Chapter 1
Smart Metropolitan Regional Development: Economic and Spatial Design Strategies

T. M. Vinod Kumar

Abstract An overview view of smart metropolitan regional development is presented as a backdrop for research studies of this book. First, metropolitan region is defined followed by its form and functions. Then, smart metropolitan regional development is defined. The chapter studies the global metropolitan cities development and shows how metro cities, megacities and meta-cities are emerging across the world in Asia, Africa, Europe and America. Metropolitan cities are continuously exposed to external economic stimuli and requires intermediate range strategies as responses to face it. These periodic challenges of cities call for differing and flexible spatial and economic strategies to intervene in emerging global situation. By and large such strategy making dynamics is rare to be found and it is an important gap which this book address. To face these emerging metropolitan challenges, there is a need to design economic and spatial strategies at the intermediate time horizon. Therefore, this chapter concludes with a critical analysis of economic and spatial design strategies of 17 metropolises in their official plans which of course is long range plans.

Keywords Metropolitan development form and functions · Smart metropolitan development · Metro cities · Megacities and meta cities evolution globally Global cities · World cities · Official metropolitan development plan and economic and spatial strategies

1.1 Introduction

In 2016 as per UNHABITAT statistics, an estimated 54.5% of the world's population lived in urban settlements. By 2030, urban areas are projected to house 60% of people globally and a one in every three people will live in cities with at least half a million inhabitants. This larger city shows more propensity for higher

T. M. Vinod Kumar (✉)
School of Planning and Architecture, New Delhi, India
e-mail: tmvinod@gmail.com

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employment opportunities and higher income and better quality of urban infrastructure that drives people to move there. When more households in the world for example in India decide to transform from rural to urban households, by the change to non-primary urban occupation (that is the village males adopts secondary and tertiary sectors of the economy instead of the primary sector as per Indian Census); migration to cities, urbanisation progress and then larger urban agglomerations are formed [1, 2]. Because of the secondary and tertiary sector occupation and its propensity for generating higher income than farm income, Metropolitan cities world over shares a larger percent of Gross National Products than other cities of lower population range and rural areas. There are also potential in cities to increase this share for National Domestic Product than rural areas. Yet there has been less of effort to work out an economic strategy suited to the strength and weakness of specific metropolis that directly benefits the whole population of the metropolis, even its hinterland or the Nation. Against this requirements today economic policies of Nations are formulated largely based on non-spatial and non-regional economic policies as if economy resides in national input output tables.

Often in urbanisation, existing inhabitants are replaced with new immigrants creating social tension due to lack of employment opportunities to the early settlers with legacy skill sets. There are many more vital and well documented issues in these large cities in developing countries such as that of Lagos in Nigeria, Delhi and Mumbai in India, Jakarta in Indonesia and many one million plus cities which remains un addressed due to absence strategic interventions in economic and spatial aspects. This exploratory research seeks some answer to some of this question.

There has been an attempt to convert many metropolitan cities to smart cities, largely using selective investment strategies using public funds and procedural administrative rules arbitrarily not sanctioned or related to constitutionally designed institutions in limited part of cities with no clear economic, social and spatial rationales that fits into the overall metropolis in a particular location as related to global system of cities. In many smart city projects such as 100 smart city programs of India where only a very small and insignificant and population share of the city has been taken up for the smart city program and in many cases, it is status and elitist area of cities like New Delhi Municipals Corporation area in Delhi that get selected under a set of criteria postulated and not where low-income people live, or centres of significant economic development potential in metropolises that can elevate people to a better way of life and give opportunities to accumulate more household income that pays for smart city infrastructure. A good example is the 100 smart cities project of India. This approach is adopted mainly because the smart city is conceived as merely a demonstrative smart urban infrastructure investment project with no thought of how it can be financed and governed by citizen with the existing constitutional institutions, relevant legislations and internal finances. It is known that these cities by themselves cannot be able to generate its own higher and additional income to convert the entire city into smart cities with expensive ICT and IOT enabled smart city infrastructure. Further existing Governance system is bypassed with the imposition another temporary administrative structure as special purpose vehicle to implement the project defeating the constitutionally established

urban governance and city democracy. The existing urban plans as per the urban legislations of the respective states are not considered and largely ignored for smart city plan formulation weakening implementation of State level Town and Country Planning legislations. In short, the existing legitimate ecosystem of governance, democracy and planning system are bypassed in smart city programs. This book attempts to generate situation specific economic and spatial strategies that can convert the whole metropolitan region to smart metropolitan region. This will be defined subsequently in many chapters of this book which will not leave the earlier settlers with traditional occupations left out of the prosperity regime of smart metropolises. A societal and economic change will make these cities have their own smart infrastructure at their own expenditure and further strengthen the Governance capabilities as per constitution and existing legislations.

Spatial Plans are prepared for the metropolitan regional development to guide higher order infrastructure investment of the region. However spatial strategy that is integrated with the economic strategies which are inclusive of all sections of city population to transform them to a trajectory for household prosperity is not attempted in many of the Metropolitan Regional Plans. In short, metropolitan plans are to direct public investment, but no plan is prepared to charter people to prosperity, with profitable use the economic opportunities of the metropolis. Smart Community in a smart metropolis is fully capable of participating in a location and situation specific smart economy and build a smart city that is self-financing. Some of the studies will explore this possibility.

Designing economic and spatial strategies for Smart Metropolitan Regional Development shall be conducted by the spatially identifiable economic community at micro levels from time to time to suit the ever-changing scenarios of the global economic environment. However economic strategies may have a shorter lifespan than spatial strategies but both should fit in. Spatial strategies should be based on economic strategies each complementing the other. When this micro level communities cumulates to have a mega-community, they can make use of the vehicle of economic E-Democracy to formulate ever changing and dynamic strategies. E-Democracy for Smart Cities in this series of the book [3] discusses such issues, approaches and tools available for executing these designs of strategies.

1.2 Metropolitan Region

The term ‘metropolitan region’ is used to describe highly urbanised, city-regional areas that are characterised by a high population density as well as a concentration of economic, political and cultural activities [4, 5]. Furthermore, metropolitan regions form part of the interconnected city network and exhibit a specific governance structure that provides mechanisms of inter-jurisdictional cooperation between core cities and their hinterland. They constitute a link between the global network cities and locally embedded economic and social activities.

Brezzi, Monica; Piacentini, Mario; Sanchez-Serra, Daniel have studied the metropolitan form extensively [5]. While the urban area is the spatial form of the city, the metropolitan region, it has got a functional and economic form as studied by Burger, Meijers [6–8]. The spatial form is evident during the night when lights are on the metropolitan urban area and is visible from the sky while flying as continuous urbanised area with varying density of lighting. This area is unrelated to a municipal boundary, district boundary or even state and national boundary. The metropolitan region may be monocentric like Hyderabad or Bengaluru or polycentric like Mumbai or Delhi [7–9]. Urban area definition and terminology is developed by the national statistical authorities such as for example, the Census of India and the United Nations. They are at a liberty to use their own terminology and area definition. For example, Australia calls the urban area as urban centres, Canada Population centre, Denmark, Finland, the Netherlands, Norway, Sweden, and the United States calls it urban Area, United Kingdom the built urban area while India and the United Nations called it Urban Agglomerations in last few Indian censuses. A metropolitan area may include more than one urban area. For example, the Los Angeles metropolitan area includes several urban areas, such as Los Angeles, Riverside-San Bernardino, Mission Viejo, Santa Clarita, Simi Valley, Oxnard-Ventura, and Palm Springs. The United States designates combined statistical (metropolitan) areas, which are routinely used, as opposed to their smaller metropolitan statistical area (MSA) components. Some but not most nations formally designate metropolitan areas (such as the United States, France, Brazil, India, Argentina, and Canada). Caution is appropriate with respect to the term. Other countries have their own definition. A term “Greater” is often used to denote a metropolitan area, such as “Greater Los Angeles”, “Greater Mumbai” or “Greater Chicago.” Again, this term is imprecise, because it is also used in some situations to denote municipalities that are only a part of a metropolitan area as defined by Indian census or UNHABITAT. For example, the municipality of Mumbai is formally called the Municipal Corporation of Greater Mumbai and does not encompass the entire metropolitan area as defined by Indian Census. There is considerable confusion over the term “city” and urban terms, such as “urban area” and “metropolitan area”. By its very nature, urbanisation in both the spatial sense and the economic sense is not defined by the borders of single municipalities, large or small. There is a requirement for standardisation of metropolitan areas definition jointly perhaps by a United Nations body to help the cause of scientific integrated metropolitan development.

Global Cities are not new but have been discussed by Saskia Sassan since the 1990s [10, 11]. Four functions that characterise metropolitan regions in the context of globalisation are,

1. innovation and competition
2. decision-making and control
3. gateway
4. symbol or branding.

World cities are identified as the control centres of the global capital flow, describing metropolitan regions based on a range of specialised metropolitan functions; and global cities or global city-regions as control centres and centres for the creation and marketing of business-orientated, knowledge-intensive services, and linkages between knowledge-intensive services as an indicator for analysing the rank and function a city occupies within the world city network [12, 13].

If a city also performs an important commercial, cultural and political function for its region or even the whole country can graduate to a global metropolis. Such a major importance can usually be assumed for cities boasting some 500,000 inhabitants or more as in the case of Europe and one million plus in India and other developing countries. On the other hand, Global cities are those selected few metropolises whose political, cultural and commercial influence extends across the entire globe (e.g. New York City, Tokyo or London). A metropolis is considered as a city which agglomerates major functions of coordination of complex activities and which fulfils these functions at a world scale [14]. Although the definitions highlight that the term 'metropolis' is to some extent like the concepts described above, it is both less clear and less focused on economic or social change. Furthermore, the metropolis concept fails to define the spatial extent of this type of city. Given the existence of functional relationships between these cities and their hinterlands or polycentric conurbations.

As social spaces, metropolitan areas or regions can be characterised by the following four dimensions: Metropolitan regions are defined as an accumulation of metropolitan facilities including public and private services. In terms of actors and actions, metropolitan regions constitute an arena for key regional stakeholders to exchange knowledge on joint regional objectives, strategies and projects, as well as on the necessary organisational structures. In the context of spatial development, metropolitan regions are a normative and guiding concept intended to contribute to innovation, creativity and economic growth. About the symbolic dimension of urban and regional development, metropolitan regions are the medium of symbols, norms and values which convey aspects associated with the metropolis and urbanity.

1.3 Smart Metropolitan City/Region

The term smart metropolitan region is rarely used. It calls for a definition. Authors of the book "Geographic Information System for Smart Cities" examined several definitions of smart cities and were not satisfied and came out with their own definition. I feel this definition can be used in this book [15].

> The smart metropolitan (centre/area/region) city is a knowledge-based city that develops extraordinary capabilities to be self-aware, functions 24 h and 7 days a week, communicate, selectively, knowledge in real time to citizen end users for a satisfactory way of life, with easy public delivery of services, comfortable mobility, conservation of energy, environment and other natural resources, and creates energetic virtual face to face communities and a vibrant urban economy even at time of national economic downturns.

All six components of smart cities such as Smart Economy, Smart People, Smart Governance, Smart Mobility, Smart Environment and Smart Living is integrated and implied in this definition which has been presented in detail in the four books of this series by the Author [3, 16–18]. The importance of E-Democracy and use of technology and innovative entrepreneurship will be the prime mover of the smart metropolitan regions which is the subject matter of one book in this series [3]. Smart Metropolitan (Regional) Development has not been tried extensively and this book will be an attempt to do so.

1.4 Functions of Metropolitan Regions in Global-Place-Competition

The concept global economy with partnership and division of labour of global network of cities is not new, but those who talk about a globalised economy insist that there have been distinct changes in its structure and modes of production [19]. Whereas earlier economic activities crossed national boundaries ("internationalisation"), globalisation includes a deeper integration, where transnational corporations orchestrate production from various locations. The term also includes other factors [20]. Global places indicate a rising of networked society globally [21] which can work effectively in a smart metropolis with high endowments of ICT and IOT.

One author boils globalisation and Global Urbanisation down to five basic elements [22]:

(1) "new innovative technology,
(2) the centrality of information made possible by instant communication,
(3) an increasing trend toward the standardisation of economic and social products,
(4) growing cross-national integration, and
(5) mutual vulnerability stemming from greater interdependence" [23].

As far as the decision-making and control function of metropolitan regions is concerned, the focus is to ensure the presence of those centres capable of steering international activities in business and politics [24]. In global place competition, these centres provide the region with greater influence and access to necessary networks. The current distribution of decision-making and control functions is not only the result of decisions made in the past, but also of specific conditions which have affected business locations over time. As soon as the number of control centres in a metropolitan region (e.g. corporate headquarters, ministries or international organisations) exceeds a critical mass, the importance of physical proximity induces a self-reinforcing process.

About the innovation and competition function, a similar picture is observable. The greater the importance of the knowledge economy, the greater the competitive edge of metropolitan regions as preferred locations for both national and international customers is. Among other things, increasing levels of efficiency enhance the attractiveness of locations for knowledge bearers, knowledge producers and creative

individuals. In the knowledge sector, the risk of a 'brain drain' and the resulting loss of highly skilled labour is not to be underestimated. This can only be achieved by the instituting smart living which is one of six component of smart cities.

When it comes to integrating metropolitan regions into international and global flows, the gateway function is by far the most important. Alongside its focus on the efficiency of various infrastructure types (primarily of transport nodes), this function targets the ability of a metropolitan region to function as a 'gateway to the world' when it comes to the exchange of and access to, services, information, knowledge, ideas and opinions [25]. Given that metropolitan regions are the gateway for both in- and out-migration, they are the places where diverse cultures and lifestyles come together. Thus, the way in which these encounters can be harnessed for the region's development constitutes an additional indicator of the efficiency of metropolitan regions.

The efficiency of metropolitan regions can also be measured by the extent to which they succeed as key sources of sign and symbol production. Rather than focusing on the current trend towards essentially interchangeable festivals and events, this function focuses on a credible and unmistakable sense of uniqueness at the international level. This is particularly prevalent in milieus that are not only shaped by the nodal function of metropolitan regions in global networks, but also by the specific traditions, experiences and resources created by regional actors. The strength of these metropolitan images ('spatial brands') in global place competition increases the more they are based on an equal balance of economic, socio-cultural, spatial/physical and historical components, and the more they are 'lived' and borne by people in the region (creative individuals, 'ambassadors', etc.).

1.5 Metro Cities, Mega City and Meta-City

While many countries have their own definition related to the population of metro cities, metro cities are defined as 1 million plus agglomeration by the UN and the Indian Census. Considering increasing levels of urbanisation, the United Nations defined the 'mega-city' as a new population dependent category in 2012 with 10 million plus population. In 2011, 23 urban agglomerations qualified as megacities because they had at least 10 million inhabitants. Alongside the category 'megacity', UN-Habitat introduced the term [26] 'Meta city' which describes 'massive conurbations of more than 20 million people or above'. Termed by some as 'hyper cities', cities with more than 20 million inhabitants constitute a new type of settlement above and beyond the scale of megacities. Driven by economic development and rising population numbers, they gradually swallow rural areas, cities and towns, thus becoming single, yet multi-nuclear entities. Meta cities are conurbations of more than 20 million people, mega cities are 10 million population or above and metropolitan cities 1 million and above. These meta-cities speak of human vibrancy, an innovative and entrepreneurial spirit and commercial dynamism as discussed in earlier para. Side by side there is mounting issues such as

environmental, transport, income equality, Governance and so on. These meta-cities comprise of people striving for more economic opportunities, better freedom and a bigger voice at the same time facing an increasing amount of urban issues and challenges. The area from Hong Kong to Shenzhen to Guangzhou (a region in South China that is 26 times larger than Greater London) is home to over 120 million people and a massive manufacturing base. A 932-mile Indian industrial corridor being developed between the cities of Mumbai and Delhi under construction may have a big population and bigger economic opportunities befitting a meta-city. Nigeria's Lagos, the fastest growing megacity in the world, is expanding at more than five percent a year with all its difficult urban issues heralding a beginning of a meta-city. Tokyo the largest meta city in the world is a good example of all attributes of a meta-city. Since ICT drives the mega city and meta city formation, these cities are smart cities in making.

1.6 Urban Agglomerations

These urban agglomerations called mega cities and meta cities, many of which accommodate populations larger than entire countries, are a truly unprecedented phenomenon and merit greater attention.

A map of countries by population range is shown in Fig. 1.1.

It can be seen that Population of Canada is 36,511,11 as on 2017 but that of meta city Tokyo is 38,241,000 in 2017. Similarly, there are many Nations smaller than meta-cities and mega cities in the world as shown above on the map.

Case studies from India, Africa, Europe, China and the United States are covered in this book. A comparative statement on India, China and the US for 2010 is presented below although 2011 census of Indian figure is available. This is meant to act as a background to case studies. Statistical data on size distribution, percent

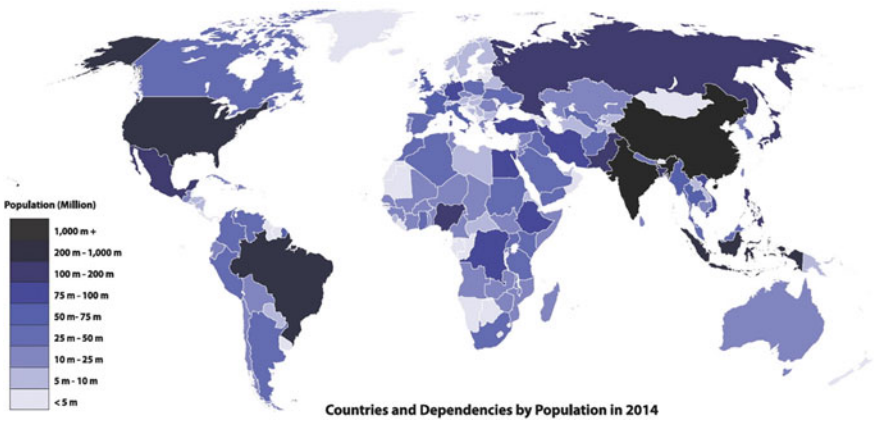

Fig. 1.1 Countries and population range 2014

urban growth rate of India, China and USA are as given below. Urban Population as a percentage of total Population by regions in 1970, 2000 and projection for 2015 is as given below. It can be seen that while North, Central and South America are reaching saturation points in urbanisation, there is much to catch up in Africa and Asia (Fig. 1.2).

In 2016, there were 512 cities with at least 1 million inhabitants (metropolitan centre/region/cities) globally. By 2030, a projected 662 cities will have at least 1 million residents. As hubs of trade, culture, information and industry, they will be vested with such power that at many levels they will act as city states that are independent of national and regional mediation. Today mega cities are home to less than 10% of the global urban population. In 2016, there were 31 megacities globally and their number is projected to rise to 41 by 2030. These 31 megacities by region are colour coded in the following Fig. 1.3 as per the region they belong to.

The list of megacities is given below for 2016 and projected 2030 by UNHABITAT in Table 1.1. There were eight meta cities above 20 million in 2016 in the universe, which is likely to be twice about 15–16 in number or little less in 2030 which may be considered as accelerated graduation of mega cities to meta cities. However, the number of mega cities increase during this period which includes meta cities were from 31 to 41 which is not as impressive as that of the meta-cities. Indian census defines urban agglomeration which UNHABITAT define as cities but there was no attempt to classify these urban agglomerations as

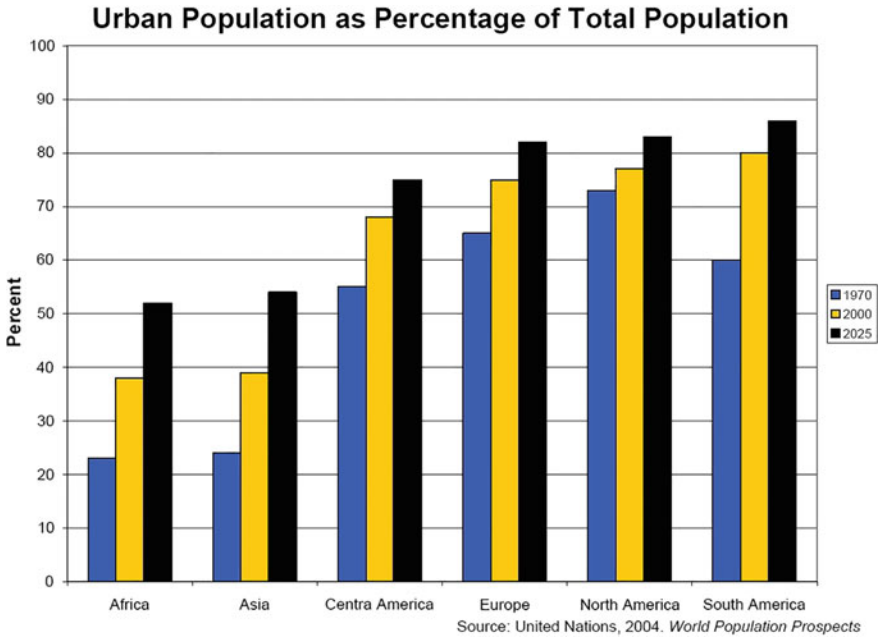

Fig. 1.2 Urban population growth 1970–2025 by geographic regions

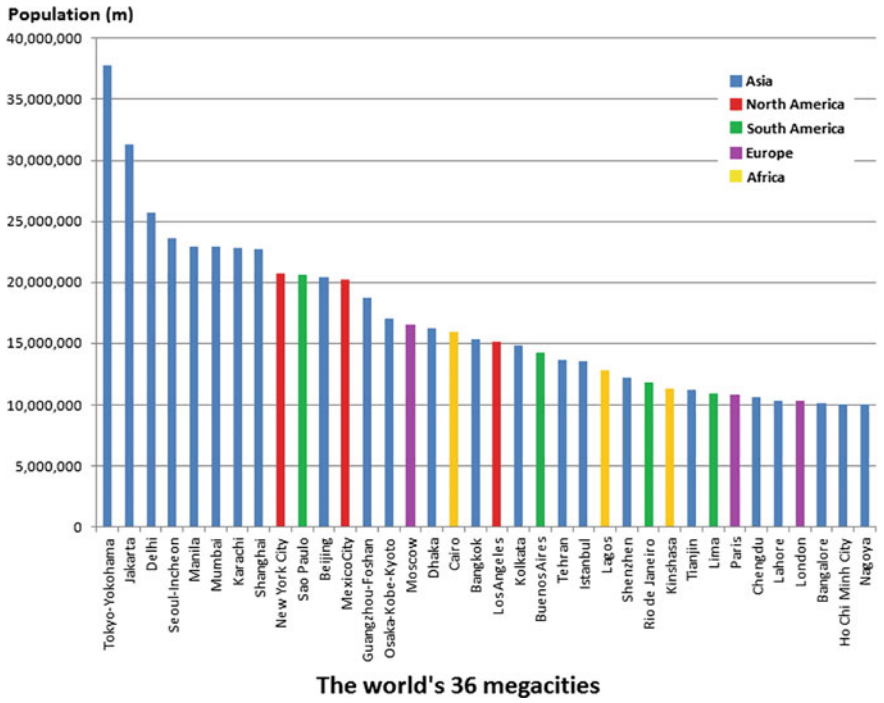

Fig. 1.3 Meta and megacities of the world by population and regions

meta-cities and megacities in Indian Census since it cuts across several districts as if there is a wall around districts for Indian Census. If you map using census town data of five metropolises namely Kannur–Kozhikode–Malappuram–Trissur–Kochi, there is already a megacity of 10 million plus population in 2016. In the northern part of Kerala, and Salem–Coimbatore another mega city in Tamil Nadu. Also, Indian census do not delineate metropolitan regions as against non-metropolitan districts although these are recognised constitutional areas as per 74th constitutional amendments. As can be seen there has been no special treatment in designing economic and spatial strategies of megacities and meta-cities which is a debatable point of view. No clear research on meta city functions and megacities functions as opposed to functions of metropolitan cities exist today.

As stated above, there is also the Metacity, or hyper city, an epithet that refers to massive sprawling conurbations of more than 20 million people. Tokyo became the first hyper city in the mid-1960s when it crossed the 20 million population thresholds. Today it is the largest meta-city in the world. Tokyoites—more than 35 million—outnumber Canadians. By 2020, Mumbai, Delhi, Mexico City, Sao Paulo, New York, Dhaka, Jakarta and Lagos all will have achieved meta-city status, someone dozen to fifteen meta-cities as per the listing above. These metropolises are so huge that they have changed the dynamics of urbanisation. People commute to work in meta/megacities from densely populated outlying villages or suburbs.

Table 1.1 Meta-cities and megacities of 2016 and 2030

Rank	City, Country	Population in 2010 (thousands)	Rank	City, Country	Population in 2030 (thousands)
1	Tokyo, Japan	36,140	1	Tokyo, Japan	37,190
2	Delhi, India	26,454	2	Delhi, India	36,060
3	Shanghai, China	24,484	3	Shanghai, China	30,774
4	Mumbai, India	21,357	4	Mumbai, India	27,797
5	Sao Paulo, Brazil	21,297	5	Beijing, China	27,706
6	Beijing, China	21,240	6	Dhaka, Bangladesh	27,374
7	Mexico City, Mexico	21,157	7	Karachi, Pakistan	24,838
8	Osaka, Japan	20,337	8	Cairo, Egypt	24,502
9	Cairo, Egypt	19,128	9	Lagos, Nigeria	24,239
10	New York-Newark, USA	18,604	10	Mexico City, Mexico	23,865
11	Dhaka, Bangladesh	18,237	11	Sao Paulo, Brazil	23,444
12	Karachi, Pakistan	17,121	12	Kinshasa, Democratic Republic of Congo	19,996
13	Buenos Aires, Argentina	15,334	13	Osaka, Japan	19,976
14	Calcutta, India	14,980	14	New York-Newark, USA	19,885
15	Istanbul, Turkey	14,365	15	Calcutta, India	19,092
16	Chongqing, China	13,744	16	Guangzhou, Guangdong, China	17,574
17	Lagos, Nigeria	13,661	17	Chongqing, China	17,380
18	Manila, Philippines	13,131	18	Buenos Aires, Argentina	16,956
19	Guangzhou, Guangdong, China	13,070	19	Manila, Philippines	16,756
20	Rio de Janeiro, Brazil	12,981	20	Istanbul, Turkey	16,694
21	Los Angeles-Long Beach-Santa Ana, USA	12,317	21	Bangalore, India	14,762
22	Moscow, Russian Federation	12,260	22	Tianjin, China	14,655
23	Kinshasa, Democratic Republic of Congo	12,071	23	Rio de Janeiro, Brazil	14,174
24	Tianjin, China	11,558	24	Chennai (Madras), India	13,921
25	Paris, France	10,925	25	Jakarta, Indonesia	13,812
26	Shenzhen, China	10,828	26	Los Angeles-Long Beach-Santa Ana, USA	13,257
27	Jakarta, Indonesia	10,483	27	Lahore, Pakistan	13,033
28	Bangalore, India	10,456	28	Hyderabad, India	12,774
29	London, UK	10,434	29	Bogota, Columbia	12,673

(continued)

Table 1.1 (continued)

Rank	City, Country	Population in 2010 (thousands)	Rank	City, Country	Population in 2030 (thousands)
30	Chennai (Madras), India	10,163	30	Paris, France	12,221
31	Lima, Peru	10,072	31	Moscow	12,200
			32	Bogota, Columbia	11,966
			33	Paris, France	11,803
			34	Jonesburg, South Africa	11,573
			35	Bangkok, Thailand	11,528
			36	London, UK	11,467
			37	Dar es Salam, Tanzania	10,760
			38	Ahmedabad, India	10,527
			39	Luanda, Angola	10,429
			40	Ho Chin Min city, Vietnam	10,200
			41	Chengdu, China	10,104

Source United Nations, Department of Economic and Social Affairs, Population Division (2016). The World's Cities in 2016—Data Booklet (ST/ESA/SER.A/392)

City centres stagnate as the economic base shifts outwards to peri-urban areas that are more attractive but less well regulated. Secondary cities and city systems become interconnected through manufacture and other business enterprises. Meta cities and Megacities are a key to globalisation, a state of interconnectedness around the globe that transcends and largely ignores national boundaries. Global urban economies rely on advanced producer services such as finance, banking, insurance, law, management consultancy, advertising and other services. The technology revolution has made it possible for business enterprises to hire these services anywhere in the world. There is no America First or Brexit impact on that and it has to continue if cities wants to retain the status as meta, mega and metro cities in the global network of cities in any part of the world.

Urban Growth the world's largest cities are given below. Thirty-six large mega and meta-cities by geography are also given in Fig. 1.3.

Asia leads in the number of megacities leaving far behind other regions such as Americas, Europe and African and there are 8 largest mega-cities are all in Asia. Further barring Moscow, all Europe mega cities are of smaller size. With urbanisation reaching almost saturation and lower population growth, it is unlikely these trends cannot change.

Urban growth in some largest cities in the world is given below. Growth rates of Asian large cities are much higher than that in the other regions which substantiate further the earlier statement (Fig. 1.4).

In 2016, 45 cities had populations between 5 and 10 million inhabitants. By 2030, 10 of these are projected to become megacities. UN Projections indicate that

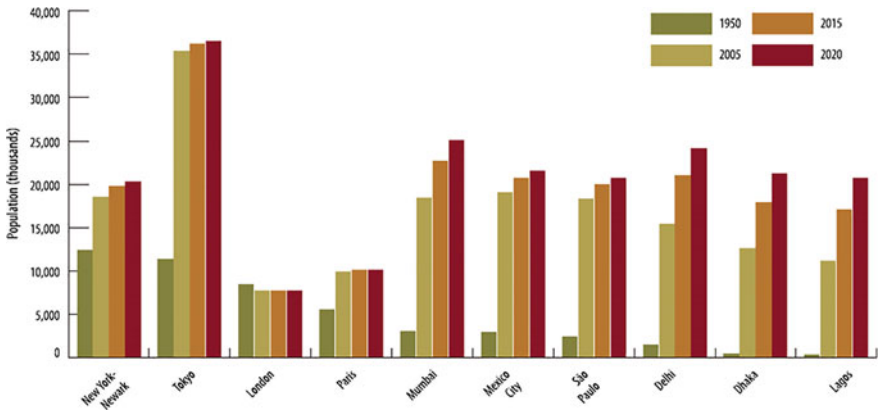

Fig. 1.4 Urban growth in the world's largest cities 1950–2020. *Source* United Nations, World Urbanization Prospects: The 2003 Revision. *Note* Population in 2020 was established in 2010 and 2015 assuming that trends for these years remain the same

29 additional cities will cross the 5 million marks between 2016 and 2030, of which 15 are in Asia and 10 in Africa. In 2030, 63 cities are projected to have between 5 and 10 million inhabitants. Megacities in 2016 and 2030 are given below.

An overwhelming majority of the world's cities have fewer than 5 million inhabitants. In 2016, there were 436 cities with between 1 and 5 million inhabitants and an additional 551 cities with between 500,000 and 1 million inhabitants. By 2030, the number of cities with 1–5 million inhabitants is projected to grow to 559 and 731 cities will have between 500,000 and 1 million inhabitants.

Mega-cities population were projected from 2016 to 2030 is given in Fig. 1.5. It can be seen again that Tokyo is slowing down while Delhi is growing faster and may overtake Jakarta approaching the second position. Many of the Asian cities and one African city Lagos are growing at much faster rate than European and American cities. If mega cities represent the economic hub of the future it is shifting towards Asia from America and Europe. Integrated spatial and economic strategies can help this transition. This is the subject matter of this book. As per the current trend GDP growth rate in Asia is much higher than Europe and Americas and it is likely to continue for few decades. It looks like an Asian and African era is emerging.

Growth rates of many mega cities in Asia and some in Africa are growing at higher rate than elsewhere.

In Table 1.2 Morphology of urbanisation of China, India and USA is compared. It is given here because this book carries case studies from these regions.

The largest urban population is in China followed by India and US. The total urban population in India is higher than the US. The percent of the urban population in mega cities in India are more than US and China in that order.

The population distribution of India and China are further studied in the following figures. China has all its metro and mega cities in the East facing the sea leaving a vast stretch in the western area without mega, meta and metro cities. China is fast moving towards a one billion urban population as shown in Fig. 1.6 by 2030.

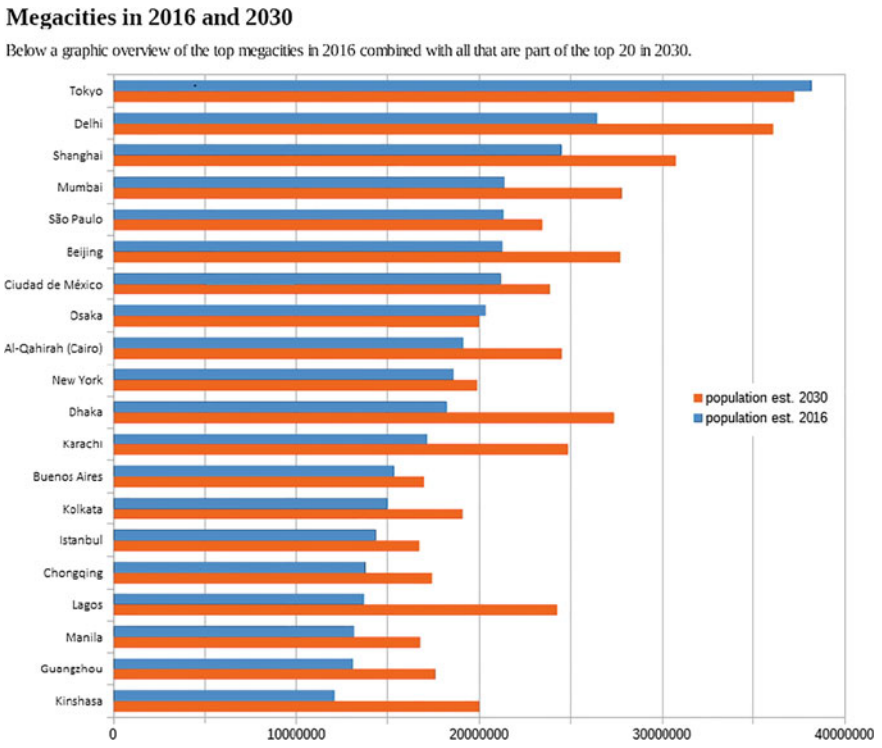

Fig. 1.5 Megacities population 2016 and 2030. *Source* United Nation, Department of Economic and Social Affairs, Population Division (2014). World Urbanization Prospects: The 2014 Revision

Table 1.2 Morphology of urbanisation India, China and USA 2010

Population size category of towns	% in urban population in 2010		
	India	China	United States
10 million or more	15	8	13
5–10 million	8	10	10
1–5 million	17	23	34
500,000–1 million	9	15	10
Fewer than 500,000	52	44	33
Total urban population (in 0000)	378,775	660,286	254,959
% urban population	30.9	49.2	82.1
Urban annual growth rate (%) 2005–2010	1.56	3.44	1.24

Source Population division of economic and social affairs of the United Nations secretariat, world population prospect. The 2010 revision and world urbanization prospects. The 2011 revisions 2014

Fig. 1.6 Million plus city clusters in China 2010 and its transformation in 2030

In China, there are 655 cities, out of which 160 cities are 1 million and above which is more in number than India, 12 cities with a population of above one million to 5 million and 8 cities above 10 million population (megacities) by 2025 namely Beijing, Shanghai, Chengdu, Guangzhou, Shenzhen, Tianjin and Wuhan.

There is a large body of literature on Metropolitan development in India [27–34]. No attempt is made here to review of this literature but the data from these references is presented to showcase the momentum of metropolitan development in India. The growth of statutory towns and census towns in India for 2001 and 2011 is given below. It can be seen from the table below that the growth rate of census towns increased when compared with statutory towns (Table 1.3).

There were practically no immigrations to these census towns but showed a change in occupational pattern, (predominantly higher percent of non-agricultural in urban male occupation) and higher gross density, and several cases the population above 5000. The Urban situation of India from 1901 to 2011 is given below and several Urban Agglomeration and statutory towns in 2001 and 2011. The compound annual growth rate of urban growth has been fluctuating but India reached 31.2% urban in 2011 (Tables 1.4, 1.5 and Fig. 1.7).

Break up of cities in India which include 3 mega cities Delhi, Mumbai and Kolkata and remaining metro cities is given in Table 1.6. Further urban settlements and metro cities in 2011 are also given below. Among the urban population, the largest percent people in India live in megacities which are more than 10 million population (Fig. 1.8).

Table 1.3 Indian statutory and census towns in 2001 and 2011

Type of towns/UAs/OGs	Number of towns	
	2001	2011
Statutory towns	3799	4041
Census towns	1362	3894

Source Census of India 2001 and 2011 registrar general of census

Table 1.4 Urban situation in India 1901–2011

Census years	Number of towns/ UAs	Cities with population of 1 lakh and above	Urban population (in millions)	% urban population	Urban annual exponential growth rate
1901	1827	24	26	10.8	–
1911	1815	21	26	10.3	0.03
1921	1949	27	28	11.2	0.79
1931	2072	33	34	12.0	1.75
1941	2250	47	44	13.9	2.77
1951	2843	71	62	17.3	3.47
1961	2365	95	79	18.0	2.34
1971	2590	139	109	19.9	3.23
1981	3378	204	159	23.3	3.79
1991	4689	273	217	25.7	3.11
2001	5161	350	285	27.8	2.74
2011	7935	468	377	31.2	2.76

Source (i) Computed from Census of India 1991, Part-II A (ii) Towns and urban agglomerations classified by population in 1991 with variation since 1901 (iii) Census of India 2011, final population totals, registrar general of India. New Delhi

Table 1.5 Growth of metropolises in India 1901–2011

Census years	Number of metropolises	Population in millions	Decadal increase (%)	Population of metropolises as percentage of India's total population	Population of metropolises as percentage of India's total urban population
1901	1	1.5		0.6	5.8
1911	2	2.8	82.8	1.1	10.7
1921	2	3.1	13.4	1.3	11.1
1931	2	3.4	8.9	1.2	10.2
1941	2	5.3	5.7	1.7	12.0
1951	5	11.8	21.3	3.3	18.8
1961	7	18.1	54.0	4.1	22.9
1971	9	27.8	53.8	5.1	25.5
1981	12	42.1	51.3	6.2	26.4
1991	23	70.7	67.8	8.4	32.5
2001	35	107.8	52.8	10.5	37.0
2011	52	159.6	48.9	13.2	42.3

Source (i) Computed from Census of India 1991, Part-II A (ii) Towns and urban agglomerations classified by population in 1991 with variation since 1901 (iii) Census of India, 2011. Final population totals, registrar general of India, New Delhi

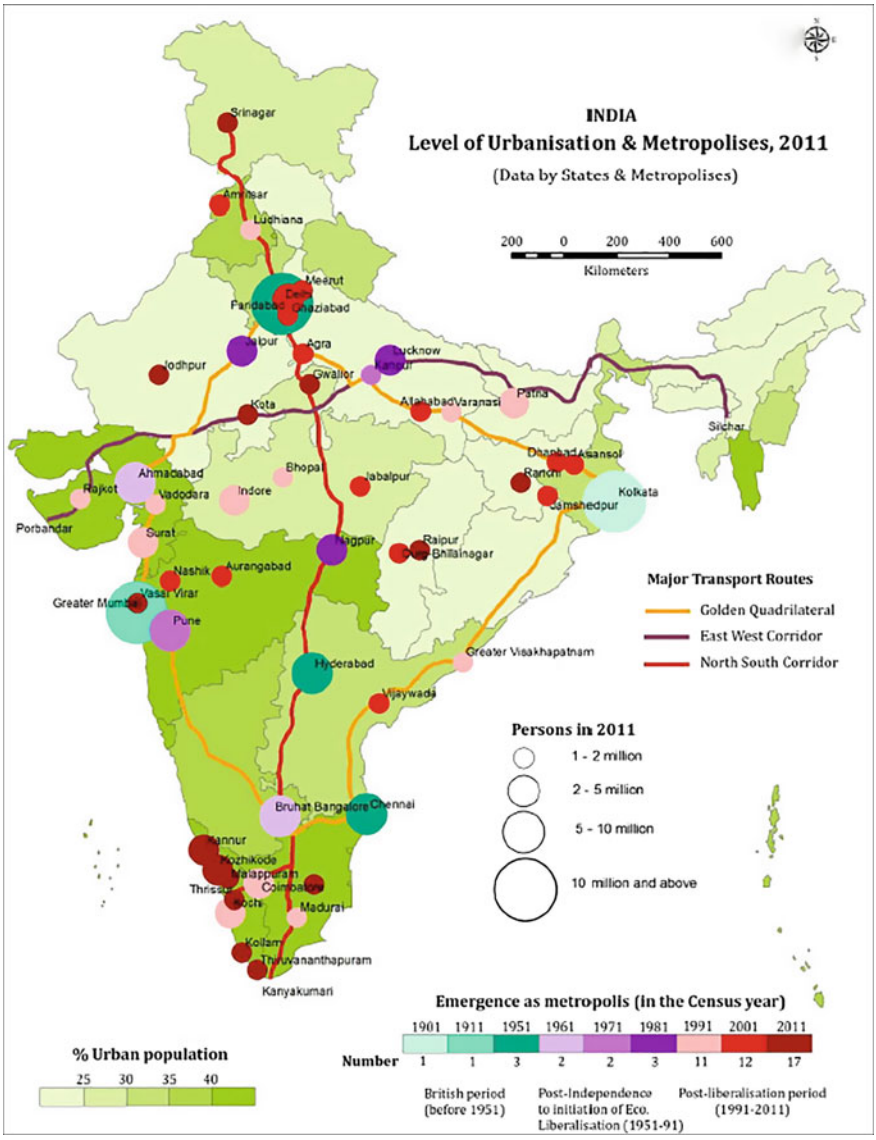

Fig. 1.7 Levels of urbanisation and metropolises in India 2011. *Source* Kumar [34]

Figure 1.8 represents the towns and cities in 1991 and number of metropolitan areas in 2011 in India. It can be seen unlike China the western part of India has more megacities and metropolitan cities than the eastern part. There is also near equitable distribution of mega and metro cities all around the Indian Union, unlike China.

Table 1.6 Configuration of metropolises in India (2011 Census)

State/Union Territory	Metropolises	No. of metropolises	Population of metropolises	State urban population	State % urban population	% share of metropolises
Kerala	Kochi UA, Kozhikode UA, Thrissur UA, Malappuram UA, Thiruvananthapuram UA, Kannur UA, Kollam UA	7	12,139,860	15,934,926	47.7	76.2
Uttar Pradesh	Kanpur UA, Lucknow UA, Ghaziabad UA, Agra UA, Varanasi UA, Meerut UA, Allahabad UA	7	14,025,098	44,495,063	22.3	31.5
Maharashtra	Greater Mumbai UA, Pune UA, Nagpur UA, Nashik UA, Vasai Virar (M.Corp.), Aurangabad UA	6	29,927,857	50,818,259	45.2	58.9
Gujarat	Ahmedabad UA, Surat UA, Vadodara UA, Rajkot UA	4	14,161,800	25,745,083	42.6	55.0
Madhya Pradesh	Indore UA, Bhopal UA, Jabalpur UA, Gwalior UA	4	6,428,127	20,069,405	27.6	32.0

(continued)

Table 1.6 (continued)

State/Union Territory	Metropolises	No. of metropolises	Population of metropolises	State urban population	State % urban population	% share of metropolises
Tamil Nadu	Chennai UA, Coimbatore UA, Madurai UA, Tiruchirappalli UA	4	13,278,580	34,917,440	48.4	38.0
Andhra Pradesh	Hyderabad UA, Vishakhapatnam (M.Corp.), Vijayawada UA	3	10,882,077	28,219,075	33.4	38.6
Jharkhand	Jamshedpur UA, Dhanbad UA, Ranchi UA	3	3,662,372	7,933,061	24.0	46.2
Rajasthan	Jaipur (M.Corp.), Jodhpur UA, Kota (M.Corp.)	3	5,186,157	17,048,085	24.9	30.4
Chhattisgarh	Raipur UA, Bhilainagar UA	2	2,187,780	5,937,237	23.2	36.8
Punjab	Ludhiana (M.Corp) Amritsar UA	2	2,802,428	103,991,346,375	37.5	26.9
West Bengal	Kolkata UA, Asansol UA	2	15,301,405	29,093,002	31.9	52.6
Bihar	Patna UA	1	2,049,156	11,758,016	11.3	17.4
Haryana	Faridabad (M.Corp.)	1	1,412,050	8,842,103	34.9	16.0

Source Census of India 2011, final population total, registrar general of India, New Delhi
Note M.Corp—Municipal Corporation

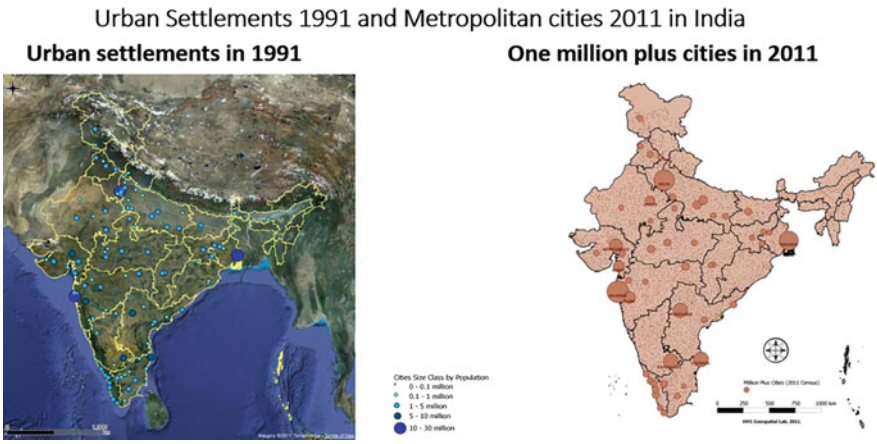

Fig. 1.8 The spatial distribution of urban settlement in 1991 and metropolitan and mega cities in 2011 in India

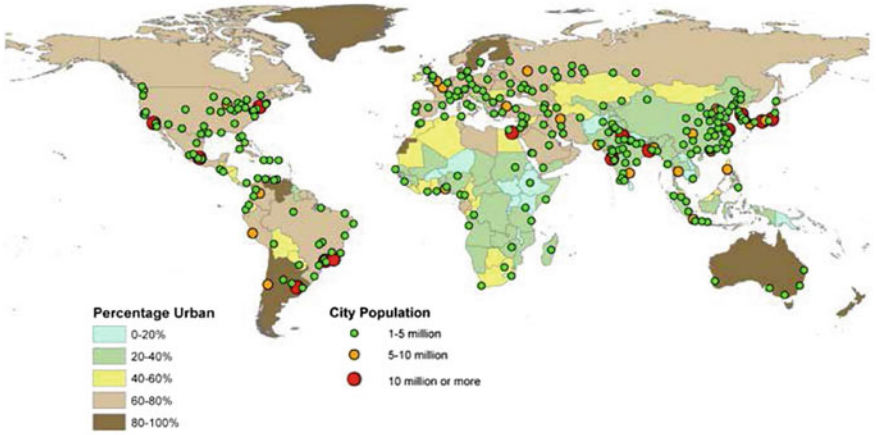

Fig. 1.9 Global pattern of urbanisation and large cities development in 1995. *Source* UNHABITAT (2016), World Cities Report (2016)

The global urbanisation and cities development is given in these two maps. It shows levels of urbanisation and settlement development 1995 and 2015 of metro cities and mega-cities as per UN statistics (Fig. 1.9).

Figure 1.10 gives Growth Rates of Urban Agglomerations in 2011–2025.

Figure 1.11 gives the spatial pattern of one million cities and above in 2015. Mega cities are more growing in Asia than Europe, Americas and Africa. These mega-cities have the capability to generate more per capita GDP. The rate of projected growth of Urban Agglomeration by size in the world is given below for the period 2011–2025 which substantiate the earlier statement.

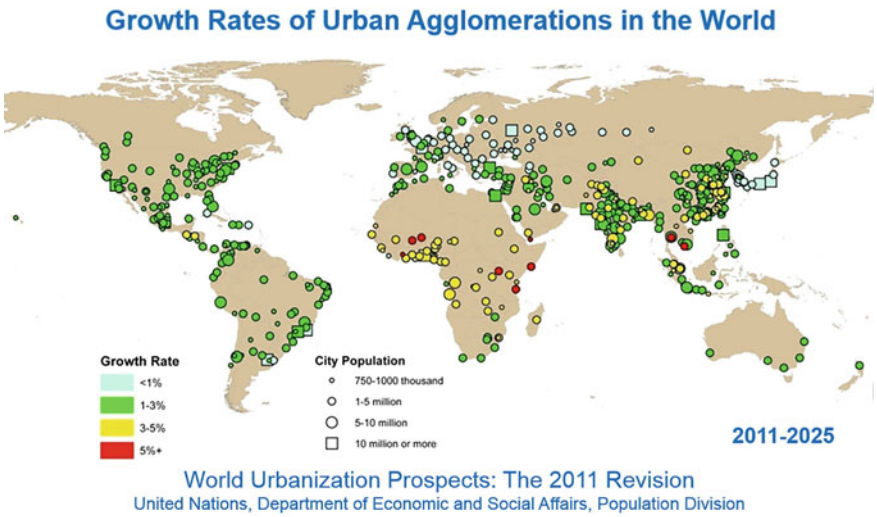

Fig. 1.10 Growth rates of urban agglomerations in 2011–2025

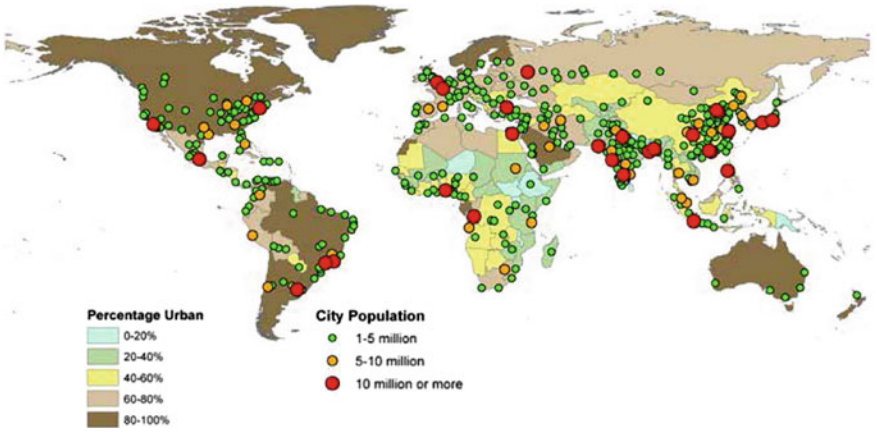

Fig. 1.11 Global patterns of urbanisation and large cities development in 2015. *Source* UNHABITAT (2016), World Cities Report (2016)

The following maps give how these growing urban agglomerations are connected there in the developed and developing the world. There are already networks and corridors cutting across the boundary of nations which has given rise to the formation of urban settlements in 2016 as given above in a globalised world. I am leaving to the readers to study these maps and establish the relationship of the emerging urban settlement morphology at the global level (Fig. 1.12).

Fig. 1.12 Urban networks

1.7 National GDP Share of Mega and Meta-Cities

Often the share of GDP produced in this mega and meta-city are considerable in comparison to total National GDP. The two graphs give how it varies in some selected cities. Figure 1.13 Share of GDP and National Population in Selected Developed Countries Cities. The graphs are self-explanatory (Fig. 1.14).

Table 1.7 arrange in the descending order, projected GDP 2025 of top 30 Urban Agglomeration and compute average real GDP/population growth rate projected during 2008–2025. This shows that GDP/population growth rates of largest 30 urban economies in the universe are generally low but there is few exceptions in the south and eastern urban agglomeration marked in Table 1.7.

Table 1.8 tabulates under descending order of high GDP growth rate of first 30 urban agglomerations by GDP growth rate 2008–25 and then cities are organised by

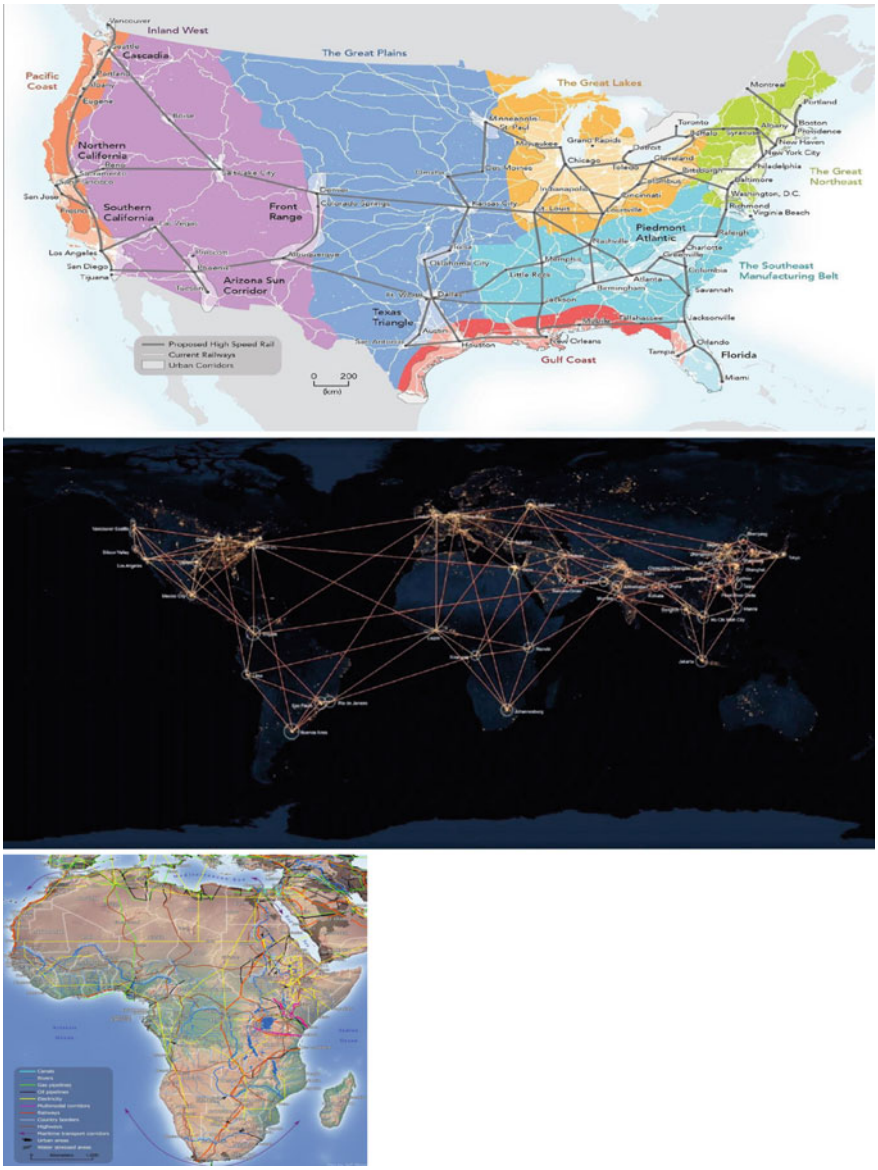

Fig. 1.12 (continued)

countries and found that these urban agglomerations are all in Asia and Africa. It can be seen the higher GDP performance cities are in large number in India followed by China and other countries. This justifies a maximum number of case studies in this book from Asia and Africa.

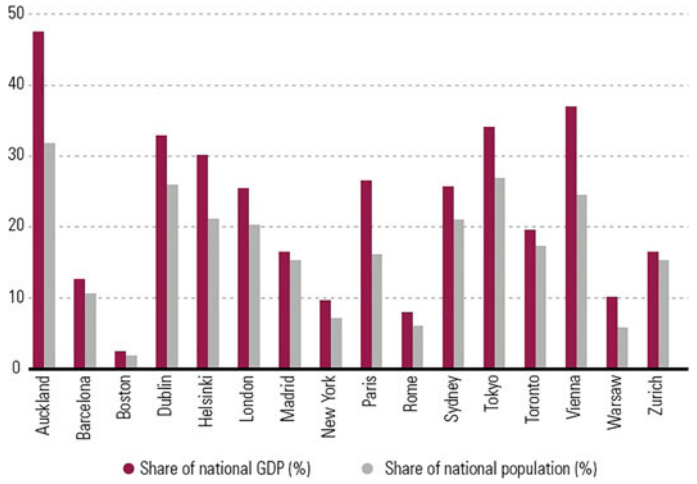

Fig. 1.13 Share of GDP of metropolitan cities in developed countries. *Source* UNHABITAT (2016), World Cities Report (2016)

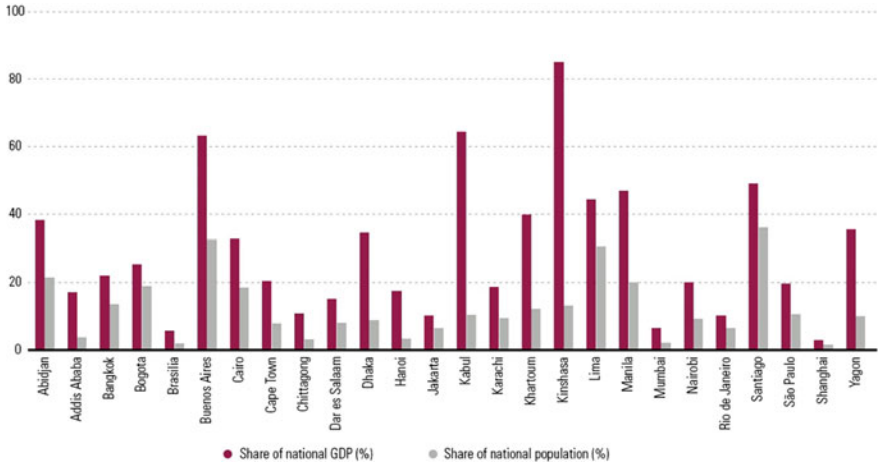

Fig. 1.14 Share of GDP and national population in selected cities in developing countries. *Source* UNHABITAT (2016), World Cities Report (2016)

1.8 The Metro/Mega/Meta City and Globalisation

Megacities, meta-cities and often metro cities are a key to globalisation, that brings about a state of interconnectedness around the globe that transcends and largely ignores national boundaries and slogans like America first, or Britain first. There is a division of labour across city regions transcending country boundaries sharing the

Table 1.7 Top 30 urban agglomerations by estimated GDP in 2025 (using UN population definitions and projections)

2025 GDP rank (2008 in brackets)	City		Estimated GDP in 2025 ($bn at 2008 PPPs)	Population in 2025 (millions)	Average real GDP growth (% pa: 2008–2025)
1(1)	Tokyo		1981	36.40	1.7
2(2)	New York		1915	20.63	1.8
3(3)	Los Angeles		1036	13.67	1.6
4(5)	London		821	8.62	2.2
5(4)	Chicago		817	9.93	2.1
6(10)	**Sao Paulo**	▲	**782**	**21.43**	**4.2**
7(8)	Mexico City		745	21.01	3.9
8(6)	Paris		741	10.04	1.6
9(25)	**Shanghai**	▲	**692**	**19.41**	**6.6**
10(13)	Buenos Aires		651	13.77	3.5
11(29)	**Mumbai (Bombay)**	▲	**594**	**26.39**	**6.3**
12(15)	Moscow		546	10.53	3.2
13(9)	Philadelphia		518	6.13	1.7
14(16)	Hong Kong		506	8.31	2.7
15(11)	Washington DC		504	4.89	1.8
16(7)	Osaka/Kobe		500	11.37	1.1
17(38)	**Beijing**	▲	**499**	**14.55**	**6.7**
18(12)	Boston		489	5.03	1.8
19(37)	**Delhi**	▲	**482**	**22.50**	**6.4**
20(14)	Dallas/Fort Worth		454	5.42	1.8
21(44)	**Guangzhou**	▲	**438**	**11.84**	**6.8**
22(21)	Seoul		431	9.74	2.3
23(17)	Atlanta		412	5.15	1.8
24(30)	**Rio de Janeiro**	▲	**407**	**13.41**	**4.2**
25(18)	San Francisco/ Oakland		406	3.90	1.8
26(19)	Houston		400	5.05	1.8
27 (20)	Miami		390	6.27	1.7
28(34)	**Istanbul**	▲	**367**	**12.10**	**4.2**
29(22)	Toronto		352	5.95	2.0
30(42)	**Cairo**	▲	**330**	**15.56**	**5.0**

▲ Rising by more than 3 places

Source PricewaterhouseCoopers projections

Table 1.8 Top 30 urban agglomerations by projected average real GDP growth 2008–25 (using UN population definitions and projections)

Growth rank	City	Country	Average real GDP growth in 2008–25 (% per annum)
1	Hanoi	Vietnam	7.0
2	Ho Chi Min City	Vietnam	7.0
3	Changchun	China	6.9
4	Guangzhou	China	6.8
5	Addis Ababa	Ethiopia	6.8
6	Xian	China	6.7
7	Surat	India	6.7
6	Beijing	China	6.7
9	Jaipur	India	6.7
10	Lucknow	India	6.6
11	Chengdu	China	6.6
12	Shenyang	China	6.6
13	Kanpur	India	6.6
14	Shanghai	China	6.6
15	Tianjin	China	6.6
16	Pune	India	6.6
17	Chongqing	China	6.6
18	Ahmedabad	India	6.5
19	Kabul	Afghanistan	6.5
20	Bangalore	India	6.5
21	Hyderabad	India	6.5
22	Dar es Salaam	Tanzania	6.5
21	Chennai (Madras)	India	6.5
24	Delhi	India	6.4
25	Lagos	Nigeria	6.4
26	Nairobi	Kenya	6.4
27	Kolkata (Calcutta)	India	6.4
28	Mumbai (Bombay)	India	6.3
29	Chittagong	Bangladesh	6.3
30	Kinshasha	Democratic Republic of Congo	6.3

Source PricewaterhouseCoopers projections using UN population definitions

global economic responsibilities as per capabilities. Global urban economies rely on advanced and standardises producer services such as finance, banking, insurance, logistics, law, management consultancy, advertising and other services. The technology revolution and uniformity of standard practices has made it possible for business enterprises to hire these services anywhere in the world. Intense use of ICT

in smart cities have an important role. Cities in the developing world have taken advantage of this to provide customer services at very competitive rates by drawing on a large labour force at low rates of pay. This trend, unfortunately, contributes to the creation of divided cities and the perpetuation of low income/slums. In recent time protectionism is emerging as a negative force against globalisation but only history can say how far protectionism became anti-globalisation and won the race, but it is more likely that Globalisation wins the race.
Examples of Cities that have become hubs of global economic activity are

1. Finance—Frankfurt, Hong Kong, Amsterdam, Singapore, Sao Paulo, Shanghai
2. Transport—Dubai, Rotterdam
3. Information technology—Bangaluru, Seattle, Silicon Valley.

Once the sole domain of Europe and North America, world cities are emerging in the developing world to compete with long-established capitals of commerce. Istanbul and Mumbai are culturally influential within their regions through film, literature, satellite TV networks and other forms of entertainment. Nairobi, Addis Ababa and Bangkok, amongst others, host regional headquarters for international agencies and development partners. Many of the metropolitan and megacities have become the seat of education and research bringing out innovations.

1.9 Emerging Global Functions of Large Cities

Large cities are interconnected and influence global and reinforce spatial interdependent functional structure with appropriate linkages. The connection is twofold within its city region and outside the city region transcending other national boundaries. The city is connected to hinterland and outside world simultaneously in a metropolitan region.

In 1950, there was 50% urban and 50% rural population in the world but thereafter urban population increased. Urban growth is often confronted with severe problems such as congestion, pollution, social segregation or high crime rates which threaten the achievement of a sustainable urban development. Consequently, many cities across the globe are engaging in an intense search for strategies which are suitable to address these issues. In several fields, such as public transportation, settlement and open space development as well as energy or water supply, solutions require a broader approach. Thus, both the city-region and metropolitan region are becoming increasingly important. The key role cities play in this context is two-fold: not only do they represent the centres in which economic and social change occurs, but also function as key ‘actors’ behind these changes. Globalisation and intense deployment of ICT in cities together result in the increasing importance of cities at the very top of the hierarchy, the so-called world cities or global cities.

1.10 Four Phenomena of Global Cities

1. Innovation capacity and the potential for economic development reside to a large part in metropolises and/or metropolitan regions. Research-intensive industries and knowledge-based services are becoming increasingly concentrated in metropolitan areas since there are reputed Universities and research institutions there. Innovation capacity and the potential for economic development reside to a large part in metropolises and/or metropolitan regions.
2. These areas not only enable innovative companies to exploit opportunities and to establish contacts but also allow them to access information and reduce risks. In addition, these areas also provide access to specialised resources and employees as well as to specific routines, traditions, values and other local institutions. Furthermore, urban agglomerations are characterised by a high degree of economic, social and cultural complexity functionally interconnected and embedded in the global division of labour, they, on the other hand, constitute the nodes of overlapping financial flows as well as trade, production, political, cultural and social networks.
3. The national hierarchy of cities and the spatial division of labour within the economy is superimposed by a global division of labour. Cities and metropolitan regions become part of an emerging international hierarchy based on a competitive division of labour at the global level by international connections that affect financial flows and the knowledge-intensive service sector. It leads to the emergence of a vertical hierarchy of globalised city-regions, the relationship between spatial decentralisation and territorial concentration alters the position of peripheral areas in this emerging spatial structure and new ones are created, unbalanced spatial development is reinforced and regions characterised by expansion, stagnation and negative growth co-exist. Highly-skilled employment, high-value infrastructure and investment increasingly concentrate in large metropolitan regions.
4. At the same time, these regions align their specialisation with the global division of labour and forge links with other dynamic metropolitan regions. In contrast, interconnections between metropolitan regions, their hinterlands and immediately surrounding (structurally weak) areas may well decrease. Thus, these areas are becoming increasingly disconnected from economic development. In view of the developments described above, the lack of suitable institutional structures that extend beyond the city-level becomes evident.

Alongside their effect on the role of metropolitan areas as the hubs of economic development, changing spatial patterns are also impacting the level of institutional action within the state hierarchy. State powers are not only being devolved to trans-national levels, but also to newly constituted tiers of metropolitan-regional governance. Considering the growing importance of regions, the need for adequate organisational structures (‘for metropolitan governance’) in metropolitan regions is greater than ever before.

1.11 World Cities and Global Cities

The term "world city" was coined by Patrick Geddes in his 1915 book, Cities in Evolution [35]. Geddes was "an unclassifiable polymath who officially taught biology (more probably, anything but biology) at the University of Dundee, gave India's rulers idiosyncratic advice on how to run their cities and tried to encapsulate the meaning of life on folded scraps of paper." Geddes's comments on world cities were mostly forgotten, however, in part because Geddes became so famous for his work on regional planning. Half a century later, however, Peter Hall catalysed a new generation of interest in the topic.

World cities are characterised by a sum of political power (both national and international) and organisations related to government; national and international trade, whereby cities function as gateway for their own and sometimes also neighbouring countries; providing superior banking, insurance and related financial services; advanced professional activities of all kinds; information gathering and diffusion. The form and extent of a city's integration with the world economy and the functions assigned to the city in the new spatial division of labour will be decisive for any structural changes occurring within it. Key cities throughout the world are used by global capital as 'basing points' in the spatial organisation and articulation of production and markets. The resulting linkages make it possible to arrange world cities into a complex spatial hierarchy. The global control functions of world cities are directly reflected in the structure and dynamics of their production sectors and employment. They are major sites for the concentration and accumulation of international capital. They are points of destination for large numbers of both domestic and/or international migrants. World city formation brings into focus the major contradictions of industrial capitalism, among them spatial and class polarisation. World city growth generates social costs at rates that tend to exceed the fiscal capacity of the state. Conspicuous consumption; arts, culture and entertainment and the ancillary activities that cater for them. Three main functions of world cities are headquarters function, financial centres function, and articulator' cities that link a national or regional economy to the global economy [28–30].

World Cities hypothesis of Freidman [36] is enumerated below.

1. The nature of a city's integration with the world economy is decisive for any structural changes occurring within it.
2. Key cities throughout the world are used by global capital as 'basing points' for the organisation of production and markets.
3. The global control functions of world cities are manifest in the structure of their industrial structure and job markets.
4. World cities are major sites for the concentration and accumulation of capital.
5. World cities are destinations for large numbers of migrants—both domestic and international.

6. World city formation exposes the major contradictions of industrial capitalism, particularly spatial class polarisation.
7. World city growth generates social costs that exceed the fiscal capacity of the state.

New technologies, telecommunications and information technology have led to both a decentralisation and agglomeration of economic activities. This combination of spatial dispersal and global integration 'has created a new strategic role for major cities', thus leading to a new type of city (essentially different from historical banking and trade centres). Global cities, for Sassan, form a 'virtual economic cycle' and function in four new ways: the demand for control creates cities as 'command points'; this leads to a demand for finance and business services, whereby cities become the 'key locations' for leading economic sectors; cities become sites of production and innovation for these leading economic sectors; cities constitute markets for main economic sector production [37].

1.12 Survey of Design of Economic and Spatial Strategies of Official Metropolitan Plans

There are two trends of thoughts about Meta cities, Megacities, and metro cities. One tries to attain a position of the global city by deliberately executing spatial and economic strategies to achieve that goal following what is discussed in the earlier paragraphs. This is in addition to solving many issues of metropolitan development for local people. The second approach is how to make a metropolitan area a smart metropolis by appropriate spatial and economic strategies. Smart is ICT and IOT implementation in all activities including economic activities. Economic strategies may involve converting the region with all its economic activities to the smart economy as discussed in "Smart Economy in Smart Cities" [18]. Since this book concentrates in a narrow area of design of economic and spatial strategies a survey, of such designs of several official plans is undertaken here. Cities are selected randomly with no sampling plans. It is also presented randomly with no regional clustering. This study is based on a classroom exercise conducted for Master's degree students of Planning in the National Institute of Technology Calicut by the author and the students involved are named in the acknowledgement before the References section. This survey will be conducted focussing on strategies will be briefly stated without any description of these metropolises and finally, these designs are analysed critically.

1.12.1 Case Study 1—Delhi NCR Metropolitan Region [38, 39]

The Delhi National Capital Region(NCR) comprises of regions from four different regions/states; National Capital Territory of Delhi, Haryana Sub-region comprising of Faridabad, Gurgaon, Rohtak, Sonepat, Rewari, Jhajjar, Mewat and Panipat

districts, Rajasthan Sub-region comprising of Alwar district and Uttar Pradesh Sub-region comprising Meerut, Ghaziabad, Gautam Buddha Nagar, Bulandshahr and Baghpat. The central region is bustling with population leading to over-crowding and congestion due to its inherent capacity to generate more income and employment. The city limits are moving farther away from the city centre due to urban sprawl that creates spatial issues.

The main spatial strategy adopted was polycentrism by developing different nodes and the linkages via road and rail to arrest urban sprawl. This helps decentralise the core activities. NCR planning board has implemented zoning regulations to curb excessive urban sprawl and to preserve environmentally sensitive areas. Provision of ring roads to improve accessibility worsens the existing problem instead of the radial road system (Table 1.9).

The National Capital Region is rapidly emerging as a global economic hub and is among the fastest growing economic regions in India with a CAGR of GDP at 8.76% (2000–2008) to CAGR of GDP of India being 7.8% during the same period. There is a marked change in the economic structure of different Sub-regions. NCT of Delhi has become the main centre for tertiary sector activities. Uttar Pradesh and Rajasthan Sub-regions are still dominated by agriculture-led activities, while Haryana Sub-region is a mix of industrial and service sectors. Gurgaon district in Haryana sub-region has shown phenomenal growth in terms of per capita income, primarily due to the fast growth of IT and ITES sector, while Panipat district in Haryana Sub-region is evolving as a major trade centre. Alwar district in Rajasthan sub-region, on the other hand, remains an agriculture economy (Table 1.10).

The economic strategy adopted by the NCR planning board is not efficient enough for a city such as Delhi. Making trade and commerce barrier free which is the aim of Goods and Service Act 2017 nationwide within NCR will not suffice.

Table 1.9 Spatial concept and strategies of Delhi NCR

Objective	Strategy	Implementation
Polycentric model	Decentralisation	Infrastructure development is proposed at different nuclei to concentrate development at strategic locations
Socio-economic development	To provide access to education and health facilities, agricultural extension services and agro-industries based on local products	New townships are proposed along key transport corridors, expressways, orbital rail corridors
To contain urban sprawl	Controlled/development/ regulated zone	Urbanisable area, agricultural (rural) zone within controlled/development/ regulated area and green buffers
To preserve eco-sensitive areas	Zoning	Natural conservation zone, agriculture (rural) zone outside controlled/development/regulated areas

Table 1.10 Economic concept and strategies-Delhi NCR

Objective	Strategy	Implementation
To strengthen economic base functions	Counter magnet towns for decentralised economic development	To develop inter-regional linkages such as expressways, transport corridors
To remove barriers to trade with uniform tax	Single economic zone	To implement a uniform tax base and transparent system
To increase the ease of carrying out business	Single window facility	To set up single window system of registration, financing and industrial regulatory measures
To integrate and promote informal sector participation	Specialised streets/spaces	To provide parking and other open spaces To be located strategically near work centres, commercial areas, near schools, colleges, hospitals, transport nodes

Other specific issues mainly administrative issues are not addressed for further easing to do business and giving impetus for the development of industries. Interstate agreement on unified policies can create chaos and may reach a long time to reach consensus. This might be a hindrance to further development of NCR region. Increased ease of doing business, transparent laws and regulations for the same have not been given due consideration. Also, focus on people and skill development for economic development is not visible.

1.12.2 Case Study 2—Vancouver Metropolitan Region [40, 41]

The Metro Vancouver region includes twenty-one municipalities, one Treaty First Nation and one unincorporated area, each with its own unique physical, demographic and local economic characteristics. The region has great strengths on which to focus a prosperity initiative. It is recognised globally for its overall livability and has done especially well in international surveys of metropolitan areas on attributes such as tolerance, the presence of amenities and quality of place.

Metro Vancouver is a consortium of 21 municipalities which requires a very high level of agreement among the consortium municipalities on policy and actions. Regional Growth Strategy's ability to coordinate land use is governed by municipalities, and major transportation facilities are governed by the province. The future may require stronger Metro Vancouver political leadership through a part of the Board being directly elected rather than appointed by to provide equitable and efficient decision making and services (Table 1.11).

Table 1.11 Goals and spatial strategies Vancouver

Goals	Strategies
To create a compact urban area	– Contain urban development within the urban containment boundary – Focus growth in urban centres and frequent transit development areas – Protect rural areas from urban development
To support a sustainable economy	– Promote land development patterns that support a diverse regional economy and employment close to where people live – Protect the supply of industrial land – Protect the supply of agricultural land and promote agricultural viability with an emphasis on food production
To protect the environment and respond to climate change impacts	– Protect Conservation and Recreation lands – Protect and enhance natural features and their connectivity – Encourage land use and transportation infrastructure that reduce energy consumption and greenhouse gas emissions, and improve air quality – Encourage land use and transportation infrastructure that improve the ability to withstand climate change impacts and natural hazard risks
To develop complete communities	– Provide diverse and affordable housing choices – Develop healthy and complete communities with access to a range of services and amenities
To support sustainable transportation choices	– Coordinate land use and transportation to encourage transit, multiple-occupancy vehicles, cycling and walking – Coordinate land use and transportation to support the safe and efficient movement of vehicles for passengers, goods and services

Transit Oriented Development (TOD) and urban compaction have been deployed so that major employment and trip generating activities are concentrated in the centre to reduce the trip length and hence pollution. Mixed employment areas are provided while planning land use which is a preferred and unconventional approach. A mix of housing types suitable to an ageing population, changing family and household characteristics are provided which indicates inclusive development for all sects of the society. In city planning in Vancouver non-motorised mode and the barrier-free environment is given top most priority. Their strategies and actions also recognise the importance of providing connectivity throughout the region linking important natural features and enhance natural assets. The strategies adopted are smart, eco-friendly and sustainable and people inclusive in the long run.

Vancouver has a diversified economy dominated by the service sector which allows for greater responsiveness and resiliency in the face of changing economic trend. It supports the emergence of industry clusters important to competitive metropolitan economies. Metro Vancouver, situated on Canada's West Coast and at

the mouth of the Fraser River, became a major centre for trade. With the economic importance of the Asian Pacific economies, this role as a gateway will continue to grow. Business and labour migrate freely across municipal boundaries to perform activities. The number of businesses and jobs related to cargo handling, storage, distribution and transportation have grown along with the port. Tourists and conventions are attracted to the natural beauty as well as to the recreational and cultural opportunities within the region.
The main issues noted here are (Table 1.12):

– Deteriorating affordability
– Competition for land
– Investment in transportation and transit infrastructure
– Climate change.

In the case of Vancouver, there is a strong economic strategy in place. Local businesses and talents are nurtured which results in a booming diverse economy. Brain–drain is prevented by attracting foreign Canadians and immigrants with attractive and affordable housing and environment for families. This is a strategy to attract a skilled workforce. Integration of universities with business centres for productive R&D yet another important step in economic growth. They have thoroughly invested in clustered growth of industries with increased focus on green jobs to remain sustainable in the long run.

1.12.3 Case Study 3—Melbourne 2030—Planning for Sustainable Growth [42–44]

Melbourne 2030 Plan was based on inclusiveness, equity, leadership and partnership. The Goals laid out in the plan were a more compact city, better management of metropolitan growth, network with the regional cities, a more prosperous city, a great place to be, a fairer city, a greener city, better transport links, better planning decisions, and careful management.
A more compact city:

- Build up activity centres as a focus for high-quality development, activity and living for the whole community.
- Locate a substantial proportion of new housing in or close to activity centres and other strategic redevelopment sites that offer good access to services and transport.

Better management of metropolitan growth:

- Establish an urban growth boundary to set clear limits to metropolitan Melbourne's outward development.
- Concentrate urban expansion into growth areas that are served by high-capacity public transport.

Table 1.12 Economic concept and strategies-Vancouver

Focus areas	Goals	Strategy
Climate for growth	Promote innovation	– Innovation zones – Early adoption of technologies – Smart government practices – Pre-procurement strategies
	Protect and enhance job spaces	– Plan for job spaces of the future – Support speciality spaces for key sectors – Work/live neighbourhoods
	Leverage and support partnerships	– Building strategic global partnerships – Engage more effectively with all governments – Strengthen local partners and their work
	Communications	– Global communications campaign – Local outreach business and levering social media – Work with partners to deliver a stronger business message
Focus on people	Protect and enhance livability and affordability	– Engage businesses in affordability planning – More affordable day care – Address other livability/affordability barriers
	Attract, retain, retrain and repatriate talent	– Protect quality of living for talent – Retraining and skill development programs – Target Canadians abroad – Support employers with recruitment – Help strengthen enabling legislation
Supporting investment and trade	Levering event and programs	– Lever major events – Address gaps and establish Vancouver tech centre – Identify competitive advantages for cluster growth
	Global trade	– Launch global trade program – Support for mature and emerging sectors – Target new trade regions especially Asia
	Emerging sectors	– Execute greenest city jobs and economy – Launch creative city strategic planning – Support science and ICT clusters
	Business works	– Launch Business works targeting 450 companies a year – Business matching, incubation and coaching – Facilitate access to capital and markets – Build a database and research program

Networks with the regional cities:

- Promote the growth of regional cities and key towns on regional transport corridors as part of a networked cities model.
- Control development in rural areas to protect agriculture and avoid inappropriate rural residential development.

A more prosperous city:

- Maintain access to productive natural resources and an adequate supply of well-located land for energy generation, infrastructure and industry.
- Strengthen Central Melbourne's capital city functions and its role as the primary business, retail, sport and entertainment hub for the metropolitan area.
- Further, develop the key transport gateways and freight links and maintain Victoria's position as the nation's premier logistics centre.
- Create opportunities for innovation and the knowledge economy within existing and emerging industries, research and education.
- Encourage the continued deployment of broadband telecommunications services that are easily accessible.

A great place to be:

- Promote good urban design to make the environment more liveable and attractive. Improve community safety and encourage neighbourhood design that makes people feel safe.
- Protect heritage places and values: Promote excellent neighbourhood design to create attractive, walkable and diverse communities.
- Improve the equality and distribution of local open space and ensure long-term protection of public open space: Rectify gaps in the network of metropolitan open space by creating new parks and ensure major open space corridors are protected and enhanced.
- Maintain and develop metropolitan Melbourne as a desirable tourist destination.

A fairer city:

- Increase the supply of well-located affordable housing, plan for a more equitable distribution of social infrastructure, develop a strong cultural environment and increase access to arts, recreation and other cultural facilities.

A greener city:

- Protect habitat and areas of important biodiversity through appropriate land-use planning.
- Promote the concept of sustainability and develop benchmarks to measure progress.

Better transport links:

- Upgrade and develop the Principal Public Transport Network and local public transport services to connect activity centres and link Melbourne to the regional cities.
- Review transport practices, including design, construction and management, to reduce environmental impacts.
- Give more priority to cycling and walking in planning urban development and in managing our road system and neighbourhoods Promote the use of sustainable personal transport options.

Better planning decisions, and careful management:

- Achieve better planning decisions,
- Speed up resolution of appeals,
- Keep Melbourne 2030 up to date,
- Develop a strong partnership with local government, Implement Melbourne 2030 in an integrated way that involves the community.

Delivering a new integrated economic triangle consisting of Good Governance and strong partnerships, strengthening the competitiveness of Melbourne's employment and reduce the cost of living by increasing housing supply near services and public transport. Facilitate supply of affordable housing, expand the central city to retain competitive advantages and attract diverse value-added businesses. Prepare a plan for the central subregions to accommodate at least one million jobs and people. Facilitate the development of national employment clusters, support development of metropolitan activity centres, identify new development and investment opportunities.

Plan Melbourne does not identify how the government will respond to the impacts of climate change. The Metropolitan Planning Authority must work in close partnership with Local Government, in the future planning for Urban Renewal Areas. Initiatives to 'streamline' the planning system which limits community involvement in the planning process, or reduces Local Government's decision-making responsibilities, are not supported.

1.12.4 Case Study 4—Shanghai Metropolitan Plan 2001–2020 [45–51]

Shanghai is one of the four direct-controlled municipalities of the People's Republic of China. It is one of the most populous and dense cities in the world, with a population of more than 24 million as of 2014. It is a global financial centre and transport hub, with the world's busiest container port. The municipality borders the provinces of Jiangsu and Zhejiang to the north, south and west, and is bounded on the east by the East China Sea.

The issues encountered are a lack of carrying capacity of the land, the difficulty of land use structure, the difficulty of the renovation and expansion of municipal

facilities, high-density city, environmental pollution, and energy saving pressure, rising sea level and other potential natural disasters.

Shanghai Metropolitan Master Plan (1999–2020) postulates "One dragon head, four centres"—dragon head of Yangtze River Region; international economic centre, financial centre, trade centre, and logistics centre in 2020 with Central Shanghai: financial and insurance; IT high tech, residents in 2020—16 million, and urbanisation rate of 85%. Infrastructure postulates "three harbours & two ways" (seaport, airport, cyber harbour; high-speed railway, expressway); "two networks" (rail transit network; expressway network) and green space in 2020—10 m^2 per capita.

Shanghai is China's most powerful economic centre, to drive the growth of the nation; with a leading portal for international business, to facilitate global cooperation and exchange; Global high-tech manufacturing industry centre; and a world-class metropolitan region.

"One Core, Six Development Zones": City development is based on "multi-axis, multi-layer, multi-core", space layout of central city "multi-nuclear, open" City evolved to Multi-centre network urban system trying to make Shanghai a Compact city.

The ecological strategy involves constructing an ecological network covering Shanghai region and connecting the Yangtze River Delta.

The main economic activities in core districts include commerce, tourism, professional services, and some traditional old industries. The main economic activities in the outlying districts are very diversified, ranging from manufacturing industries to commerce, agriculture, tourism, storage and transportation. Shanghai is now facing great opportunities in turning itself into an international economic, financial, and trade centre. China's continuous economic growth provides a solid base for Shanghai to move toward this goal. Shanghai has set its long-term strategic objectives for social and economic development. By 2010, Shanghai is planned to become one of the international economic, financial and trade centres of the world. Initially, to form the economic scale and comprehensive strength of a world metropolis; optimise urban spatial distribution, initially, modernise the city's physical infrastructure, participate in international labour division and the circular flow of the international economy, introduce the operational mechanism of a socialist market economy, and pursue the balanced social, economic and environmental development. The main goals were to build the economic scale and comprehensive strength of a world metropolis by optimise urban space distribution, modernise the city's infrastructure, participate in the international labour division and the circular flow of international economy, introduce the operational mechanism of a socialist market economy, and pursue balanced social, economic and environmental development. Economic Strategies plan is to optimise and upgrade the industrial structure, trying to improve the pivotal status of Shanghai in global city network and process to accelerate the technological innovation.

1.12.5 Case Study 5—Mumbai Metropolitan Regional Development [52]

Mumbai Metropolitan region consists an area of 4311.75 km^2 which includes two full districts of Mumbai City, Mumbai Suburban and three-part districts of Thane, Raigad and the newly created Palghar district. The boundary of the area includes river Tansa in North, administrative boundaries of Bhiwandi, Kalyan and Ambernath Tehsils in North-East, Sahyadri in South-East, river Patalganga in South and the Arabian Sea on West. Maharashtra is currently the third urbanised state in India. The urban population of Maharashtra constitutes 45.23% of the total population of the State and Urban population growth accounted for 62% of the total population growth in the State. Nearly 45% of this urban population lives in MMR (Mumbai Metropolitan Region). MMR includes 8 municipal corporations, 9 municipal councils, 35 census towns and 994 villages.

Rural-urban imbalance: There is an imbalance between the development of the urban and rural areas in the region in terms of access to social and physical infrastructure and livelihood opportunities. The urban areas of the region have better access to infrastructure while several pockets of inadequacy exist in the rural areas of the region, especially in the largely tribal northeastern belt.

Slum Proliferation: Lack of access to affordable formal housing and lack of access to housing finance because being employed in the informal sector are the two major reasons for the growth of slums.

Transport: The suburban rail transit network is the backbone of the region's economy. This suburban rail network is currently stretched beyond its maximum capacity. Peak hour commuters are subject to inhuman levels of crowding with each car carrying more than double the stated carrying capacity of 1800 passengers. Limited land availability is a major constraint to augmenting services which are currently run at maximum efficiencies. Not all existing rail lines are computerised. If services on such lines are augmented or if the suburban networks are extended, it would be beneficial.

Environment: Environmental pollution due to increasing urbanisation is resulting in poor quality of life and directly impacting the livelihoods of those engaged in fishing and agriculture in the region. Increased air and water pollution are observed across the region due to increased vehicular emissions, industrial pollutants, construction activity, quarrying, untreated or poorly treated effluent discharge from domestic as well as industrial sources as well as inadequate solid waste disposal capacities and measures.

Infrastructure: Dense living conditions in several metropolitan areas in the region, viz. Greater Mumbai, Bhiwandi, and Ulhasnagar have resulted in the inadequate provision of social infrastructure. Peri-urban areas have poor social and physical infrastructure given the lack of governance frameworks available in these areas. MMRDA was unable to provide infrastructure services where the land resource is not available to them to raise finances. A significant proportion of the urban areas

Table 1.13 Spatial concepts and strategies-Mumbai

Concept	Strategy
Increase public transit connectivity in the region	• Extend suburban rail connectivity to peripheries of MMR • Increase suburban stations • Create new transit corridors • Develop multi-modal corridor • Use transit to spur development in current under-developed areas
Framework for addressing the housing problem	• Policy to enable the market to meet the need • Creating land-banks for intervention by the govt. • Regulatory and institutional arrangement for housing in MMR
Create regional scale open space networks	• Create a blue-green regional network that links heritage sites and tourist sites • Create a greenway along the multi-modal corridor • Preserve all surface water bodies in the region • Maintain a buffer around all major rivers, water bodies and forests and create a network of open spaces throughout the region
Extend governance framework to peri-urban areas	• Extend current municipal boundaries to include peri-urban areas that are rapidly urbanising • Create decentralised sub-regional offices of MMRDA to realise local strategies
Creation of regional infrastructure	• Provide regional scale infrastructure like regional parks, sports complexes, large hospitals, educational institutions, fire services, landfills etc.
Zoning	• Simplified zoning
Regional information system	• Create a Regional Information System (RIS)

along with the rural areas in the region is underprovided in terms of sanitation systems and in terms of effective solid waste management systems (Table 1.13).

The Spatial strategies formulated tried best to cover every important aspect. The focus is given to transportation and housing.

The secondary sector in the region has been declining since the 1990s-following globalisation and liberalisation. This period has witnessed the flight of manufacturing from the region, starting with the closure of the textile mills in Greater Mumbai and the increasing non-availability of skilled jobs. The lack of jobs that match the skilled manpower available within the region has led to increasing formalisation of work. The CAGR of the contribution to the NGDP of MMR of the secondary sector between the periods 2000–2009 had decreased to 4.56 as against 6.27 during 1999–2003. Policies encouraging the conversion of industrial lands to residential use also aided this decline of the secondary sector and enabled the growth of the real estate market at the expense of manufacturing.

A concentration of employment opportunities in Greater Mumbai has resulted in imbalanced growth in the region. Currently, sixty percent of all the formal jobs in the region is in Greater Mumbai, though there is an increasing movement northward to

the suburbs from the Island city. Since the Regional Plan 1996, new CBDs have emerged in Greater Mumbai at Bandra-Kurla, Lower Parel, Andheri and Powai, which is now indicating a polycentric growth pattern within Greater Mumbai. However, apart from Navi Mumbai and Bhiwandi, there are not many employment opportunities in the cities outside Greater Mumbai, resulting in long commutes from the cities outside Greater Mumbai that largely serve as dormitory cities (Table 1.14).

The Economic strategy given by the metropolitan plan is very broad. Mumbai Metropolitan Regional Plan 2016-36 mainly addressed issues of growing urbanisation, uneven distribution of jobs increasing commutes, lack of affordable housing and basic infrastructure in the region, environmental degradation and inadequate governance. The existing situation of Mumbai Metropolitan Region is analysed sectoral and cross-sectoral to arrive at issues that need to be addressed in the Regional Plan 2016-36.

1.12.6 Case Study 6—New York [53–55]

The New York metropolitan area, also referred to as the Tri-State Area, includes New York City; Long Island and the Mid- and Lower Hudson Valley in the state of New York. Lower Hudson Valley, consisting of Putnam, Rockland, and Westchester counties. New York City, consisting of Bronx, Queens, New York (Manhattan), Kings (Brooklyn), and Richmond (Staten Island) counties and Long Island, consisting of Nassau and Suffolk counties. The tristate region compares to other metropolitan areas with respect to economic disparities, segregation, access to quality primary schools, intergenerational mobility and quality of life indicators. The New York area fares worse than most comparable regions in terms of inequality and segregation. Intergenerational mobility in the region is high in

Table 1.14 Economic concepts and strategies-Mumbai

Concept	Strategy
Enable balanced regional development	• Create new growth centres/employment hubs dispersed across the region • Create Local Development Centres (LDCs) as rural hubs • Promote tourism and • Encourage primary sector livelihood opportunities
Encourage manufacturing in MMR	• Demarcate new industrial zone in the region • Provide logistic parks near the port • Encourage SMEs across the region
Increase public transit connectivity in the region	• Extend suburban rail connectivity to peripheries of MMR • Increase suburban stations • Create new transit corridors • Develop multi-modal corridor • Use transit to spur development in current under-developed areas

comparison to other parts of the country. The region is faced with a daunting set of challenges, yet has the potential to leverage strengths in promoting policies that afford equal opportunities to live full, healthy and productive lives regardless of starting point for all residents (Table 1.15).

The plan mainly focuses on the concept of Quality of Life. It tried to find a solution to the prevailing economic disparity and social segregation in New York. It gave less important to utility plan, but they have a separate transportation plan for New York Metropolitan area.

The tristate region has one of the largest, most dynamic and complex economies in the world. It produces nearly $1.5 trillion goods and services every year. Increasingly, this economy is driven by the region's ability to attract, educate and retain a workforce with diverse skills and creative talent.

Table 1.15 Spatial concepts and strategies-New York

Concept	Strategy
Revitalise urban and suburban downtowns	• Support transportation, water and sewer infrastructure investments that facilitate equitable and sustainable redevelopment • Promote tools such as generic environmental impact statements or tax increment financing that facilitate development
Increase supply of affordable housing	• Reform zoning and related regulations to permit higher densities, more multi-family development and accessory apartments • Revise permitting, approvals, labour regulations and other actions to reduce construction costs • Expand the use of inclusionary zoning to leverage market rate development for low- and moderate-income housing
Promote mixed-income, multi-racial neighbourhoods	• Create effective state fair share regulations to require and incentivize affordable housing in areas with high opportunity • Strengthen housing preservation in low-income and gentrifying neighbourhoods • Create regional institutions to develop metropolitan housing plan; set municipal targets and distribute housing vouchers
Create healthier and more resilient communities	• Promote policies and design guidelines, such as complete streets legislation, that improve safety, physical activity and public amenities • Advocate for reform of federal financing guidelines to promote mixed-use, walkable neighbourhoods • Improve access to quality parks and a network of regional greenways • Build in resiliency standards and guidelines to new development and building retrofits
Improve access to jobs and entrepreneurship	• Extend rail and bus service and improve service to underserved neighbourhoods • Expand and subsidise demand-response transportation service for “last mile” service or low-density areas • Implement reduced fares for low-income transit users • Build municipal and regional broadband services to expand coverage and lower cost
Reform property taxes and education finance	• Consolidate school districts to reduce costs and expand access to quality schools • Implement regional tax-sharing, building on models such as in the NJ Meadowlands • Replace local school taxes with statewide education taxes

(continued)

Table 1.15 (continued)

Concept	Strategy
Transportation strategy	
Enhance the regional environment	• Reduced traffic congestion and improved air quality; • Reduced greenhouse gas emissions; • Improved water quality; and • Preservation of open space, especially wetlands
Improve the regional quality of life	• Increased intra-regional mobility and accessibility for commuting, recreation and tourism • Increased ability to safely enjoy walking, bicycling and use of public space • Complete planning and/or environmental assessments for the following transit-oriented development • Transportation improvement vision projects linked to land use plans
Provide a convenient and flexible transportation system within the region	• A sufficient array of transportation choices; • Expanded connections, particularly across modes and between communities; • Increased reliability for passenger and freight trips; and • Implement congestion-related improvements and enhancements
Enhance the safety and security of the transportation system for both motorised and non-motorized users	• Reduced rate of annual injuries and fatalities on the region's transportation systems; • Promulgation of advanced safety and security measures throughout the region

Economic concepts and strategies

The Western New York has adopted an integrated approach in building economic strategies primarily to strengthen fundamentals the to build the target industries.

Strengthen Fundamentals
The strategy focuses on three fundamental issues shown here, that if addressed appropriately can create the right environment for job growth and wealth creation. With a stronger workforce, more efficient infrastructure, and a vibrant culture of entrepreneurship, New York can turn the economy around.

Build Target Industry Sectors
The strategy also puts forward ways to capitalise on opportunities in eight industry sectors. These are industries where New York already enjoy high concentrations of employment, potential growth in jobs and wages is greatest, and possess unique asset or advantage.

The economic strategy adopted clearly touches every aspect of the economy. The plan also emphasised on strengthening the fundamentals such as workforce which is very important in achieving economic development.

The New York Metropolitan Region have a separate spatial plan, transportation plan and economic development plan. The strategies adopted clearly ensure sustainable and long-term growth in jobs and income to contribute to the resurgence of the broader economy of New York State. Also, they have a detailed transportation development plan which has a shared vision for sustainability.

1.12.7 Case Study 7—Calgary Metropolitan Region [56]

The Calgary Region is an area centred on Calgary, Alberta, Canada. It consists of the City of Calgary, Rocky View County and the municipalities it encloses. The

Calgary Region is a major transportation hub for southern Alberta, Saskatchewan, eastern British Columbia, and parts of the northern United States. It is home to the Calgary International Airport, the third busiest airport in the country in terms of total aircraft movements. it the largest CMA in Alberta and the fifth largest in Canada. it had a population density of 237.9 people per square kilometre in 2011.

This region has plenty of natural landscapes, ecologies and water sources which are unidentified. There is a lot of potentials to develop and make the total region as harmonious. In the present situation, people are widely spread which implies less density and no continuous development throughout the region. Most of the land is not efficiently used. There is scope to develop scenic corridors. Presently percentage of mixed land uses is less.

Strategically adopted accommodating growth in more compact settlement patterns with higher density infill development across the region makes good sense for the environment, the economy, and for the quality of life. This type of managed growth and development has many benefits, including preserving agricultural land, reducing infrastructure expenses, promoting public transit and encouraging the effective use of green spaces. Development within priority growth areas should be built out in a contiguous and connected manner. New housing in priority growth areas will be near local and regional transit service. Unplanned lands (greenfield areas) in existing priority growth areas and lands identified for new priority growth areas will be designated and approved in local plans to achieve a minimum density of eight to 10 units per gross residential acre, and encourage higher densities where achievable. Member municipalities will strive to accommodate at least 25% of new population growth across the region through intensification of existing developed areas. Building sustainable and resilient communities require planners to consider all aspects of community life, including social, environmental and economic factors. The Calgary Metropolitan Plan helps by providing a framework for member municipalities to use as they decide how to create their own unique, sustainable communities. Member municipalities will identify and protect important historic and cultural resources that contribute to the unique character of existing communities. All new and existing priority growth areas will develop and maintain one or more viable mixed-use activity centres, integrated with local and regional transit stations, terminals and services, to promote local employment opportunities and transit accessibility. A minimum intensity threshold of 100 people or jobs/gross developable hectare, within walking distance of regional transit services, should be achieved in new mixed-use activity centres.

The Plan mention the intensification of density but did not mention what are the ways to increase density, in which all places need to be densified and what are the density values. Not much focus is on industry development activities which further leads to improvement of job opportunities which creates a quality of life. The Plan stated about infrastructure improvement but what's the present status and what is the desired level not clearly mentioned. Spatial representation is less clear.

In existing situation, there is need of retaining the regional workforce. Jobs distribution is uneven and there is need of making job distribution as uniform throughout the region. Finding of appropriate land for industrial development is essential.

The Calgary Regional Partnership (CRP) and member municipalities will work together to ensure a diversified and globally competitive region that continues to enjoy a high quality of life and is able to attract and retain a viable and adequate regional workforce and member municipalities will endeavour to achieve a distribution of jobs creation and economic activities throughout the region consistent with transit and complete mobility policies that encourage the location of jobs close to where people live. Member municipalities will strategically identify lands and corridors for future economic activities and work together with stakeholders to ensure identified lands successfully support economic activities. Member municipalities should encourage industrial and commercial sectors to establish in areas across the region that have been identified as compatible and strategic locations for specific types of activity and investment. And member municipalities will endeavour to maintain and enhance the region's strategic transportation networks (roadways, railways, airports, transportation hubs) to link regional industries to markets—locally, regionally, nationally and globally and to attract new industries to the region.

Recognising the connections and relationships that exist between communities, the Calgary Metropolitan Plan (CMP) acknowledges and respects the vital and historic importance of rural lands, industry and culture in our region. Calgary Regional Partnership (CRP) member municipalities will continue to support rural economic opportunities in the region. CRP and member municipalities will work proactively with the Province and the private sector to effectively manage resource development activities that impact the region's economy, natural environment and settlement pattern. The CRP and member municipalities will collaborate to provide regional servicing to identified commercial/industrial rural-regional priority growth areas for CRP members.

By coordinating efforts, instead of duplicating them, directly reduce the pressure on residential taxes to support constantly growing local needs. Through effective land use strategies, enhanced infrastructure provision and improved regional transit mobility options, the Calgary Metropolitan Plan (CMP) helps increase the economic competitiveness of the region and its municipalities. The Calgary Metropolitan Plan gives municipalities an opportunity to participate in region-wide solutions to common municipal issues while respecting local autonomy. The implementation of solutions is in the hands of the individual councils.

What are the industries and where those can be established to boost the economy and employment is not stated? What are the land management techniques suitable in this region are not mentioned? There is a lot of potentials to develop tourism which is not at all described. They mentioned that various studies need to be done to analyse the economic boost but what are those not stated. The Calgary Metropolitan Plan is the blueprint for accommodating growth in future. The plan giving the various strategies to make Calgary as a healthy environment in enriched communities, with sustainable infrastructure and a prosperous economy.

1.12.8 Case Study 8—Kuala Lumpur Metropolitan Regional Development Plan [57]

Kuala Lumpur is the largest city in Malaysia. Being rated as an Alpha world city, Kuala Lumpur is the only global city in Malaysia which covers an area of 243 km^2 (94 sq mi) and has an estimated population of 1.73 million as of 2016. Greater Kuala Lumpur, also known as the Klang Valley, is an urban agglomeration of 7.25 million people as of 2017. It is among the fastest growing metropolitan regions in South-East Asia, in terms of population and economy. Kuala Lumpur is one of three Federal Territories of Malaysia, enclaved within the state of Selangor, on the central west coast of Peninsular Malaysia. Kuala Lumpur has undergone rapid development in recent decades.

Kuala Lumpur and its surrounding urban areas form the most industrialised and economically, the fastest growing region in Malaysia. The city remains as the economic and business centre of the country. Kuala Lumpur is a centre for finance, insurance, real estate, media and the arts of Malaysia.

Residential land use increased from 3822 to 5490 ha between 1984 and 2000 and is the largest land use component in the City. However, residential land use in the City Centre has declined significantly between 1984 and 2000 and now accounts only for 26.4% of the total residential land use in 1984 and slow growth of residential land use in Bukit Jalil. Regarding commercial land use, the issues are a preponderance of commercial land use in the City Centre and Commercial growth outside the designated growth areas. Regarding industrial land use, the issue is many of the older industrial areas are in a dilapidated state. The problem for institutional land use is the future use of buildings and lands formerly occupied by federal government offices. However, open space, recreational and sports facilities only represent 6.5% of total land use, and the amount that is available as public open space is even less when private open spaces such as golf courses are excluded. There is a shortage of suitable sites for community facilities and under utilisation of utility reserves.

The strategies adopted to implement the spatial plan are as designate and develop International zones, designate and implement Comprehensive Development Areas (CDAs), encourage and facilitate the development of Malay Reservation Areas, traditional kampungs and new villages, initiate and implement the redevelopment of blighted areas, provide priority and incentives to development in areas around transit terminals, ensure the functional distribution of centres and facilities.

A prime concern of the City must be that its urban centres and facilities are distributed in such a way that they are easily accessible to most its population. To this end, a clear hierarchy of urban centres comprising the city Centre, district centres and neighbourhood centres shall be defined. Appropriate functions and facilities shall be determined for each genre of the centre according to their location, accessibility and catchment area or population Existing centres shall be consolidated and upgraded to meet the requirements of the local community. Larger and

more sophisticated facilities, Mixed-use development incorporating high-density residential, high plot ratio commercial, as well as community and business facilities, shall be encouraged, thus greatly reducing reliance on private transportation by making accessibility flexible and convenient. Bus services shall be closely integrated with rail terminals and interchange facilities provided to facilitate fast, convenient and efficient transport. Pedestrian and traffic linkages, both within and from outside these zones, shall be improved to provide more convenient access to the transit terminals. Authorities shall prepare long-term comprehensive development plans and guidelines which will be implemented over the period. Improvement of basic infrastructures such as roads, utilities and drainage shall be the initial priority and, as opportunities present themselves, improvements to other amenities and community facilities shall also be implemented.

The Plan gave different strategies for improvement of the region and spatial representation also good but it did not make final land use map. The further detailing of different strategies is given in the local plan. The plan formulated is addressing most of the issues facing and the local plans made are clearly stating what are things to do to make **KUALA LUMPUR—A WORLD-CLASS CITY**.

The manufacturing component of employment has declined to 10.5% of total employment in 2000 from 16.8% in 1980, leading to a reduction in the range of employment opportunities in the manufacturing sector. The high rate of net out-migration and low population growth rate. Despite the growth of office and retail space outside the City and the City Centre, there is still an over-concentration of commercial floor space in the City Centre There is a significant quantity of older office buildings which are deficient in basic ICT facilities. There is a phenomenon of unsuccessful shopping complexes in Kuala Lumpur. The failure of some complexes is principally due to poor accessibility, insufficient catchment, unattractive design and the lack of proper market and financial studies. The traditional shopping areas in the City Centre have largely been superseded by the emergence of large-scale shopping malls in various parts of the City. Consequently, there is no longer a clearly defined major shopping area or spine within the City Centre. Increasing demand for service apartments.

A few new permanent hawker centres have been established intended to relocate hawkers. However unsuitable relocation premises for hawkers in terms of accessibility, catchment, comfort and inadequate support facilities are factors that have contributed to the failure of some hawker centres, resulting in hawkers re-establishing their businesses in their original location. There is an inadequate level of market promotion of the City compared to other major tourist cities. In some international tourist destinations, there are a city or regional based tourist boards heavily promoting the destination backed up by a mature tour and travel industry, hoteliers, national and regional airlines and business organisations. Tourist resources are not easily accessible, coherent, well linked to pedestrian movement or supported by services such as restaurants and related shopping. Although Kuala Lumpur has a diverse range of actual or potentially significant tourism resources, the present ‘total tourism product’, being the whole spectrum of tourism services, is inadequate and segmented. Inadequate promotion of traditional handicraft and

souvenir industries. Lack of a clearly identifiable dining and entertainment area in the City Centre. There is under-utilization of major sporting venues.

To create an economic framework for the City which will enable it to achieve its vision to be a World-Class City, the plan aims to enhance the City's global and regional economic role as a leading centre of the knowledge-based Economy, attain a strong and well-diversified economic base integrate with and complement the activities within the Multimedia Super Corridor, attain an optimum population size and distribution.

To enhance Kuala Lumpur's role as an international commercial and financial centre, the Plan aims to:

- Promote Kuala Lumpur as a choice location for international organisations and business entities to establish their regional offices and headquarters.
- Create a technologically advanced city especially in the fields of building technology and design as well as information and communication technology.
- Enhance the City Centre as an international shopping and entertainment centre.

To enhance the role of Kuala Lumpur as an international commercial and financial centre, the Plan aims to:

- Develop Kuala Lumpur as an attractive international tourist destination.
- Increase the average length of stay (ALS) to 3.0 by the year 2010.
- Together with the Kuala Lumpur Tourism Action Council, market and promote tourism in Kuala Lumpur.

For Kuala Lumpur to become an International Commercial and Financial Centre, aims to:

- promote the development of industries related to the Knowledge-Economy;
- promote high-end industries employing highly skilled workers;
- provide to all residents a wide range of employment and business opportunities; and
- maintain a sectoral balance in industrial development.

For making the **KUALA LUMPUR—A WORLD-CLASS CITY** economy is more important. The strategies to achieve economic boost there are proposals for improving the industrial sector and the commerce sector. Very well stated tourism plan also made to attract global tourism by utilising tourism potential.

The vision and goals for Kuala Lumpur have been formulated with the aim of creating a sustainable city. City Hall Kuala Lumpur (CHKL) shall ensure that the planning of the City shall strike a balance between physical, economic, social and environmental development. Local Agenda 21 shall be adopted to encourage citizen participation towards creating a sustainable society. This is in line with government policies of implementing sustainable development strategies as stipulated in the Habitat Agenda of the Rio Declaration.

1.12.9 Case Study 9—London Metropolis [58–60]

Metropolitan profile of London: The 2000-year history of London has been one of constant change. It has grown from a port and river crossing point into a bustling centre of national Government and international commerce. It has been an imperial capital, and a city embracing villages and towns as it grew. It has been home for people in all walks of life, and from all parts of the world. London's population is likely to continue to grow. By the 2020s there are likely to be more Londoners than at any time in the city's history.

Although London's economy has been generally successful over the past twenty years, not everyone has benefited and the incidence of poverty has not fallen. London is an increasingly polarised city. On the one hand, it has seen a major growth in earnings, with significant rises both in the number of those earning high salaries and in the amount, they earn. This leaves those on low incomes or without employment further and further behind. A growing and ever-changing economy—London have always been at the forefront of enterprise and innovation. It already has a diverse range of economic specialisations extending beyond finance and business services. The next 20 years are likely to see continued changes to the London economy, with new sectors and enterprises emerging, building on the capital's rich resources of research and innovation and its world-class universities and specialist institutions.

A city that meets the challenges of economic and population growth in ways that ensure a sustainable, good and improving the quality of life and sufficiently high-quality homes and neighbourhoods for all Londoners and helps tackle the huge issue of deprivation and inequality among Londoners, including inequality in health outcomes.

A city that becomes a world leader in improving the environment locally and globally, taking the lead in tackling climate change, reducing pollution, developing a low carbon economy and consuming fewer resources and using them more effectively (Table 1.16).

The most efficient use will have to be made of London's limited reserves of land, identifying places with the potential for development on a strategic scale, and ensuring policies are in place to enable this to happen. In spatial terms, this will mean renewed attention to the large areas of unused land in east London where there are both the potential and need for development and regeneration (Table 1.17).

It makes clear the Mayor's overall economic development policy objectives to:

- promote London as the world capital of business, the world's top international visitor destination and the world's leading international centre of learning and creativity
- ensure London has the most competitive business environment in the world
- Support London to become one of the world's leading low carbon capitals by 2025

Table 1.16 Spatial strategies-London

Plan	Strategy
Vibrant, connected, and engaged neighbourhoods	
Support neighbourhood driven activities and decision making	• London strengthening neighbourhoods strategy 2015–2020 • Great near campus neighbourhood strategy
Fund and partner with the London public library to support people and neighbourhoods	London public library 2014–2017 strategic plan
Work with our partners in education to help keep neighbourhood schools open and use former school sites effectively	• The London plan (public facilities and services)—draft • Neighbourhood school strategy—new
Diverse, inclusive, and welcoming community	
Support immigrants and newcomers to be successful as they settle in our community	• London and Middlesex local immigration partnership strategic plan • Conference Board of Canada (resource for measurement)
Support all Londoners to feel engaged and involved in our community	• Community diversity and inclusion strategy —new • Consider a gender lens during the development and execution of new policies • Workplace diversity and inclusion
Work to always be a compassionate city to all	• Compassionate cities initiative
Amazing arts, culture, and recreation experiences	
Explore the potential for a multi-use performance venue(s) in London	• Cultural prosperity plan • London's Downtown plan
Invest in new parks and recreation facilities and pursue innovative models for programs and service delivery	• Parks and recreation strategic master plan 2009–2015—update • The London Plan (parks and recreation)—draft
Fund and partner with museum London, the London arts council, the London heritage council, Eldon house, the London public library, and others to strengthen culture in London	• Cultural prosperity plan • Museum London strategic plan • London public library 2014–2017 strategic plan

- give all Londoners the opportunity to take part in London's economic success, access sustainable employment and progress in their careers; and
- ensure prosperity is spread across the capital, addressing areas of deprivation across the city and fostering economic and employment growth in outer London, maintaining the global role of central London and maximising the benefits of investment.

In recent decades London's economy has been increasingly service-based, and this is likely to continue. As a result, ensuring there is enough office space of the right kind in the right places is a key task for the London planning system. Local plans and strategies should support the conversion of surplus offices to other uses and promote mixed use development in the light of integrated strategic and local studies of office demand.

Table 1.17 Economic strategies-London

Plan	Strategy
Diverse and resilient economy	
Work with partners to develop a community economic strategy	• Community economic roadmap—new
Buy and service industrial land to bring more jobs to London	• Industrial land development strategy • Various community improvement plans • The London Plan (City Structure Plan, growth management, and industrial place type)—draft
Support small businesses by improving city processes	• Streamlined approval processes • Service London business • Community economic roadmap—new
Promote culture as a key part of economic growth and quality of life	• Cultural prosperity plan • London music strategy • The London Plan (culturally rich and diverse city)—draft
Urban regeneration	
Create new partnerships to build, and support the building of, new affordable housing	• Housing development corporation strategy • Regenerating public housing plan
Use community improvement plans to coordinate city and private investment to meet both local and city-wide priorities	• Various community improvement plans • The London Plan (urban regeneration)—draft
Invest more in heritage restoration, brownfield remediation, urban regeneration, and community improvement projects	• Various community improvement plans • The London Plan (urban regeneration)—draft
Local, regional, and global innovation	
Use new and emerging technology to improve the quality of life and grow London's economy	• Smart cities strategy—The London Plan (smart city) • Fibre optic—last mile program —The London Plan (smart city) • Municipal best practices
Lead the development of new ways to resource recovery, energy recovery, and utility and resource optimisation with our local and regional partners to keep our operating costs low and assist businesses with commercialization to help grow London's economy	• Partnerships with Budweiser gardens, covent garden market, and London hydro • Community energy action plan • London waste to resources innovation centre • International water excellence centre
Diverse employment opportunities	
Improve workforce recruitment, development, and retention by working with local and regional partners	• London economic development corporation workforce development
Remove barriers to employment through the expansion of the City of London internship program	• City of London internship program (to include foreign trained professionals)
Attract and retain newcomers, including international students, foreign trained professionals	• Immigration strategy—new • London Middlesex local immigration partnership

Economic development strategy provides further detail on realising London's potential for economic growth

The London Plan sets out a new approach for planning in London. It emphasises growing inward and upward so that it can reduce the costs of growth, create walkable communities, revitalise our urban neighbourhoods and business areas, protect our farmlands, and reduce greenhouse gases and energy consumption. The plan sets out to conserve our cultural heritage and protect our environmental areas, hazard lands, and natural resources. Through the London Plan, the community is planning for vibrant, healthy, safe and fulfilling neighbourhoods, attractive and viable mobility alternatives and affordable housing that is accessible to those who need it. At the root of The London Plan is the goal of building a city that will be attractive as a place to live and invest in a highly competitive world and one that will offer the opportunity of prosperity to everyone—one their own terms and in their own way.

1.12.10 Case Study 10—Berlin Plan 2035 [61, 62]

The capital and the largest city of Germany, Berlin is a world city of culture, politics, media and science. With a population of approximately 3.5 million, Berlin is the second most populated city proper and seventh most populous urban area in the European Union. It has a population density of 4100/km^2. Its economy is based on high-tech firms and the service sector, encompassing a diverse range of creative industries, research facilities, media corporations and convention venues. Modern Berlin is home to world-renowned universities, orchestras, museums, entertainment venues and is host to many sporting events. The city is well known for its festivals, diverse architecture, nightlife, contemporary arts and a high quality of living.

Berlin possesses a special atmosphere that makes the city a desirable place to live, attracting people from all over the world. While many cities fail to achieve poly centrality, Berlin boasts of a polycentric spatial arrangement with short distances between centres and a wide array of local offerings in mixed-use centres in the inner and outer city. The city is continually changing and Berlin possesses a high degree of creativity to employ in changing it, to make it further development of the city of short distances. However, there separate centres with functional or aesthetic failings in the inner and outer city. With a high quality of life, the problems faced by Berlin are mostly environment related. These include strong air and noise pollution, low prevalence of renewable energies, large ecological footprint, climate change impact such as a rise in average annual temperature, a decrease in annual precipitation, more frequent extreme weather events.

This plan talks about continuing and improve the concept of neighbourhood diversity. Berlin mix and its special quality of life remain a unique feature of the growing city. These neighbourhoods are known for their unique social, multi-ethnic and multi-functional mix. The development proposes 25 major new residential development sites housing offering the potential for some 50,000 dwellings. Similarly, other development concepts are explained in Table 1.18.

Table 1.18 Spatial strategies-Berlin

Objective	Strategy
Supporting neighbourhood development	Forces are pooled to safeguard the social mix and to promote the distinct characters of different neighbourhoods, spaces for social interactions as well as safety and cleanliness
Creating living space	Housing and property development policy are designed to maintain reasonably priced living space and to create new, affordable housing
Safeguarding local shops and services	Tailored and resource efficient development of neighbourhood and centre friendly local retailers and social, cultural and transport infrastructure
Advancing high-quality inner development	Densification of the existing urban environment involving the re-use and conversion of existing structures
Connecting and enhancing free spaces	Improve connections between residential centres and open spaces in the city
Safeguarding and improving ecological qualities	Protection of natural resources such as soil, green spaces, water, climate and air
Preserving and developing green and open spaces	Green and open spaces are preserved and upgraded as recreation and climate change compensation areas
Making public transport more attractive	Expansion of the system to meet demand, to increase reliability, to maintain infrastructure and vehicles, and to ensure accessibility and affordability
Increasing bicycle and pedestrian traffic	Bicycle and pedestrian strategy and making eco-mobility more attractive
Developing an integrated commercial transport plan	Measures designed to reinforce e-city logistics, improve multi-modality and increase cooperation in commercial transport

Berlin's economic situation has seen positive progress in recent years, yet it continues to struggle in terms of job creation and job security as well as income levels. However, the city enjoys comparative advantages, particularly in its capacity as a location for knowledge and innovation. Berlin is a renowned hub of knowledge. Berlin plan proposes consists large-scale infrastructural investments, an efficient freight transportation hub, and highly effective networking within the surrounding region. Whilst enjoying a good number of outstanding universities and institutions of science, concentrations of scientific institutions in the inner and outer city, and private research institutions there is a grave problem of unemployment amongst the youth. The economic activity is predominantly in the inner city, the per capita income is low. A comparatively weak representation of companies and industries with high added value is observed.

Berlin 2030 is proposing to enhance as a business location by the influx of talented individuals from around the world, skilled workers and entrepreneurs who boost innovation and promote international networking. The plan proposes to further improve the innovative potential; every third company in the capital region is to be active in five innovative clusters. It also aims at upgrading the labour

market, provides a comprehensive education and research landscape. The proposed strategies are discussed in Table 1.19.

The Strategy for Berlin, with its goals and fields of action, represents a citywide response to urban development and will affect the city. For its implementation, the development plan proposes ten transformation areas which provide focus attention on selected areas and offer responses to Berlin's major challenges and opportunities. They focus on the issues of population growth, economic structure, the capital city function, social cohesion, and climate change and energy transition as they affect Berlin. The transformation areas offer development potential relevant to the whole city in terms of both social issues and open spaces.

Table 1.19 Economic strategies-Berlin

Objective	Strategy
Intensifying knowledge and technology transfer	Networks and measurements used to consolidate science, research and business for exchange, impromptu meetings and transfer
Implementing the idea of Berlin as a smart city	Information and communication technologies used, post-fossil fuel society
Improving networking between learning institutions	Networks and partnerships are intensified across the state border
Developing multiple innovation hubs	Create space for innovative entrepreneurial activities, particularly those focused on future technologies
Safeguarding and developing important industrial and d commercial sites	Locations for the manufacturing sector are fortified and (potential) development sites are safeguarded and developed
Promoting start-ups	Conditions for start-ups (services, contacts, capital, and space) are improved to accelerate business development
Conditions for start-ups (services, contacts, capital, space) are improved to accelerate business development	Training and support provided to bolster employment, measures designed to improve the family work balance are promoted
Establishing a 'welcome culture'	An enlightened, non-bureaucratic attitude towards the integration of migrant workers and businesses, including the provision of foreign language capacity within local authorities
Safeguarding employment through education and skills	Providing a high-quality educational infrastructure Developing kindergartens and schools as the the foundation of the educational landscape Transforming libraries into centres of out-of-school learning and educational partners Turning educational establishments into inclusive establishments Safeguarding and strengthening out-of-school educational venues

Berlin development concept 2030 is the second part of the study, the first being the present situation study. With thorough analysis followed by extensive public participation in the planning process, the plan inculcates the opinions of the people. To safeguard the employment opportunities, the plan talks about enhancing and strengthening education right from the kindergarten level followed by various out of school-related activities in the higher level. The economic aspect of the city is planned efficiently, along with strong emphasis on the social and cultural aspects. It defines a progressive and innovative development plan.

The Berlin Strategy provides an inter-agency model for the long-term, sustainable development of the capital. With one-third of the city comprising of open spaces, a compact polycentric development, highly tolerant society, the development plan further proposes to enhance these key selling points of Berlin. The development plan builds its foundation on the strong points of Berlin and proposes strategies to tackle the challenges. Provisions of affordable housing, further increasing the short distances to amenities, enabling a start-up friendly environment are some of the key proposals of the plan. Cultural diversity and tolerance in the society are used as a selling point for the attraction of workforce and tourists. Community participation is given utmost importance. The economy focuses on the educational institutions, research centres, attracts skilled labour from all over the world. Using a range of strategies and goals, it sets out the areas and directions in which this growing city should develop and highlights the areas that will form the focus of its future development.

1.12.11 Case Study 11—Dhaka Structure Plan 2016–2035 [63–65]

Dhaka is the capital and largest city of Bangladesh. It is one of the most populous cities in the world with a population of 17 million in the Dhaka Metropolitan region. The area stretches over 1400 km^2. It is the third most densely populated cities in the world. The planning area includes four city corporations- Dhaka South, Dhaka North, Narayanganj and Gazipur City. Dhaka is home to thousands of businesses and international corporations and the biggest employment GDP generation of the country. Migration of people from rural areas is one of the reasons of the growing population. Dhaka will be home to 25 million people by the end of 2025 and will be a meta city as per UN estimate.

Like most of the mega-urban regions of the world today, there is a functional relationship between the Dhaka city centre and the smaller urban centres. More and more people are commuting to their workplace located within the core city of Dhaka from surrounding settlements like Narayanganj, Gazipur, Tongi, Savar, and Keraniganj. With the rapid increase in urbanisation, Dhaka experiences degradation of the urban environment, its air, water and soil have been polluted to dangerous levels. It has also caused heavy demands on urban utilities and services like electricity, gas, water, sanitation, sewerage, garbage disposal, transport, telephone,

cables; and social services like health and education, etc. For the millions of rural poor in Bangladesh, Dhaka is still the most attractive destination for economic activities, leading to massive migration from rural to urban areas. About 63% of the total growth of Dhaka's population is due to migration and only 37% growth comes from natural increase. Most of these poor people are unable to afford habitable housing or other socioeconomic services. The consequence of this is the growth of unhygienic slums and squatter settlements. Wetlands encroachment is another issue because of excessive development pressure, any land would be lucrative for physical development and construction because there would be demand for it. Another serious issue is in the transportation sector, which includes poor public transport system, lack of coordination, the presence of rickshaw in major road corridors, inadequate pedestrian facility.

The planning area is divided into two strategic zones like Urban Promotion Area (UPA) and Urban Control Area (UCA), largely based on the possibility of future urbanisation. Urban Promotion Area has been further sub-divided into three strategic management areas like Central Urban Area, Outer Urban Area and Growth Management Area; while Urban Control Area has been sub-dived into two strategic management areas like, Agriculture and Conservation Area (Flood flow zones, Water Retention Area, National and Regional parks, Forest Area, large scale Heritage sites). The theme of the current structure plan is to diffuse the major functions performed by the central city and redistributing it to different urban centres (Polycentric approach). This will help create a hierarchical framework of different magnitudes of centres providing corresponding levels of services and employment opportunities. The main components of the concept are: Changing urban structure, reducing trip generation and traffic and enhancing local accessibility. Some of the strategies along with their implementation are listed in Table 1.20:

Table 1.20 Spatial strategies-Dhaka

Objective	Strategic action	Implementation
To enhance local accessibility	Decentralising urban functions and services, compact development	Division of planning area into 6 functional regions
To promote compact urban development	Utilize planned unit development (PUD) concept, promoting urban centres with appropriate densities, services	Make necessary amendments, development near high quality public transport
To mobilise the under-utilised lands within the city	Rigorous redevelopment or rehabilitation plan for these areas, Seek possibility of PPP with private sources of fund	Prepare revised land use plan of required areas, detailed plan for Dhanmondi to define and provide upgraded/rehabilitated utility services is required in view of densification
To enhance the linkage between land use and transport network	Coordinated approach to transport planning with the help of TOD	Promote proposed urban centre based development to reduce travel demand

The economy is the foundation of urban agglomeration and eventual progress of an urban community. Dhaka is basically a low-income economy. It is situated in a strategic location but currently not generating expected level of return for lack of infrastructure and services. With a huge population, there is no problem of labour. There is also a steady growth of export-oriented sectors for example garment industry. Other growing trends are the emergence of leather, information technology, finance infrastructure domestic financial resources including remittances and the service sector. The informal sector comprises of 65% of all employment in the city is a sector which needs to specialise. However, the poor infrastructure and services are inadequate for the economy as well as an institutional weakness to support business development. Other issues include traffic congestion causing loss of time and productivity, high interest on bank credit and a limited supply of urban land and infrastructure despite the high urban land price.

Specific policies have been provided for making Dhaka's economy increasingly productive and functional, which includes development of commercial hubs within different potential areas of DMR, promotion of compact and clustered industrial growth, promotion of exclusive industrial zones, relocating polluting industries, facilitate development of ICT sector in the Dhaka core area, promoting woven garment and knitwear in peri-urban areas of the metropolis and recommendation for limiting growth of garment factories in the central urban area, etc. Some of the strategies with their implementation have been discussed in Table 1.21:

A major drawback in the Dhaka Structure Plan 2016–2035, as pointed out by several concerned people, is non-involvement of the public's opinion or other concerned authorities. The local waste management is not addressed in the spatial planning. While the concept of discouraging plot based housing is a good concept, the option of building apartment housing and building individual housing can be made taken into consideration. The plan proposes major projects like Transit Oriented Development and five new ring roads. The process of acquiring land for such projects may not always be people friendly and is not efficient in a densely-populated brownfield settlement.

The Dhaka structure plan covers the basic issues such as effective land use management, transport for efficient connectivity, enhancing employment and productivity, public Facilities, protecting the natural and healthy environment. The spatial concept of dividing the planning area into two broad categories i.e. Urban Promotion Area (UPA) and Urban Control Area (UCA) is an efficient way to assure uniform distribution of development. Here, the basic requirements are made available at each functional region reducing the dependency on the core city. At the same time under the UCA flood flow zones, Water Retention Area, National and Regional parks, Forest Area, and large scale Heritage sites are preserved. Instead of focussing on individual plot based development, the concept of planned unit development is introduced. The plan talks about increasing the productivity of the informal sector, which is a good step towards mitigating urban poverty. The garment sector, leather manufacturing which boosts women employment is also planned to make it more efficient. While the report covers all the broad aspects

Table 1.21 Economic strategies-Dhaka

Objective	Strategic action	Implementation
Establish exclusive economic zone for leather industries in growth management area	Select strategic locations for establishment of new and relocation of existing leather industries and provide necessary infrastructure and services including ETP	Provide all services and facilities in the selected area-power, water, waste management, drainage, etc., arrange easy and reasonable interest credit facilities for investors
To elevate informal economic activities into higher productivity levels	Selection of site for providing informal business activities, formation of an appropriate tenure arrangement, establishment of a small scale replicable demonstration project	Space allocation to relocate informal enterprises with appropriate level of charges, skill development training to promote higher production and quality products, providing collateral free soft credit to upgrade business
Relocate and/or cluster polluting industries at suitable locations	Select strategic locations for establishment of noxious industries	Provide common ETP to treat pollutants at low cost before discharging into open water courses, provide incentives for relocation and export
Locate, declare and promote selected areas as exclusive industrial zones	Recognition of the as industrial clusters and priority facilitation, selected areas to be developed as a specialised centre where industrial agglomeration in planned way will be the major functions within those areas	Connect industrial areas by efficient public transport, Give priority in industrial plan approval, Provide incentive to industries in the form of tax holiday, duty-free import of machinery, credit facilities

required for the development of a region, the involvement of the public in the planning process would provide a more achievable and efficient plan.

1.12.12 Case Study 12—Master Plan for Patna Metropolitan Region 2031 [66]

Patna is the capital city of Bihar State in India situated 15 km along the confluence of the River Ganges. Patna is the important administrative and educational centre of the State. Out of 53 million plus cities (2011 Census) in India, Patna is 18th in rank with a total Urban Agglomeration population of 2046,652. Patna is the largest Corporation with 44.1% share of the population of 7 corporations, and 20% of the total urban population of Bihar State.

Patna being the capital of one of the economically backwards state of India with all kinds of disadvantages, it becomes necessary to develop Patna as a National

Level Competitive City so that it can reduce the impact of various kinds of disadvantages present in the Bihar economy. In last ten to fifteen years, Patna is developed as emerging trade and business hub in Eastern India. Therefore, the vision of The Master Plan of Patna should be to make it a National Level Competitive City and Regional Trade Centre in Eastern India by next two decades.

The Master Plan Vision for the year 2031 is "To develop Patna Planning Area as a modern economic region with locally competitive infrastructure and social amenities to address future requirements in harmony with its ecological resources".

The development strategies adopted in the Master Plan are as follows:

1. Creation of a compact city to achieve sustainable development.
2. Transit Oriented Development (TOD) is proposed along the major corridors, which will emphasise movement through public transport. The above-mentioned Centres are well-linked to the core city. Integration of the peripheral areas with the core and intermediate areas, so that the entire area acts as one entity (through TOD).

Creation of Growth Centres (GC) and Satellite Towns: Proposing multi-nuclei centres will help reduce pressure on the core area. Proposing Master Plan with the objectives of protecting rural livelihoods, catering to the needs of the population by providing agricultural zones and Provision of adequate infrastructure to influence overall development in the region are good proposals.

Spatial Strategy

A spatial strategy which is to be adopted in Patna rests on the basic concept of 'Multiple Nuclei Model'. Creating multiple nuclei centres/sub-centers will help to take the overload from the centre or core nuclei. These nodes/nuclei centres are identified as physical demarcation/accumulation of cluster of activities. Various urban nodes proposed in Master Plan are commercial, Transportation, and Industrial nodes. The different options for this development model are given.

1. Growth options for Multiple Nuclei Model.
2. Proposed Land use 2031.

The proposed land use shows the application of this spatial strategy. The Spatial Strategy focuses on achieving a single aim of decentralisation. The growth model proposed here is Multiple Nuclei model, which is achieved by land use. Though TOD is mentioned as a Strategy for development, it is not addressed in any of the sections and remains untouched. To promote industrial based economy 60% of secondary workers is accommodated in Industrial land use, while and rest 40% to be accommodated in Commercial/Institutional and Mixed land use. For secondary workers, the area per person required is 50 m^2/worker, therefore total area required for industrial land use is 966 ha.

The Economic approach in the Master Plan is only by addressing the land requirement for various employments generated. There is no mention about Economic Strategy.

The Metropolitan plan for Patna, though it takes into consideration, the Economic aspect of the city, doesn't provide a sufficient Economic Strategy for development. The plan has a concept for the spatial development of the city. The spatial strategy is fairly achieved. The Implementation plan simply explains a case study for TP schemes from Ahmedabad. There is no strategy adopted. Also, it doesn't consider each project in detail.

Patna being the only important city in the state has acquired the strong position in regional trade and business. It is necessary to have an economic strategy while planning for Patna. The Master plan lacks this. Instead, an overall development which also leads to economic development is attempted. Implementation plan doesn't consider every project in detail.

1.12.13 Case Study 13—Montreal Metropolitan Development Plan 2020 [67]

Montreal is the largest city in Canada's Quebec province. It's set on an island in the Saint Lawrence River and named after Mt. Royal, the triple-peaked hill at its heart. The planning area is a City of 500 km^2. There is an expected 60,000–75,000 new housing units over the next 10 years. There are 180 km of the waterside roadway to be enhanced and 11 km^2 of vacant land to be built throughout the City.

The Plan is the result of a planning and the cooperative process initiated at the Montreal Summit in June 2002. The Plan presents a planning and development vision for the City, as well as measures for implementing the goals and objectives resulting from that vision. The main issues raised were the following: Quality of life; Transportation problems; Presence of a healthy natural environment; Protection and enhancement of the built heritage; and Community facilities.

The City intends to consolidate the existing features of established areas, which cover most of Montreal's territory. Many areas are underused and ripe for transformation; The City intends to develop these areas by attracting new activities and buildings. The City favours high-quality urban design and architecture (Table 1.22).

Development strategies are categorised into seven sections. Under each section, strategies, their objectives and action plans are defined. Corresponding Projects and proposals are defined. The spatial strategy is based on three aspects. Under each aspect, the implementation program or the action plans are also given in detail.

The Economic centre of Quebec, the Montreal metropolitan area had 2,030,000 jobs in 2013 (Table 1.23).

There are three types of components in a Smart Metropolis: technological, human and institutional. Technological factors involve implementing physical infrastructure, creating applications and setting up platforms (ICTs). Human factors focus on individual interactions and spaces that foster such interaction. Institutional factors refer to policies; regulations and governance that will help make the metropolitan area smarter (Table 1.24).

Table 1.22 Spatial strategies-Montreal

Strategy	Implementation
Promoting an excellent living environment	• Developing tools to support a wide range of housing, including affordable accommodations • Promoting a full line of public facilities and ensuring easy access • Encouraging a commercial presence tailored to community needs
	• Promoting the use of public transit and active transportation through urban design and infrastructures • Adapting to climatic change by greening our spaces and building, along with effective rainwater management
Fuelling vitality of the urban agglomeration and its central core	• Supporting the central core's multiple functions, while boosting the sector's international renown • Expand and improve the public transit and active transportation network • Formulating an access plan for the different centres based on complementary forms of transportation • Building major road projects connected to intermodal platforms to optimise freight transportation
Enhancing areas of interest	• Stepping up regulatory measures to protect heritage and laying out rules for new construction • Expanding protected areas from 5.8 to 8% of the land • Producing conservation plans and adopting regulations to govern activities in ecological sectors • Protecting important scenic views and portions of the shoreline road • Including key heritage, ecology and scenery attractions on the green and blue nature network

Table 1.23 Economic strategies-Montreal

Advantages	Challenges
• Diversified economy with many industrial clusters of excellence • Mobilisation within industrial clusters • High quality of life • Low business operating costs • Attractive tax environment for businesses	• Low productivity • Low university graduation rate • Mismatch between workforce and business needs • Low private investment • Need for industrial space development • Deficient transportation infrastructure
• Abundance of research centres, colleges and excellent universities • Efficient freight transportation hub	• Untapped potential of the creative industries

Table 1.24 Smart economic strategies-Montreal

Focus	Strategy	Implementation
Focus on economy's strengths	Support the development of metropolitan clusters	›› Update the sectors of excellence profiles ›› Foster inter-cluster activities ›› Develop practices and tools that stimulate innovation ›› Develop an outreach strategy for metropolitan clusters
	Support consolidation among the industries of the creative economy	›› Evaluate the need for and feasibility of activating new metropolitan clusters to help structure the creative industries
	Promote the metropolis as a logistics hub	›› Develop a promotion strategy for logistics and transportation
Optimise production factors	Stimulate private investment	›› Implement the strategy for enhancing industrial spaces ›› Implement Montreal international's foreign direct investment strategy
	Provide the metropolis with a high-quality workforce	›› Implement Montreal international's talent attraction strategy ›› Support initiatives for retaining foreign students ›› Support initiatives for matching workforce to business needs ›› Support initiatives for improving student achievement, university graduation rates and job market access
Provide metropolitan coherence	Make Greater Montreal a leading smart city	›› Support and guide the smart city initiatives of municipalities in the region and encourage networking between them
	Mobilise metropolitan economic stakeholders	›› Hold a biennial meeting with the stakeholders of the Montreal model ›› Provide coherence between initiatives aimed at the economic positioning of Greater Montréal in partnership with the stakeholders of the Montréal model

Economic strengths are utilised and creative market and the smart economy are aimed to achieve through these strategies. A clear and comprehensive economic strategy is provided in the Master plan. The implementation strategy to carry out each strategy is also explained. The idea of Smart Metropolis is carefully dealt here which is considered as the most innovative and sustainable development concept in the current scenario.

Montreal being a large city with a diversified economy needed a spatial and economic strategy which is formulated and explained well in the Master plan. Issues and potentials were identified and addressed carefully.

1.12.14 Case Study 14—Helsinki [68]

Greater Helsinki is the metropolitan area including the smaller Capital Region urban kernel and commuter towns surrounding Helsinki, the capital city of Finland. It is in the south of Finland, on the coast of the Gulf of Finland, which is part of the Baltic Sea. The Population density is 2945.09/km^2 and the Population density for Greater Helsinki is 389.88/km^2.

The key strategic issues include:

- The growth of Helsinki and its region is beneficial to the whole country.
- The main city-centre will be expanded.
- Social unity is strengthened by satisfying people's needs now and in the future.
- The city-region grows urbaner and improves the environment.
- By building the region also towards the coast, the region will retain its vitality and the balance of the regional structure will be improved (Table 1.25).

A Lively Cityscape

- Creation of a high-quality urban environment together with the protection of the existing city landscape.
- Cities have created their own landscapes, employing the intersections between water, terrain and natural paths.
- Cultural and natural environments located in the city-region is to be made usable by the city dwellers for diverse outdoor and recreational activities Improving the quality of the green network. Special nature reserves will be preserved: Historical urban parks as well as modern parks of international quality, beach promenades and other public outdoor spaces.
- Recreational islands and their ferry connections will be improved.
- Conditions for boating, summer activities, hiking and tourism will be improved (Table 1.26).

The spatial strategy discusses are on the city landscape, green networks and traffic and transport. All these are linked together and the green city network enhances city life with fresh environment and aids in protecting the environment

Table 1.25 Spatial issues and potentials-Helsinki

European city-identity	– Tradition and history as in the typical European city in building and cultural landscapes
Climate change	– Create a low-carbon city-regional urban structure – Energy-efficient and ecological construction
Mitigating against urban sprawl	– Building more intensely within the city-region's development corridors – Communities will be made more compact
Radial and circular structure	– Cross-town and radial ring-road urban traffic structure

Table 1.26 Spatial strategies-Helsinki

Spatial strategy	Implementation
City landscape	– Continuous cityscapes extend beyond the administrative border and their characteristics will be emphasised and the areas will be developed
Green networks	– Accessibility to the green city network and recreational areas, preservation of natural diversity and landscape culture
Traffic and transport	– Access to green networks and recreational areas, choice of modes of transport but preference to walking, cycling and public transport

and heritage. The transportation is focusing on walking, cycling and public transport for a sustainable future. The inner city is connected to the residential areas by central park. Bay city landscape is very innovative and efficient—sustainable. Recreational island development promotes tourism and enhances the environmental quality of the place. Suburbs are placed such that it prevents urban sprawl. Extending the city centre and areas of specialised clusters:

- the main centre will be developed, strengthened and expanded as a regional and national centre.
- services related to finance, culture, leisure and tourism will be promoted.
- Busy passenger harbours connecting Helsinki to the other cities bring significantly tourist flows to the centre.
- business activities in the city become stronger—expanding airport logistical hub and improved international accessibility and fast connections within Finland.
- ring motorways and railway lines will act as a focus to improve business accessibility.

Income distribution is not evenly distributed, such that 20% of the highest income group uses 64% of the resources and 20% of the lowest income group uses 4% of the resources (based on 1994 statistics) (Tables 1.27 and 1.28).

The spatial structure for the economic/business development is mentioned. But the kind of economic activities is not clear even though the zones are marked. The spatial zoning of economic activities is done such a way that it is around the city centre and large-scale industries are placed away from the centre which has easy access from nearby places. Retail activities are evenly distributed in all area. The

Table 1.27 Basic strategies-Helsinki

European integration and Globalisation	– Helsinki city-region will be developed as a European city – Public transport projects will be developed
From monocultural to multicultural	– Need to take into account the increase in immigration as well as in the development of business activities
Governance	– Greater cooperation between the neighbouring municipalities a more integrated approach
Infrastructure	– Form a compact urban structure – Infrastructural changes as cost-effective and ecologically sustainable

Table 1.28 Economic concept and strategy

Economic strategy	Implementation
Business growth	– The increase in the number of inhabitants and jobs
Helsinki's city-centre	– The centre of Helsinki and the areas around it will offer competitive spaces for business activities
Workforce	– Different types of housing solutions for different built according to demand for business activity development
Connectivity	– Cross-traffic connections and goods traffic
Technological development	– Technological innovations
Workplaces	– Building residences and business premises side by side, particularly around public transport interchanges – Create mixed areas of residential and commercial – New logistical corridors of rail and Ring Road constitute the framework of the goods maintenance service hub – Business opportunities for growth near and around the city centre will be promoted

plan analyses the future of the city-region and its development needs and presents a Vision of the city region's future principles

- sets out the economic, social and environmental relationships and their impact physically upon metropolitan development for the next 30 years.
- integrated relationships are set out in a series of policies grouped around key issues of business activities (economic strategy), housing, city-landscape (spatial strategy) and regional structure.
- developed into a set of spatial strategies under each main heading which in turn form the physical demands of city-regional growth.

1.12.15 Case Study 15—Istanbul 2014–2023 [69]

The Istanbul Metropolitan Area is in the north-west of Turkey. It has an area of 5343.02 km^2 (2062.95 sq mi) and a population of 14,804,116 as of 2016. Istanbul Development Agency perceives development as a multidimensional holistic concept; including the development of social rights alongside economic development, environmental conscience, and protection of cultural values; and acts with an understanding of development which mobilises the potential of all segments of society. The Plan's vision for 2023 rests upon Istanbul's uniqueness. The vision of the 2014–2023 Istanbul Regional Plan is "Unique Istanbul; City of Innovation and Culture with Creative and Free Citizens". The milestones of the 2023 Vision consist of 23 Priorities and 57 strategies, which rise on 3 main axes determined for the city's economic, social and spatial development.

In the second half of the 20th century, the Asian side of Istanbul experienced major urban growth; the late development of this part of the city led to better infrastructure and tidier urban planning when compared with most other residential areas in the city and functions as a suburb of the economic and commercial centres in European Istanbul. Because of Istanbul's exponential growth in the 20th century, a significant portion of the city is composed of illegally constructed squatter buildings.

Large scale gentrification and urban renewal projects have been taking place. The Turkish government also has ambitious plans for an expansion of the city west and northwards on the European side. Istanbul does not have a primary urban park, but it has several green areas. Istanbul's unplanned urbanisation is to be transformed, and the city must be prepared for disasters, without neglecting urban arrangements; with full consideration for quality, contemporary design, aesthetics and architecture. With the intention of being an international logistics centre, the city's transportation system, logistical competitiveness, and quality of logistical infrastructure and services will be improved. Transportation capacity to urban zones, and to other regions and countries will be boosted. Natural resources under pressure from construction, such as water basins, forest areas, and green areas and parks in urban areas, will be protected, and their sustainable development will be ensured. The use of environment-friendly energy and sustainable waste management will be adopted. In 2023, creative and innovative people will freely lay out their potential in Istanbul with its enjoyable and authentic urban spaces and sustainable environment.

The spatial concept for Istanbul Development Plan is determined as "Joyful, Authentic Urban Spaces and Sustainable Environment". As the living standards of people in Istanbul to be enhanced, 9 priority areas and 21 strategies were determined for facilitation of their participation in social and economic processes and enabling them to live amongst nature simultaneously with urban life. In the plan period, smart and sustainable urban development of Istanbul is targeted, with an inclusive and holistic planning approach based on cooperation and participation. In this process, protection of environmental and natural heritage, and preservation of their sustainability, as well as Istanbul memory and the historical and cultural heritage of the city, which is the source of its authenticity, need to be protected (Table 1.29).

The spatial strategy considers urban planning, transportation, environment, architecture and heritage in a sustainable manner ensuring sustainable development in a public participatory approach. The implementation part is still lacking as if in the economic strategy which is very critical for the plans to become a reality.

Historically, Constantinople has been the centre of the country's economic life because of its location as an international junction of land and sea trade routes. In 2012, the City of Istanbul had a GDP of $332,4 billion. In 2008, companies based in Istanbul made exports worth $41,397,000,000 and imports worth $69,883,000,000; which corresponded to 56.6 and 60.2% of Turkey's exports and imports, respectively, in that year. In 2006 Turkey's exports grew a further + 16.1% while import grew +17.6% because of a rising demand for energy

Table 1.29 Spatial strategies-Istanbul

Domain	Spatial strategy
Sustainable urban development and participatory planning	• Ensuring sustainable urban development and smart growth, efficient use of space in the distribution of urban functions • Dissemination of participatory based collaborative, inclusive and holistic planning
Spatial quality, authentic design	Improving quality of urban function areas, their fair distribution, and the options available to urban inhabitants Ensuring high-quality urban design, spatial authenticity and diversity, in harmony with the urban identity
Holistic and inclusive urban transformation	• Ensuring urban transformation in Istanbul by integrative planning, taking into account regional needs and lifestyles and the balance of intra-regional development • Ensuring a spatial transformation which will facilitate the development of the industry, and that will reduce the adverse impacts of industry on the city
Protected Istanbul memory and cultural heritage	• Protecting the components forming the Istanbul memory, and tangible and intangible cultural heritage, with the historic urban landscape approach • Protection of historical areas and urban heritage as urban living areas, and ensuring acceptance by the citizens of Istanbul
Effective disaster management	Enabling the disaster management system to create a safe Istanbul with high quality of life and space
Sustainable transport and accessibility	Improvement of public transport infrastructure and services, and promotion of public transport Enhancement of transport facilities for and encouragement of walking and cycling • Improvement of accessibility to Istanbul • Effective management of transport demand and efficient use of existing transport infrastructure
Quality and sustainable environment	• Ensuring the sustainable management of basins and water sources • Protection and development of forests and agricultural areas • Protection of marine and coastal areas and improving their quality • Controlling and improving air quality • Reducing solid waste and wastewater, and ensuring their sustainable management • Reduction of resource use and waste generation in industrial activities, and ensuring sustainable waste management

resources and raw materials by the industrial manufacturers in the country. Income distribution is not evenly distributed in Istanbul, such that 20% of the highest income group uses 64% of the resources and 20% of the lowest income group uses 4% of the resources (based on 1994 statistics). In the late 1990s, the economy of Turkey, and Istanbul suffered several major depressions. The Asian financial crisis, as well as the crisis in Russia, had negative effects in all areas of the economy, particularly on exports. Following this setback, a slow reorganisation of the economy of Istanbul was observed in 1999.

The major earthquake which was epicentre in nearby Kocaeli on 17 August 1999, triggered one of the largest economic shocks for the city. Apart from the capital and human losses caused by the disaster, a decrease in GDP of approximately two percent occurred. Despite these downturns, Istanbul's economy has strongly improved and recovered in the recent years. The economy is designated to create a "Globally Decisive, High Value-Added, Innovative and Creative Economy" in Istanbul. 7 Priority areas and 19 strategies were specified to reach a globally decisive position in the economy beyond integrating into the global value chain. The aim is to transform Istanbul into a global centre of attraction with innovation, creativity and high value-added activities, and to accelerate this dynamism to gain a powerful position in the global value chain by attracting qualified labour and investments to the region (Table 1.30).

The economic strategy discusses all the sectors to make a globally decisive, high value added, innovative and creative economy. The focus has been given to entrepreneurship to encourage the work participation thereby eliminating unemployment that would lead to a better vibrant economy. The main idea of entrepreneurship is to be appreciated as the city will sustain its own economy rather than depending on external revenue as in trade. Even though the strategies and objectives are discussed elaborately the implementation is not detailed which makes it difficult for the region to put these concepts into reality. The Metropolitan Plan discusses a vision for Istanbul, spatial and economic strategy.

The very important part was the public participatory approach so that the people of the place make the place. All the strategical domains are made with the opinions of the citizens and thereby solve their issues and each project is for the development of the city and the citizens. The economic domains include the transformation of the industry, ascending R&D, encouraging entrepreneurship, increasing employment. All these directly or indirectly stand for the citizens. The spatial domains are increasing spatial quality, holistic urban transformation, protecting the culture and history, effective disaster management, sustainable transport.

1.12.16 Case Study 16—Limerick [70, 71]

Limerick city is in Ireland along the River Shannon. It is the third largest city in Ireland having a rich culture and history. The metropolitan area is newly formed and it is the principal urban centre of Mid-West. The city has a major role in

Table 1.30 Economic-strategies-Istanbul

Domain	Economic strategy
A strategic actor in the global economy	Becoming a global centre of attraction in the economy Strengthening Istanbul's foreign trade
Competitive position in the global value chain	Specialising in sectors with which Istanbul can demonstrate its global competitiveness and acquire high value-added functions in the international value chain, and developing these sectors
Transformation in the industry	Creating an industrial production structure which uses advanced technologies, produces high value-added, and employs skilled labour
Ascending R&D and innovation	Developing cooperation between stakeholders, initiatives that promote coordination and sharing Establishing social consciousness and awareness by expanding the R&D and innovation
Qualified entrepreneurship	Disseminating entrepreneurship culture, improving the quality of entrepreneurs Improving existing cooperation in the Istanbul entrepreneurship ecosystem and establishing new partnerships; providing fast and secure access to high-quality Information
Transforming the workforce, developing and increasing employment	Increasing employment, reducing unemployment Transforming the workforce in line with the changing economic structure Facilitating the matchup between labour supply and demand Improving the work environment to support creativity, innovation and inclusiveness
Urban image and effective publicity	Developing a corporate strategy, cooperation and institutional structuring for the publicity and urban image of Istanbul Expanding activities related to the publicity and image development of Istanbul, and conducting these activities effectively Preserving and using local resources and values to improve and publicise urban image; improving related infrastructure and services

defining the economic fortunes of the region as well as Ireland but now the city is having negative growth in terms of development.

Limerick is it is having strengths, but it is not being utilised. Limerick metropolitan area is surrounded by Irish economy and European economies which are performing very well and having good economic interactions with the world. So, the aim of Limerick Metropolitan area is to understand the strength potential opportunities and weaknesses of them and plan a better limerick with strong economic activity.

Limerick is a place having several educational institutions like the University of the Limerick, Limerick Institute of Technology, Research institutes, and ICT institutes. The academic institutes can act as nodes for pushing economy because these institutes are the places gifting new talents to the society if that assets are taken care of by providing job opportunities and facilities it can develop a rise to the current economy. Another positive of Limerick is its high-quality infrastructure facilities like Business Parks, Incubators and mentoring centres for giving training for start-ups, improved road links to Dublin and other Irish cities. These facilities may attract businesses to invest in the City. The well-established link with U.S is an asset for the city which has potential to up bring the economic activities in the Limerick. The presence of well-built and highly connected Airport and Docks which act as intermediate for economic interactions. Historic buildings can increase the tourism potential of the area if they are maintained in a good manner. the city is having some weak points also. Availability of resources is one of them. The major resources like manpower are missing because of degrading economy and brain drain is happening and the resources are going outside. The recession also impacted the economy of Limerick because various foreign investors stopped and went back to another country from Limerick and due to this the job opportunities got reduced and the people get unemployed. Considering the infrastructure facilities like business centres, roads etc. Limerick is showing very high quality and standard but coming to digital infrastructure the condition is very poor. In the coming years and the present condition broadband connections, internet facilities etc. are the game changers in economics sector due to the lack of quality digital infrastructure also makes a bad impression in the investors to invest in the Limerick city. There are so many educational institutions having high potential is there, but their underperformance is also affecting the economy.

The three main factors affecting the economy in Limerick is education, FDI investment and business growth. Education levels across the Limerick Metropolitan Area are average. At Metropolitan Area level 29.6% of the population qualified to a higher certificate or higher qualification and 25.2% have a degree or higher qualification. Even though many institutes are there less percentage of people is having a proper education. One of the main job providing sector is FDI but only 1% of FDI investments are there in Limerick when comparing Ireland economy. Considering the growth of business, the environment and facilities of future growth are less. One of the main things is internet facility. The lack of digital infrastructure makes the investors remove Limerick from their list.

The Economic Strategy sets the direction for the economy of Limerick and determines the ambition and the key objectives around scale, structure and value of the economy. So, the strategies are made considering the knowledge economy (educational institutions), outstanding business environment (providing adequate support to start-ups, incentives to businessmen which increases job opportunities) and long-term growth regarding digital infrastructure and free internet (Table 1.31).

The economic strategy of Limerick is concentrating the three weak sections in their economy and the strategies are well enough to up bring the positives and suppress the shortcomings. These strategies are making the educational institutions

Table 1.31 Spatial strategies-Limerick

Strategy	Rationale	Partnership and fund
Promote quality education through high-quality teachers Provide better and barrier-free facilities for education Promote lively and safe atmosphere	To promote high-quality education thereby economy	University of Limerick Limerick institute of technology Mary Immaculate College Limerick city and county council
Placements for students, research scholars	Educational institutions alone cannot promote business Generate new demands with available institutions	The university of Limerick, Economic development and Planning Directorate, fund-200k/annum
– Utilise existing opportunities and enterprise Ireland partnership with private, attract more businesses – Formation of innovation	– To expand the existing lapsing economy – Securing finance was risky in old days – For R&D fewer revenues are available – Banks are unable to support innovation due to risk factor	Ireland enterprise, Private sector and SVC fund
Provide quality spaces for businesses and making available for all leases Provide shared services Provide access to range of Business experts through Limerick Business Portal Accelerating route to market by raising fund and reduce risk	– Availability of vibrant spaces all over the city – Availability of facilities like ICT	Limerick city and county councils, university, private companies – in lease terms
– Raising the facilities by utilising the connectivity – provide high-quality business space and park to promote businesses	– Requirement of well-connected urban knowledge Or tech park – Close proximity to business and city centre	Limerick city County and councils Private sector – €25–30 m
– Clustering of medical facilities – Providing specialised treatment – Strengthen life science, healthcare and public health through clustering	Availability of medical facilities	Limerick city County and councils Private sector
– Raising fund for start-ups through business network and venture capital	To catalyst more investment where it is low	Limerick city and council €1 m
– Promote high potential start-up through Business portal	– Availability of support from stakeholders for start-ups – To support start-ups	Private sector, enterprises Ireland – Funding according to budget

(continued)

Table 1.31 (continued)

Strategy	Rationale	Partnership and fund
– Support on marketing and workforce development (through incentives)		
– Promote business by making funding available easily to all sized companies	– Lack of interconnection between companies	IDA, Limerick city and county council – Funding according to budget
– Improving Broadband facilities with high speed to attract Multiple service providers, business etc.	– Availability of high economic connections – High tech business location needs high-speed broadband	Internet service providers, Limerick city and County Councils €10–15 m
–Provide Skill development through centres to unemployed people by local authorities – Improving skill of workforce in ICT, tourism etc. by through experts – Continuous monitoring of skill through educational institutions – Collaborate school and colleges for training	Availability of educational institutes which can act as monitoring centres and skill development centres – Increase in no of residents in the area Increase in level of generic skills of young people and adults (communication, teamwork) – The increase in educational standards of people	Vocal education trainers Training providers, City and county councils
– Promote local workforce – Give proper training to labours and assign work	– Availability of historical monument – Regeneration of the historical buildings can provide employment	Community sector Construction firms Employment training boards Limerick city and county councils

well enough to bring new economic activities and it uses the R&D section for researchers and innovative technologies which may bring positive effect. Then various supporting programmes and incentives to start-ups may encourage start-ups providing better infrastructure facilities by clustering the medical facilities will attract people and the draining out population can be controlled. Quality spaces for businesses is a need for every business by providing high-quality business space with the impression of the place among the businessmen will increase and competition rise among people to get space in Limerick. This may cause an increase in quality of businesses leads to economic growth. For the economic growth to happen and continue Limerick must concentrate the future also. ICT enabled skill development centres to make the unemployed people to get trained and employed people to increase their skill so that the efficiency increases and future workforce efficiency increases. This is done through academic institutes which are the potential of Limerick County. Since the institutes are monitoring this will become effective. Improving the leadership among the stakeholders make efficient management of workforce, broadband connection to improve the technology and to know the future

trends, improvement of airport creates more economic connections and interactions in future. Altogether the economic strategy is good enough to achieve the objectives or economic growth.

The city is having potentials like historic buildings at a nice site which can be turned into an economic generator when it is taken care off. The Gregorian quarter, opera site etc. are among them due to inefficient maintenance and management these buildings are depreciating and which are not improving the city. The second one is waterfront of the city, the Limerick city is having unique waterfront which is having the potential to become a tourist spot but the area is not well maintained. the economic strategy also is made spatially for economic development that is by providing high-quality sites for the economic generators like educational institutions and business centres (Table 1.32).

The spatial strategy is dealing with the position of educational institutions, tourism, recreational facilities, historical buildings, transportation and shopping destinations. The institutions are places in such a way that the facilities are available and transport are arranged in such a way that higher accessibility is there. Then only students will come and activities increases. Economic generators like parks, waterfronts, historic buildings are maintained and arranged in a good manner. Limerick implemented a connection between the parks and waterfront to attract tourists. The strategy is good enough to attract them and the potential is used very well. Similarly, the historic buildings are maintained. Limerick plan considered about the transport facility also they encouraged pedestrianisation of some streets connected to historic buildings for their conservation. These strategies are not ensuring that the City Centre fulfils its full economic potential by becoming a desirable place in which to 'do business'. Limerick only considering the sectors like tourism and recreation.

The Limerick city is a place where the economic activity is degrading due to various factors like recession, improper management of assets like tourist spots educational institutions etc. The people of the place are facing unemployment also. The investments from other countries decreased due to the recession were the reason. The strategies are made to overcome all these difficulties and to make the Limerick as a thriving economy better than any other surrounding Irish economies. The economic strategy they prepared had three divisions based on their weak points as well as potential but the spatial strategy is not a well prepared one. It does not take care of the start-ups and business people. It concentrated on the infrastructure like road and buildings with potential, also the quality of standard of living of people, the tourism and recreation will increase the economic activities but for long-term economic growth the facilities for the investors also to be taken care off.

1.12.17 Case Study-17—Tokyo [72–74]

The area under the Tokyo Metropolitan Government's (TMG) jurisdiction covers about 2000 km^2. Tokyo's population has been slowly but steadily growing. Tokyo

Table 1.32 Economic strategies-Limerick

Objectives	Spatial strategy	Implementation strategy
Improve economy through better education facilities	Attract young people to city centre by providing quality education and accommodation	High educational campus Limerick institute of technology and University of Limerick
Encourage and promote tourism	Utilise the heritage value and site value, convert that to mixed use by conserving some of the areas and others for commercial use	Through limerick culture centre and world-class waterfront
To increase recreational areas or improving existing recreational area	Improvement of park and connect waterfront to it	Interconnecting the park and waterfront
Increase economic activity in Gregorian centre	Attract people to Gregorian quarter through renovation of cultural heritage buildings	Utilise the heritage value keeping some portions as the same and converting others to mixed commercial use
Improve the transportation facilities and connectivity	– Improve Colbert station hub – Create integrated transport interchange with linked commercial development Including refurbished station building	Through community participation or using local workforce
To reposition the City Centre as the premier regional shopping destination	Enhance city centre retail offer	Convert the city centre to mixed use and increase the density Convert the informal markets to formal ones Open air street connecting the informal market and city centre
To make better quality living	Make some streets inaccessible to vehicles growth	Convert the highways to bicycle ways and pedestrian streets, reduce car parking Make streets more pedestrian friendly through lighting at junctions, signs etc.

is a Meta-City and ranks as the largest urban agglomeration in the world according to the UN. Tokyo contributes to about 40% of the national GDP. It stands as the 14th largest Gross Product in the ranking of national GDPs. Tokyo has been ranked as one of the most global cities in most international benchmarks on urban attractiveness for decades. In 2014 Tokyo is ranked as the fourth most global city, after New York, London and Paris. The market size, its economic dynamism and its highly qualified human capital make Tokyo a major business hub.

The TMG is one of the largest local governments in the world, as of 2014, it employed 165,425 members of staff, and the number is unlikely to decrease as the city prepares for the 2020 Olympic Games. Despite its size, the TMG is quite flexible and has initiated innovative measures to tackle environmental issues and promote sustainable development since the 1990s. The TMG is not the only

authority when it comes to the governance of Tokyo in the field of sustainability. Especially when it comes to the Olympic and Paralympic Games-related planning, it shares competencies with other institutions from local, national and international levels, from the public and private sectors alike. Some research institutes and universities also influence the policy-making process related to the urban development in perspective of the Games. Tokyo's Energy and Environment Situation Reforms have been conducted since 1995 and allowed for the entrance of new utilities, often called Power Producers and Suppliers (PPS). There is a total of 195 power generation facilities, most of which are hydroelectric generating facilities, with a few thermal power plants, Renewable Energy power plants, and non-functioning nuclear power plants. Tokyo also ranks as the 33rd largest emitter of CO_2 in the world, between Finland and Singapore. The TMG contributed to the national effort by delocalizing factories from the metropolitan areas and by launching policies targeting the transportation sector especially. In 1997 Japan agreed to the Kyoto protocol and to achieve a 25% cut in CO_2 emissions by 2020.

The Smart Energy City strategy is based on measures taken following the Fukushima disaster and the resulting failure of generation plants to supply Tokyo to the same level as before. The Program included lowering the brightness standard, shifting to LED and keeping appliances on energy saving mode, and it targeted large facilities, small and medium facilities, households and TMG buildings.

If Tokyo, which is to remain the world's largest mature meta-city even in 2025, can show the world a model case of rebuilding as a sustainable city. The 2020 Tokyo Olympics will provide the best opportunity for "city sales." Three measures for rebuilding Tokyo into a sustainable city are:

i. Limiting vehicle use in city centre
ii. Promotion of city-centre residency
iii. Promotion of urban greening.

In the areas of business as well, Japan's slow rate of internationalisation stands out. Among major countries, Japan is one of the countries that receive very little foreign direct investment. Given this situation, the Japanese government set up the "Follow-Up Program for Promoting Japan as an Asian Business Centre and Direct Investment into Japan" in June 2012 and "Japan Revitalization Strategy Japan is Back" in June 2013 with the goal of doubling the inward foreign direct investment stock. As of 2012, the total debt of the Japanese national and local governments reached 224% of GDP. This is an overwhelmingly high rate. Given this financial situation, relying on the issuance of government bonds to finance infrastructure investment must be avoided. If funding from private sources proves difficult, it would be possible to procure funds from the private-public partnership infrastructure fund (Private Finance Initiative Promotion Corporation of Japan), which was established in October 2013.

Major construction works are planned by 2020. This is a non-exhaustive list. Some of these works had been planned regardless of the awarding of the Olympic and Paralympic Games to Tokyo.

- Airport facilities
- District redevelopment
- Metro network
- Road network.

A smart community is a community of a certain scale in which various consumers participate and one which has created a new social system. The new social system, while utilising a distributed energy system, including renewable energy and cogeneration, comprehensively manages energy supply and demand of the distributed energy system through an energy management system using IT, storage battery and other technologies to optimise use of energy and incorporates life support services, including the provision of care for elderly people. As smart community demonstration projects are cited in the Strategic Energy Plan that was decided by the Cabinet in 2014.

Major Smart Community Projects:

1. The Yokohama Smart City Project (YSCP).
2. The Toyota City Low-carbon Society Verification Project (Smart Meat).

Japanese-developed smart community systems will be disseminated abroad in the future through economic diplomacy by government leaders, the provision of appropriate platforms and enhancement of governmental support tools.

Most foreign companies that enter the Japanese market do so through a Local Partner. There are three main ways to go about this:

- Indirect business with clients via agent
- Indirect business with clients via non-exclusive distributor
- Indirect business with clients via sole-representative.

When Tokyo speak to potential partners, one should be aware that it will be a two-way assessment: it is not only you who will be trying to assess suitability; they will be assessing you. Japan is a very competitive, sophisticated and information-oriented market. The right partner can make all the difference. But Japanese partners can be discerning and there may be a host of issues which prevent them from entering into a partnership which on the surface may look obvious for them as well as you.

News about smart city-related development in Japan: Some websites are in Japanese only. It is possible to use an online translating application (such as Google automatic translation) to read a Basic English translation. While such translation is useful for an introduction, it is necessary to rely on more professional translations for accurate market information.

Most events at the Olympic and Paralympic Games Tokyo 2020 will take place in two thematic and operational zones, with the Athletes' Village located at the intersection of the two zones. The Heritage Zone houses several legacy venues used at the 1964 Games including the Yoyogi National Gymnasium and the Nippon Budokan. The Bay Zone serves as a model for futuristic urban development and includes the Dream Island Park and the Shiokaze Park venues—favourite places for

Tokyo residents to relax and play. The third pillar of Olympic and Paralympic Games: sustainability. The Tokyo Organising Committee of the Olympic and Paralympic Games is working to ensure the broad sustainability of the Tokyo 2020 Games, including in environmental, social, and economic terms. As part of that effort, the Committee has made a commitment to making sustainability a consideration in the procurement process during preparations for, as well as the hosting of, the Games.

The Committee's Sustainable Sourcing Working Group, which has been studying how to give shape to the Sourcing Code since that announcement, has compiled a draft Sustainable Sourcing Code. In addition to setting forth standards and methods that will apply to all goods and services procured by the Committee, the Code defines individual codes for agricultural, livestock and fishery products that take account of sustainability. The Working Group is now seeking public comment on the draft for its future study.

- Effective utilisation of Games-related facilities.
- Implementation of Urban Planning to Ensure Secured and Comfortable Living for Everyone.
- Communicate the Importance of Sustainability through Efforts Triggered by the Games.

Olympic Environmental Impact Assessment, a measure based on the current Environmental Impact Assessment (EIA) will be established. The EIA is initiated before the project is fully launched, and is over only after the project is completed, to consider both estimated and actual impacts on the environment. A similar EIA is planned to be applied to Olympic venues.

Challenges to sustainable 2020 planning and implementation: All construction, directly and indirectly, related to the mega-event will degrade the environment as CO_2 emissions and construction waste production is very likely to increase, considering the recent surge in carbon dioxide emission because of the shift back to fossil fuels, and the enduring problem of waste treatment and illegal dumping.

While Japan remains a major market for green technology and solutions, it is a fact that it has known better times in terms of economic performance. A three-part strategy relying on monetary regime change—with a 2% inflation goal, a fiscal stimulus—with JPY ¥ 10.3 trillion injected into the economy, and a series of structural reforms aimed at boosting long-term growth known as Abenomics is facing criticism since its proposal by the prime minister of Japan. Recently the whole Abenomics concept has been questioned as Japanese household's income have not kept pace with the inflation and taxation.

Despite the severe attacks on the results of the Abenomics and other shortcomings of Japan's public finance, the current Japanese economy presents attractive opportunities for business and cooperation between Japanese and European companies in the smart city sector. A fast-growing segment of the smart city market in Japan is the smart house service sector.

Research and innovation in the TMA: Additionally, many research institutes and R&D centres are in the TMA. Tokyo is ranked as the second metropolis submitting patent applications, right after San Francisco, with 5138 applications. The sectors where most patients are delivered are transported impact mitigation, potential or indirect contribution to emissions mitigation and general environmental management.

Olympic and Paralympic Games market and impact on Japanese economy: As mentioned in the introduction, hosting the Olympic and Paralympic Games has both tremendous advantages and drawbacks; the large costs to the host city are rarely compensated by the revenues or the legacy of Olympic venues. Indeed, hosting a mega event does not cause an increase in trade by itself, but sends a global signal of policy intentions. Thus, even candidates which do not host the Games are also likely to be more open and to experience an increase in exports. Although there is no specific mention of a direct effect of the Olympic and Paralympic Games on Japan's green economy in estimates so far, the market for smart technology has swelled since September 2013. The mega-event has significant potential in its educational value; in the case of Tokyo, the 2020 Olympics are the opportunity for increasing existing awareness about renewable energy, energy saving and waste management as is stated in the Games Foundation Plan.

While the real estate prices for sale and rental are already rising in Toyosu where the Olympic Village will be built, all wards where most of the Olympic venues are located can be expected to have higher land prices by 2020, making central Tokyo less and less attractive for renting, keeping or buying an office in Tokyo.

The electricity market reform was approved in 2013, and the first phase started from April 2015, with the establishment of the Organisation for Cross Regional Cooperation of Transmission Operators (OCTO). The OCTO has two functions: "to aggregate and analysed the supply-demand plans and grid plans, and order to change plans such as tie lines construction; and to order to reinforce generations and power interchanges under a tight supply-demand situation". In addition, they are not the most cooperative players on the market. They are very conservative companies with regional monopolies, which the reform intends to remove.

This section first highlights a few sectors which development is supported by Japan's Cabinet Office and looks at a few other sectors with market potential for European companies. Besides energy efficiency related business, a wide range of sectors in the smart city is considered, such as IT contributing to a more connected city. The opportunities may be directly linked to the Olympic and Paralympic Games operation, for example, the smart hospitality sector. Other opportunities may not be directly related to the Olympic and Paralympic Games, but are linked to the acceleration of green initiatives in Tokyo by 2020, as it is the case for the demand side management sector. The Cabinet Office defined this month 9 areas of Science and Technology Innovation to develop in perspective of the Games

• energy • next generation urban mobility • big data and sensors • weather forecast • smart hospitality • health monitoring • accessibility for handicapped individuals • audiovisual technology • green and flower arrangement.

Barriers and obstacles to business:
Complexity of networks and business practices in Tokyo is

- Difficulty in identifying the decision maker
- Lack of transparency from government agencies offering support
- Tendering process in Japanese
- Complexity of business practices.

Competitiveness of the market:

- Competition with Japanese and US companies
- Competition with "Olympic" companies.

The competition with companies and organisations from the UK involved in the 2012 Olympic and Paralympic Games is tough. The Tokyo 2020 Committee and the TMG are not only looking closely at the plans for the London Games but are very active in concluding agreements. Although there is no specific agreement between the UK and Japan about sustainability or smart urban development, it is possible that the Japanese Authorities would look more closely at the London case more than other cities.

The smart city strategy in Tokyo, the "Smart Energy City", was launched in May 2012 and builds on the emergency measures of energy savings which were enforced following the Fukushima accident in March 2011. Tokyo has further developed as a smart city through the promotion of renewable energy sources and smart meters in the central wards and the larger metropolitan area, along with several smart community initiatives. The Tokyo Metropolitan Government's (TMG) Bureau of Environment is very active in promoting energy efficiency and has achieved a 15% cut in CO_2 emissions in the industrial sector for instance. Despite such measures though, energy efficiency and carbon dioxide emission targets may be difficult to achieve by 2020.

The TMG is cooperating with the Tokyo Organising Committee of the Olympic and Paralympic Games (Tokyo 2020 Committee) to build on the existing green policies of the TMG and elaborate a concrete strategy for sustainable Games preparation and operation. Several obstacles can slow down enterprises' market access in Japan. The complexity of Japanese regulations and the lack of transparency of business practices can be challenging in some sectors for new companies which are unfamiliar with the language and the business culture. While 2020 is a catalyst and deadline for projects that are approved by the central and local government, it does not slow down the development of other smart community projects elsewhere in Japan.

1.13 Conclusion

This chapter is an introduction to international research studies of 16 smart metropolises of the book. The emerging scenario of metropolises, mega cities and meta-cities temporally and spatially across the world based on UN statistics and

projection is discussed. GDP creation of nations is taking place very actively mostly in these three types of cities across the world which are projected for 205. Spatially and economically, higher population and GDP growth rate in these cities is now evident and happening mostly in the eastern and southern hemisphere than in the west. This book concentrates on more number of studies from the east and south than the west. City society through their legal framework of constitution brings about the creativity of design of an economic and spatial strategy to take these cities to the next level facing all local challenges through their official Master Plans. The design of economic and spatial strategies is presented for 17 cities based on official plans. Not all these cities give equal importance to economic strategies in contrast to spatial strategies. Often there are plans with less attention to strategies in general and economic strategies. Some of them do not mention economic strategies at all. Metropolitan Planning and implementation should move from geographical space to community and then to prosumer households both for planning and implementation, but this is happening only in a few cities presented in this chapter in a very limited way. These plans shall be considered as a design for societal change and should not be just for bringing out the infrastructure provision required for the bureaucracy to implement. What is happening is also not satisfactory. There is no possibility for a generalised design of spatial and economic strategies for metropolises since each city is unique and mobilising communities for the design is the only way through E-Democracy [18] with intensive use of ICT by society and continuing online training for metropolitan development by every household.

1. This first chapter explores large cities of one million and above with special references to the design of economic and spatial strategies of the smart metropolitan region. With such concentration of people in the limited area these cities have an important role in economic development of the nation. Further bigger the size of the city in population and area the spatial issues are more complex and challenging. Although Master Plan is expected to sort out these issues, the author would like to explore how far it is achieved in a study of 17 metropolises around the world.
2. Metropolitan cities are continuously exposed to external economic changes and require medium term strategies say 5 year to face it. These economic strategies of cities call for differing spatial strategies to intervene in emerging global situation.
3. There has been an attempt to convert many metropolitan cities, largely using selective investment strategies and procedural administrative rules arbitrarily not sanctioned constitution in a limited part of cities with no economic and spatial rationale to smart cities world over. In many smart metropolitan city projects, only a part of the city has been taken up for the smart metropolitan city program and in many cases, it is status and elitist area of cities like New Delhi Municipals Committee area in Delhi and not where low-income people live under 100 smart cities project of India. What is required is to take the whole metropolis to convert it to smart metropolis using smart economic and spatial strategies in many steps and in many years. Designing economic and spatial

strategies for Smart Metropolitan Regional Development shall be conducted by the spatially identifiable economic community at micro levels from time to time to suit the ever-changing scenarios of the economic environment.

4. If a city also performs an important commercial, cultural and political function for its region or even the whole country can be called a metropolis. Such a major importance can usually be assumed for cities boasting some 500,000 inhabitants in Europe and one million plus in India. On the other hand, Global cities are those selected few metropolises whose political, cultural and commercial influence extends across the entire globe (e.g. New York City, Tokyo or London).
5. As social spaces, metropolitan areas or regions can be characterised by the following four dimensions: Metropolitan regions are defined as an accumulation of specialised metropolitan facilities including public and private services. In terms of actors and actions, metropolitan regions constitute an arena for key regional stakeholders to exchange knowledge on joint regional objectives, strategies and projects, as well as on the necessary organisational structures. In the context of spatial development, metropolitan regions are a normative and guiding concept intended to contribute to innovation, creativity and economic growth. About the symbolic dimension of urban and regional development, metropolitan regions are the medium of symbols, norms and values which convey aspects associated with the specific brand image of metropolis and urbanity.
6. Authors of the book "Geographic Information System for Smart Cities" Edited by T. M. Vinod Kumar examined several definitions of smart cities and were not satisfied and came out with their own definition. "The smart metropolitan (area/region) city is a knowledge-based city that develops extraordinary capabilities to be self-aware, functions 24 h and 7 days a week, communicate, selectively, knowledge in real time to citizen end users for a satisfactory way of life, with easy public delivery of services, comfortable mobility, conservation of energy, environment and other natural resources, and creates energetic face to face communities and a vibrant urban economy even at time of national economic downturns". All six components of smart cities such as Smart Economy, Smart People, Smart Governance, Smart Mobility, Smart Environment and Smart Living is implied in this definition has been presented in detail in the four books of this series by the Author.
7. The concept global economy with partnership and division of labour of global network of cities is not new, but those who talk about a globalised economy insist that there have been distinct changes in its structure and modes of production. Whereas earlier economic activities crossed national boundaries, globalisation includes a deeper integration, where transnational corporations orchestrate production from various locations. Global places indicate a rising of networked society globally which can work effectively in a smart metropolis with high endowments of ICT and IOT.

8. The Global Urbanisation has five basic elements namely, new innovative technology, the centrality of information made possible by instant communication, an increasing trend toward the standardisation of economic and social products, growing cross-national integration, and mutual vulnerability stemming from greater interdependence.
9. UNHABITAT defined the metro cities as 1 million plus agglomeration 'mega-city' as with 10 million plus population and 'Meta city' which describes 'massive conurbations of more than 20 million people or above'. Since ICT drives the mega city and meta city formation, these cities are smart cities in making.
10. In 2016, there were 512 cities with at least 1 million inhabitants (metropolitan region/cities) globally. By 2030, a projected 662 cities will have at least 1 million residents. As hubs of trade, culture, information and industry, they will be vested with such power that at many levels they will act as city states that are independent of national and regional mediation. Today mega cities are home to less than 10% of the global urban population. In 2016, there were 31 megacities globally and their number is projected to rise to 41 by 2030.
11. There were eight meta cities above 20 million in 2016 in the universe, which is likely to be twice about 15–16 in number or little less in 2030 which may be considered as the accelerated graduation of mega cities to meta cities. However, the number of mega cities increase during this period which includes meta cities were from 31 to 41 which is not as impressive as that of the meta-cities.
12. Meta cities and Megacities are a key to globalisation, a state of interconnectedness around the globe that transcends and largely ignores national boundaries. Global urban economies rely on advanced producer services such as finance, banking, insurance, law, management consultancy, advertising and other services. The technology revolution has made it possible for business enterprises to hire these services anywhere in the world.
13. If mega cities including meta cities represent the economic hub of the future it is shifting towards Asia from America and Europe. Integrated spatial and economic strategies can help this transition. As per the current trend GDP growth rate in Asia is much higher than Europe and Americas and it is likely to continue for few decades. It looks like an Asian and African era is emerging. Growth rates of many mega cities in Asia and some in Africa are growing at higher rate than elsewhere.
14. When compared to China, India and the US; the largest urban population is in China followed by India and US. The total urban population in India is higher than the US. The percent of the urban population in mega cities in India are more than US and China in that order. China has all its metro and mega cities in the East facing the sea leaving a vast stretch in the western area without mega, meta and metro cities. China is fast moving towards a one billion urban population. Among the urban population, the largest percent people in India live in megacities which are more than 10 million population. In Kerala state, India 76% of the urban population lives in million plus cities, followed by Maharashtra state (59%), and Gujarat (55%). The lowest percentage of people

in India living in one million cities and above are Haryana (16%) and Bihar (17%). The largest number of million plus cities are in Kerala (7), and Uttar Pradesh (7) followed by Maharashtra (6) and Gujarat (4). The lowest number of one million plus cities are in Haryana and Bihar with one each.

15. There are already networks and corridors cutting across the boundary of nations which has given rise to the formation of urban settlements in 2016 in a globalised world.
16. Often the share of GDP produced in this mega and meta-city are considerable in comparison to total National GDP.
17. The projected GDP 2025 of top 30 Urban Agglomeration was used with projected population computed by UNHABITAT to derive average real GDP/population growth rate projected during 2008–2025. This shows that GDP/population growth rates of largest 30 urban economies in the universe are generally low but there are few exceptions in the south and eastern urban agglomeration.
18. Tabulating under descending order of high GDP growth rate of first 30 urban agglomerations by GDP growth rate 2008-25 and then cities are organised by countries and found that these urban agglomerations are all in Asia and Africa. It can be seen the higher GDP performance cities are in large number in India followed by China and other countries. This justifies a maximum number of case studies in this book from Asia and Africa.
19. There is a division of labour across city regions transcending country boundaries sharing the economic responsibilities as per capabilities. Global urban economies rely on advanced and standardised producer services such as finance, banking, insurance, logistics, law, management consultancy, advertising and other services. The technology revolution and uniformity of standard practices have made it possible for business enterprises to hire these services anywhere in the world. The national hierarchy of cities and the spatial division of labour within the economy is superimposed by a global division of labour. Cities and metropolitan regions become part of an emerging international hierarchy based on a competitive division of labour at the global level by international connections that affect financial flows and the knowledge-intensive service sector.
20. Large cities are interconnected and influence global and reinforce spatial interdependent functional structure with appropriate linkages. The connection is twofold within its city region and outside the city region transcending other national boundaries. The city is connected to hinterland and outside world simultaneously in a metropolitan region.
21. World cities are characterised by a sum of political power (both national and international) and organisations related to government; national and international trade, whereby cities function as gateway for their own and sometimes also neighbouring countries; providing superior banking, insurance and related financial services; advanced professional activities of all kinds; information gathering and diffusion. The form and extent of a city's integration with the world economy and the functions assigned to the city in the new spatial division of labour will be decisive for any structural changes occurring within it.

22. The world cities exhibit the following;
    i. The nature of a city's integration with the world economy is decisive for any structural changes occurring within it.
    ii. Key cities throughout the world are used by global capital as 'basing points' for the organisation of production and markets.
    iii. The global control functions of world cities are manifest in the structure of their industrial structure and job markets.
    iv. World cities are major sites for the concentration and accumulation of capital.
    v. World cities are destinations for large numbers of migrants—both domestic and international.
    vi. World city formation exposes the major contradictions of industrial capitalism, particularly spatial class polarisation.
23. There are two trends of thoughts about Meta cities, Megacities, and metro cities. One tries to attain a position of the global city by deliberately executing spatial and economic strategies to achieve that goal following what is discussed in the earlier paragraphs. This is in addition to solving many city specific issues of metropolitan development. The second approach is how to make a metropolitan area a smart metropolis by appropriate spatial and economic strategies. Smart is ICT implementation in all activities including economic activities. Economic strategies may involve converting the region with all its economic activities to the smart economy as discussed in the book in this book series "Smart Economy in Smart Cities".
    1. Since this book focuses on the area of design of economic and spatial strategies to achieve the overall goals of smart metropolitan development. A survey, of such designs of several official plans is undertaken here. Cities are selected randomly with no sampling plans. The following discusses only the appraisal of these economic and spatial strategies in several metropolises.
        i. **Delhi NCR Metropolitan Region**. Although Delhi will be the second largest meta city in the world in 2030 after Tokyo and therefore is a global city. There is no such consideration in the NCR Plan. Also, there is no deliberate promotion of the city to a smart metropolitan city with appropriate ICT-IOT design and related spatial strategies. The economic strategy adopted by the NCR planning board is not efficient enough for a city such as Delhi. The stated Delhi strategy of making trade and commerce barrier free which is the aim of Goods and Service Act 2017 nationwide within NCR will not suffice for Delhi. Other specific issues mainly administrative issues are not addressed for further easing to do business and giving impetus for the development of industries. Interstate agreement on unified policies can create chaos and may reach a long time to reach consensus. This might be a hindrance to further development of NCR

region. Increased ease of doing business, transparent laws and regulations for the same have not been given due consideration. Also, focus on people and skill development for economic development is not visible. Smart mobility based spatial strategy is not stated.

ii. **Vancouver Metropolitan Region**. In the case of Vancouver, there is a strong economic strategy in place. Local businesses and talents are nurtured which results in a booming diverse economy. Brain–drain is prevented by attracting foreign Canadians and immigrants with attractive and affordable housing and environment for families. This is a strategy to attract a skilled workforce. Integration of universities with business centres for productive R&D yet another important step in economic growth. They have thoroughly invested in the clustered growth of industries with an increased focus on green jobs to remain sustainable in the long run.

iii. **Melbourne 2030**. Planning for Sustainable Growth. Plan Melbourne does not identify how the government will respond to the impacts of climate change. The Metropolitan Planning Authority must work in close partnership with Local Government, in the future planning for Urban Renewal Areas. Initiatives to 'streamline' the planning system which limits community involvement in the planning process, or reduces Local Government's decision-making responsibilities, are not supported.

iv. **Shanghai Metropolitan Plan**. Shanghai is now facing great opportunities in turning itself into an international economic, financial, and trade centre. China's continuous economic growth provides a solid base for Shanghai to move toward this goal. Shanghai has set its long-term strategic objectives for social and economic development. By 2010, Shanghai is planned to become one of the international economic, financial and trade centres of the world. Shanghai aims to form the economic scale and comprehensive strength of a world metropolis; optimise urban spatial distribution, modernise the city's physical infrastructure, participate in international labour division and the circular flow of the international economy, introduce the operational mechanism of a socialist market economy, and pursue the balanced social, economic and environmental development. Economic Strategies plan is to optimise and upgrade the industrial structure, trying to improve the pivotal status of Shanghai in global city network and process to accelerate the technological innovation.

v. **Mumbai Metropolitan Regional Development**. The Economic strategy given by the metropolitan plan is very broad. Mumbai Metropolitan Regional Plan 2016-36 mainly addressed issues of growing urbanisation, uneven distribution of jobs increasing commutes, lack of affordable housing and basic infrastructure in the region, environmental degradation and inadequate governance. The existing situation of Mumbai Metropolitan Region is analysed

sectoral and cross-sectoral to arrive at issues that need to be addressed in the Regional Plan 2016-36.

vi. **New York**. The economic strategy adopted clearly touches every aspect of the economy. The plan also emphasised on strengthening the fundamentals such as workforce which is very important in achieving economic development. The New York Metropolitan Region has a separate spatial plan, transportation plan and economic development plan. The strategies adopted clearly ensure sustainable and long-term growth in jobs and income to contribute to the resurgence of the broader economy of New York State. Also, they have a detailed transportation development plan which has a shared vision for sustainability.

vii. **Calgary Metropolitan Region**. The Calgary Regional Partnership (CRP) and member municipalities will work together to ensure a diversified and globally competitive region that continues to enjoy a high quality of life and is able to attract and retain a viable and adequate regional workforce and member municipalities will endeavour to achieve a distribution of jobs creation and economic activities throughout the region consistent with transit and complete mobility policies that encourage the location of jobs close to where people live. Recognising the connections and relationships that exist between communities, the Calgary Metropolitan Plan (CMP) acknowledges and respects the vital and historic importance of rural lands, industry and culture in our region. What are the industries and where those can be established to boost the economy and employment is not stated? What are the land management techniques suitable in this region are not mentioned? There is a lot of potentials to develop tourism which is not at all described. They mentioned that various studies need to be done to analyse the economic boost but what are those not stated. The Calgary Metropolitan Plan is the blueprint for accommodating growth in future. The plan giving the various strategies to make Calgary as a healthy environment in enriched communities, with sustainable infrastructure and a prosperous economy.

viii. **Kuala Lumpur Metropolitan Regional Development Plan**. The vision and goals for Kuala Lumpur have been formulated with the aim of creating a sustainable city. City Hall Kuala Lumpur (CHKL) shall ensure that the planning of the City shall strike a balance between physical, economic, social and environmental development. Local Agenda 21 shall be adopted to encourage citizen participation towards creating a sustainable society. This is in line with government policies of implementing sustainable development strategies as stipulated in the Habitat Agenda of the Rio Declaration.

ix. **London Metropolis**. The London Plan sets out a new approach for planning in London. It emphasises growing inward and upward so that it can reduce the costs of growth, create walkable communities, revitalise our urban neighbourhoods and business areas, protect our farmlands, and reduce greenhouse gases and energy consumption. The plan sets out to conserve our cultural heritage and protect our environmental areas, hazard lands, and natural resources. Through the London Plan, the community is planning for vibrant, healthy, safe and fulfilling neighbourhoods, attractive and viable mobility alternatives and affordable housing that is accessible to those who need it. At the root of The London Plan is the goal of building a city that will be attractive as a place to live and invest in a highly competitive world and one that will offer the opportunity of prosperity to everyone—one their own terms and in their own way.

x. **Berlin Plan 2035**. The Berlin Strategy provides an inter-agency model for the long-term, sustainable development of the capital. With one-third of the city comprising of open spaces, a compact polycentric development, highly tolerant society, the development plan further proposes to enhance these key selling points of Berlin. The development plan builds its foundation on the strong points of Berlin and proposes strategies to tackle the challenges. Provisions of affordable housing, further increasing the short distances to amenities, enabling a start-up friendly environment are some of the key proposals of the plan. Cultural diversity and tolerance in the society are used as a selling point for the attraction of workforce and tourists. Community participation is given utmost importance. The economy focuses on the educational institutions, research centres, attracts skilled labour from all over the world. Using a range of strategies and goals, it sets out the areas and directions in which this growing city should develop and highlights the areas that will form the focus of its future development.

xi. **Dhaka Structure Plan 2016–2035**. The Dhaka structure plan covers the basic issues such as effective land use management, transport for efficient connectivity, enhancing employment and productivity, public Facilities, protecting the natural and healthy environment. The spatial concept of dividing the planning area into two broad categories i.e. Urban Promotion Area (UPA) and Urban Control Area (UCA) is an efficient way to assure uniform distribution of development. Here, the basic requirements are made available at each functional region reducing the dependency on the core city. At the same time under the UCA flood flow zones, Water Retention Area, National and Regional parks, Forest Area, and large-scale Heritage sites are preserved. Instead of focussing on individual plot based development, the concept of planned unit development is introduced. The plan talks about increasing the productivity of the informal

sector, which is a good step towards mitigating urban poverty. The garment sector, leather manufacturing which boosts women employment is also planned to make it more efficient. While the report covers all the broad aspects required for the development of a region, the involvement of the public in the planning process would provide a more achievable and efficient plan.

xii. **Master Plan for Patna Metropolitan Region**. The Metropolitan plan for Patna, though it takes into consideration, the Economic aspect of the city, doesn't provide a sufficient Economic Strategy for development. The plan has a concept for the spatial development of the city. The spatial strategy is fairly achieved. The Implementation plan simply explains a case study for TP schemes from Ahmedabad. There is no strategy adopted. Also, it doesn't consider each project in detail. The Economic approach in the Master Plan is only by addressing the land requirement for various employments generated. There is no mention about Economic Strategy. Patna being the only important city in the state has acquired the strong position in regional trade and business. It is necessary to have an economic strategy while planning for Patna. The Master plan lacks this. Instead, an overall development which also leads to economic development is attempted. Implementation plan doesn't consider every project in detail.

xiii. **Montreal Metropolitan Development Plan 2020**. Economic strengths are utilised and creative market and the smart economy are aimed to achieve through these strategies. A clear and comprehensive economic strategy is provided in the Master plan. The implementation strategy to carry out each strategy is also explained. The idea of Smart Metropolis is carefully dealt here which is considered as the most innovative and sustainable development concept in the current scenario. Montreal is a large city with a diversified economy needed a spatial and economic strategy which is formulated and explained well in the Master plan. Issues and potentials were identified and addressed carefully.

xiv. **Helsinki**. The spatial structure for the economic/business development is mentioned. But the kind of economic activities is not clear even though the zones are marked. The spatial zoning of economic activities is done such a way that it is around the city centre and large-scale industries are placed away from the centre which has easy access from nearby places. Retail activities are evenly distributed in all area.

xv. **Istanbul 2014–2023**. The economic strategy discusses all the sectors to make a globally decisive, high value added, innovative and creative economy. The focus has been given to entrepreneurship to encourage the work participation thereby eliminating unemployment that would lead to a better vibrant economy. The main idea of entrepreneurship is to be appreciated as the city will sustain its own

economy rather than depending on external revenue as in trade. Even though the strategies and objectives are discussed elaborately the implementation is not detailed which makes it difficult for the region to put these concepts into reality. The Metropolitan Plan discusses a vision for Istanbul, spatial and economic strategy. The very important part was the public participatory approach so that the people of the place make the place. All the strategical domains are made with the opinions of the citizens and thereby solve their issues and each project is for the development of the city and the citizens. The economic domains include the transformation of the industry, ascending R&D, encouraging entrepreneurship, and increasing employment. All these directly or indirectly stand for the citizens. The spatial domains are increasing spatial quality, holistic urban transformation, protecting the culture and history, effective disaster management, sustainable transport.

xvi. **Limerick**. The Limerick city is a place where the economic activity is degrading due to various factors like recession, improper management of assets like tourist spots educational institutions etc. The people of the place are facing unemployment also. The investments from other countries decreased due to the recession. The strategies are made to overcome all these difficulties and to make the Limerick as a thriving economy better than any other surrounding Irish economies. The economic strategy they prepared had three divisions based on their weak points as well as potential but the spatial strategy is not a well prepared one. It does not take care of the start-ups and business people. It concentrated on the infrastructure like road and buildings with potential, also the quality of standard of living of people, the tourism and recreation will increase the economic activities but for long-term economic growth the facilities for the investors also to be taken care of.

xvii. **Tokyo**. The smart metropolitan city strategy in Tokyo, the "Smart Energy City", was launched in May 2012 and builds on the emergency measures of energy savings which were enforced following the Fukushima accident in March 2011. Tokyo has further developed as a smart metropolitan city through the promotion of renewable energy sources and smart meters in the central wards and the larger metropolitan area, along with several smart community initiatives. The Tokyo Metropolitan Government's (TMG) Bureau of Environment is very active in promoting energy efficiency and has achieved a 15% cut in CO_2 emissions in the industrial sector for instance. Despite such measures though, energy efficiency and carbon dioxide emission targets may be difficult to achieve by 2020. The TMG is cooperating with the Tokyo Organising Committee of the Olympic and Paralympic Games (Tokyo 2020 Committee) to build on the existing green policies of the TMG and elaborate a

concrete strategy for sustainable Games preparation and operation. Several obstacles can slow down enterprises' market access in Japan. The complexity of Japanese regulations and the lack of transparency of business practices can be challenging in some sectors for new companies which are unfamiliar with the language and the business culture. While 2020 is a catalyst and deadline for projects that are approved by the central and local government, it does not slow down the development of other smart community projects elsewhere in Japan.

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