tripura	44.5	22.5	40.0	16.5	7.4	14.1
NER	34.3	21.2	32.1	30.9	17.8	28.4
All India	41.8	25.7	37.2	25.7	13.7	21.9

Source Press note on Poverty Estimates, 2011–12: Planning Commission, July 2013

population in urban reduced, it was outweighed by rise in the proportion of BPL in rural area. On the other hand, Sikkim and Tripura observed substantial decrease in the BPL population.

22.4.2 Standard of Living of Average Agriculture Households

Monthly income and consumption level reflects the standard of living. In India, average monthly income per agricultural household during the period July 2012–June 2013 was Rs. 6426 as against monthly consumption of Rs. 6223 (Table 22.12). Per household monthly income was highest in Meghalaya and lowest in Assam and per household monthly expenditure was highest in Mizoram and lowest in Sikkim. Other than Tripura, all NER states had monthly income more than national average.

For India as a whole, income from cultivation accounts for half of the monthly income, whereas animal husbandry and non-farm sector contributing 12% and 8% of the income, respectively. The pattern is similar in all NER states except Manipur, Nagaland and Sikkim, where share of wages was more than cultivation. In Sikkim, 15% of monthly income comes from non-farm sources.

Table 22.12 Monthly income and consumption expenditure (Rs/agricultural household)

State	Net income					Consumption expenditure
	Wages	Cultivation	Animal Husbandry	NFS	Total	
Arunachal Pradesh	2076 (19.1)	6647 (61.2)	1310 (12.1)	836 (7.7)	10869 (100)	7109
Assam	1430 (21.4)	4211 (62.9)	799 (11.9)	255 (3.8)	6695 (100)	5766
Manipur	3815 (43.1)	2924 (33.1)	1563 (17.7)	540 (6.1)	8842 (100)	6490
Meghalaya	3776 (32.0)	6472 (54.9)	657 (5.6)	887 (7.5)	11792 (100)	6937
Mizoram	3655 (40.2)	4561 (50.1)	864 (9.5)	19 (0.2)	9099 (100)	7936
Nagaland	5393 (53.7)	3212 (32.0)	1384 (13.8)	59 (0.6)	10048 (100)	7285
Sikkim	3113 (45.8)	1696 (24.9)	980 (14.4)	1009 (14.8)	6798 (100)	5670
Tripura	2185 (40.2)	2772 (50.1)	311 (5.7)	162 (3.0)	5429 (100)	6922
All India	2071 (32.2)	3081 (47.9)	763 (11.9)	512 (8.0)	6426 (100)	6223

Source Key Indicators of Situation of Agricultural Households in India, NSS 70th Round, MoSPI, GoI, Dec-2014. Figures in brackets are percentages to total

Table 22.13 Deprivation in health and education

States	Infant mortality rate (per 1000 live birth)		Access to safe drinking water in rural households (%)		Rural sanitation coverage (% of hh)		Rural literacy rate (%)	
	2011	2012	2001	2011	2001	2011	2001	2011
Arunachal Pradesh	32	33	73.7	74.3	47.34	55.7	47.8	59.9
Assam	55	55	56.8	68.3	59.57	61.5	59.7	69.3
Manipur	11	10	29.3	37.5	77.5	87.7	67.3	76.2
Meghalaya	52	49	29.5	35.1	40.1	56.9	56.3	69.9
Mizoram	34	35	23.8	43.4	79.74	87.1	81.3	84.1
Nagaland	21	18	47.5	54.6	64.64	77.7	62.8	75.3
Sikkim	26	24	67.0	82.7	59.35	85.1	66.8	78.9
Tripura	29	28	45.0	58.1	77.93	84.6	69.7	84.9
All India	44	42	73.2	82.7	21.92	32.7	58.7	67.8

Source Economic Survey 2013–14; Ministry of Drinking Water & Sanitation, May 2012 Government of India

Gap in monthly income and expenditures determines the capacity of a household for investment. For India as a whole consumption constitutes 97% of income. In NER states the proportion varies from 59% (Meghalaya) to 128% (Tripura).

22.4.3 Multi-dimensional Aspects of Poverty

Poverty can also be described in terms of various socio-economic indicators, like Infant Mortality rate, Access to Safe drinking water, rural sanitation coverage, rural literacy, etc. In 2012 Infant Mortality Rate was highest in Assam and lowest in Manipur. In Arunachal Pradesh, the rate has increased than that in previous year (Table 22.13). The proportion of rural household with access to safe drinking water is highest in Sikkim and lowest in Meghalaya. Except Sikkim all NER states have lower proportion than India. Further, the proportion of rural household having sanitation coverage was highest in Manipur and lowest in Arunachal Pradesh. In terms of rural sanitation coverage, NER fared well than rest of the country. In terms of rural literacy, NER states (except Arunachal Pradesh) were above national average. Rural literacy was highest in Tripura (84.9%).

22.4.4 *Multi-dimensional Poverty Index*

Multi-dimensional Poverty Index (MPI)³ is an international measure of acute poverty, complementing traditional income-based poverty measures by capturing the severe deprivations with respect to education, health and living standards. MPI value '0' reflects no deprivation whereas '1' reflects extreme deprivation.

In NER, six States had MPI less than national average of 0.283. Assam and Meghalaya had higher MPI than national average. The MPI is lowest in Mizoram and highest in Assam (Fig. 22.4).

22.4.5 *Agriculture Vis-à-Vis Poverty in NER*

The discussions on agricultural growth and its impact on poverty in NER states reveals that the generalized cause and effect relationship in terms of performance in agricultural sector and poverty are indicative but more or less conform to the hypothesis of higher agricultural growth reduces the poverty faster.

Sikkim observed highest growth (9.8%) in GSDPA in NER which had the lowest poverty ratio. Higher cropping intensity and higher proportion of area under high-value food crops were the major sources of farm growth in the state. Higher share of wages, AH and NFS in the income of agriculture household in the state was indicative of faster growing agricultural economy and exhibited a faster reduction in poverty ratio from 30.9% to 8.2% between 2004–05 and 2011–12. Tripura, registering second highest growth in GSDPA among NER states, had similar pattern of agriculture including increase in area under oilseeds. Major source of income of agriculture household in Tripura was cultivation which had contributed to reduction in poverty more significantly in rural areas. These patterns were absent in Arunachal Pradesh which had 77% of GCA under food grains with little crops diversification to high value crops. The state also observed increase in poverty, with lowest rural sanitation coverage and rural literacy and relatively higher MPI value of 0.274. Further, operational holdings in the state were more concentrated in medium and Semi-medium categories. Meghalaya, which had substantial diversification of agriculture to fruits and vegetables, showed similar correlation of high farm growth and low-poverty ratio like Sikkim and Tripura. Whereas Nagaland, which had same rate of growth in agriculture as Meghalaya, did

³The Global Multidimensional Poverty Index (MPI), developed in 2010 by the Oxford Poverty & Human Development Initiative and the United Nations Development Programme, uses different factors to determine poverty beyond income-based lists. It replaced the previous Human Poverty Index. The proportion of the population that is multi-dimensionally poor is the incidence of poverty, or headcount ratio (H). The average proportion of indicators in which poor people are deprived is described as the intensity of their poverty (A). The MPI is calculated by multiplying the incidence of poverty by the average intensity of poverty across the poor ($MPI = H \times A$); as a result, it reflects both the share of people in poverty and the degree to which they are deprived.

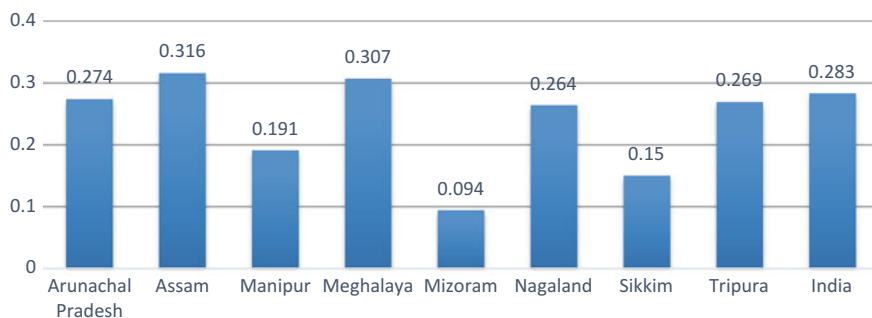


Fig. 22.4 Multi-dimensional poverty index. *Source* Oxford Poverty and Human Development Initiative (OPHI) Country Briefing June 2015: India

not experience reduction in poverty ratio, probably to be seen in the highly skewed distribution of land holdings towards medium and large farmers and consequently less inclusiveness in growth. In Assam, agricultural households had higher share and higher amount of income from cultivation which had experienced average diversification of cropping pattern to high value oilseeds, fruits and vegetables and growth of GSDPA at 3.8% which was reasonably well but lower than the all India average of 4.1%. The percentage of irrigated area was extremely low in Assam at 3.8% of GCA which could have constrained the growth of farm sector to less than potential. However, the impact on poverty was positive albeit marginally.

In Mizoram, although had good share of fruits and vegetables, the yield levels were very low and declining. The poverty ratio in the state was lower than the average at all India level and NER as a whole but had increased between 2004–05 and 2011–12 more sharply in rural poverty. The share of non-farm sector in the income of agricultural household was just 0.2%. Manipur had lowest growth of agriculture in NER and the highest poverty ratio. It had very low and declining yield level of food grains that occupied 68% of GCA.

22.5 Conclusions and Policy Implications

In the backdrop of the experience of growth in BRICS countries in terms of effectiveness of agriculture growth in reducing poverty as compared to growth in non-agricultural sectors this chapter examined effectiveness of agricultural growth in NER and its impact on poverty. State wise analysis of various agricultural parameters (viz. NSA, cropping intensity, irrigation, area, production and yield under food grains, high value crops and non-food crops, distribution of land holdings and share of agricultural labourer and cultivators) and multi-dimensional poverty indicators (viz. head count ratio, infant mortality, access to safe drinking water, coverage of rural sanitation, rural literacy, MPI, etc.) reveals that the

relationship in terms of growth in agriculture (measured in terms of GSDPA) and poverty (measured in terms of head count ratio) was on the expected lines. The hypothesis of high farm growth reduced poverty was true for Sikkim, Tripura, Meghalaya and Assam. High farm growth in Arunachal Pradesh and Nagaland was non inclusive and impact on poverty was not on expected lines. Mizoram, on the other hand, had high growth but depicts overdependence of rural working population on agriculture sector with negligible share of non-farm sector in the income of agricultural households. Manipur showed the lower agricultural growth and high poverty ratio conform to the hypothesis but in inverse direction.

Agricultural performance has more impact on head count ratio than MPI. States with high farm growth, viz. Tripura, Meghalaya and Assam did not fared well in MPI values. Sikkim had exception which was caused by diversification of rural income in NFS and AH. Mizoram though had poor performance in head count ratio performed well in terms of lowest MPI. Both Arunachal Pradesh and Nagaland failed to channel high farm growth in reducing poverty, both in terms of head count ratio as well as MPI, due to non-inclusiveness of growth.

States with high share of NFS and AH in monthly income of agricultural household had improving rural poverty. States with relatively more number of populations earning livelihood from agriculture showed increase in poverty. States with higher ratio of GSDPA to GSDP have relatively high MPI values. In these states, relative share of area under food grain is diminishing and high value crops are increasing. Irrigation coverage in NER needs to be expanded as it will have positive effect in expansion of area under high value crop and positive impact in agriculture growth.

Improving performance of agriculture needs to be emphasized to reduce poverty, both incidence and intensity of poverty. Among agricultural inputs, irrigation needs to be prioritised. In northeast India, ground water resources are under-utilized while blessed with sufficient rainfall, which offers scope to install a battery of shallow and deep tube wells to draw ground water during the rabi season. Efforts are to be made to increase in production and productivity of high value crops. Northeast states have skill and raw materials to engage for self-employment in weaving, pottery, cane and bamboo products, etc., and therefore, with the development of agri sector, NFS also to be stressed upon. Instead of adopting one size fit for all approach towards poverty alleviation, state specific problems are to be addressed and benefit of comparative advantages of each state needs to be reaped.

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