Patterns of urbanization and urban development in West Bengal

Sriparna Das* and Bimal K. Kar, Guwahati

Abstract

Globally the phenomenon of urbanization has undergone a rapid change at the onset of the twenty first century. As a matter of fact, the growth of urbanization in contemporary period has unprecedentedly shifted from the developed world to the developing world including India. So far, the level of urbanization in West Bengal is concerned, although it is almost the same (31.89 percent) with that of national average (31.20 percent) as per 2011 Census, the pattern of urbanization in West Bengal is altogether very complex. Here, the whole process of urbanization and urban development is by and large centred around Kolkata metropolitan region. Spatially also, the pattern of urbanization across the state is highly unbalanced. However, the last decade (2001-2011) that witnessed marked increase of small towns with population below 20,000 has resulted in considerably higher growth rate of population in such towns as compared to the large towns and cities. With this background, an attempt is made in this paper to investigate the spatio-temporal patterns of urbanization in West Bengal based on secondary data obtained from various Census of India volumes for the period 1901-2011. The data so obtained have been meaningfully analysed and graphically presented by applying suitable statistical and cartographic techniques.

Keywords: *Urbanization, urbanization level, growth rate, urban concentration, census town.*

Introduction

Urbanization is a process that brings about marked spatial concentration of population in selected areas along with transformation of the economy from agricultural to non-agricultural one. The world is urbanizing fast with 55 percent of its population now residing in urban areas. This proportion is expected to reach 68 percent by the year 2050 (UN-DESA, 2019). This global picture however marks substantial differences in the level of urbanization between the developed (79.1%) and the developing countries (51.7%) (UNHSP, 2020). The urbanization level in some of the developed countries like Belgium, Netherland, Japan, Jordan,

Denmark, New Zealand, Australia, Canada, U.S.A., U.K., etc has even crossed 80 percent, and as such its growth has reached a plateau character (World Bank, 2021). In the case of some of the developing countries like China, Thailand, Nigeria and Namibia, although the urbanization level remained around 30 percent in 2000, it has crossed 50 percent due to its faster growth in recent times (World Bank, 2021). Although the process of urbanization in India has remained very slow until recent times, it has a long history of urbanization which started since the 'Indus Valley Civilization' dating back to 2350 BC. In fact, the process of urbanization in

modern sense began in the country along with industrialization mainly after Independence. Strikingly, the level of urbanization according to 2011 Census has increased faster than expected and also for the first time since Independence the absolute increase in the urban population was higher than that in the rural population (Bhagat, 2011).

So far growth of urban population in India is concerned; it has been quite high during 2001-2011 (2.80 percent) as compared to its rural counterpart (1.17%). However, due to slow and steady pace of urban growth, the level of urbanization in West Bengal has experienced marginal increase (from 23.88 to 31.89%) during 1951-2011 as compared to the country as a whole (from 17.21 to 31.20%), and as a consequence, the differential in urbanization level between the nation and West Bengal has declined from 6.59 to 0.69 percent. Industrial stagnation combined with considerably high population growth since the Independence was mainly responsible for sluggish urbanisation in the state, which has however started changing in recent years due to emergence of large number of smaller towns surrounding Kolkata metropolis and other parts of the state (Giri, 1998). Significantly, although the city of Kolkata is growing steadily in terms of its population during 1981-2011, its share to the state's total urban population has been on gradual decline (from 63.63 to 48.32%) due to the emergence of many small towns (from 68 in 1971 to 534 in 2011) with less than 10,000 populations each (Chakraborty *et al.*, 2015; Guin, 2016). Experts opine that these changes are the result of new economic policies introduced in 1991, while the unprecedented emergence of new urban centres was guided by the increase in male non-farm workers in large villages (Guin

and Das, 2015a; Mitra and Kumar, 2015; Guin, 2016). According to 2011 Census, with 526 small towns, West Bengal has maximum number of census towns [1] among the states of India and most of these belong to class IV (10,000-19,999), class V (5,000-9,999) and class VI (Below 5,000) categories with the population of less than 20,000. Significantly, studies reveal that more than 60 percent of these newly emerged small urban centres are located farther away from the cities (Pradhan, 2013; Guin, 2016). It is in this context that the state of West Bengal is selected as a case for understanding the patterns of urbanization and urban development. The paper analyses the trend of urbanization in the state in general and examines the spatio-temporal patterns in the level of urbanization and urban development in particular.

Database and methodology

The study is primarily based on data obtained from different volumes of Census of India for the period 1901-2011 in general and 1971-2011 in particular. The data pertaining to birth rate and death rate to compute components of urban population growth have been obtained from Sample Registration System Bulletin of Government of West Bengal. Information pertaining to the size-class distribution of urban centres, rank-size relationship analysis and primacy of urban system have been collected from Census of India for the period 1971-2011.To understand the spatio-temporal patterns of urbanization, level of urbanization, growth rate of urban population and components of urban population growth have been analysed. To show the degree of spatial inequality or concentration in urban population distribution, Lorenz Curve and Gini's Coefficient, Size-class distribution of urban centres, rank-size relationship of urban

centres and urban primacy index have been calculated. The spatial variation has been understood at the state level in relation to the nation, regional level and lower aggregate level of the districts. The distribution of all the urban centres in the state has been presented in a map based on their locations obtained with the help of Google Earth. The level of urban development at regional/district level has been computed by applying composite Z-score using the indicators like level of urbanization, urban literacy rate, proportion of 0-6 urban population, proportion of urban non-agricultural workers, proportion of urban literates with education of graduation and above, and the proportion of urban households with amenities like LPG for cooking, electricity, water supply, sanitation, permanent house, etc. While computing composite Z-scores, the nature of indicators with respect to urban development (positive or negative) has also been taken into consideration so that they are all compatible to one another. As proportion of 0-6 population indicates prevailing fertility rate in any area or population, it is included as one of the demographic indicators for finding out the level of urban development. Maps and diagrams are prepared by using Arc GIS and MS Excel.

The study area

The state of West Bengal, located in the eastern part of India between 21°20'N to 27°32'N latitudes and 85°50'E to 89°52'E longitudes, constitutes the study area (Fig. 1). It extends from the foot of Darjeeling Himalayas in the north to the Bay of Bengal in the south, part of Chhotanagpur plateau in the west and lower Ganga plain in the east. The state has an area of 88,752 km^2 accounting for 2.7 percent of the country's total land and a population of 91.3 million as per 2011 Census (7.54% of country's total). The density of population as per 2011 Census (1,028 persons/km^2) is significantly higher than the country's average (382 persons/km^2). Administratively, it consists of 19 districts which are distributed in five geographical regions, viz. (i) Mountainous region (Darjeeling district), (ii) Northern Plain region (Jalpaiguri, Koch Bihar, Uttar Dinajpur, Dakshin Dinajpur and Maldah districts), (iii) Southern Plain region (Murshidabad, Birbhum, Barddhaman, Nadia, Hooghly, Howrah, North 24 Parganas and Kolkata districts), (iv) Plateau region (Purulia, Bankura and Paschim Medinipur districts) and (v) Coastal Plain region (South 24 Parganas and Purba Medinipur districts) (NATMO Map, 2010). The state has experienced slightly lower growth rate of urban population (2.64%) as compared to national average (2.80%) during 2001-2011.

Analysis and discussion

Trends in urban population growth

The urban population of West Bengal at the beginning of the twentieth century which constituted 12.19 percent of the state's total population was only 2 million (As per 1901 Census). It increased to 29 million in 2011-about 15 times during 1901-2011 and urbanization level of 31.89 percent in 2011. Although the growth rate of urban population in the state has been considerably slow during early part of the twentieth century largely due to the occurrence of natural calamities, plague, etc., it witnessed marked increase in the rate post 1931 (Table 1) due to expansion of industrial activity and influx of people from rural areas of the state and other parts of the country including then East Bengal (presently Bangladesh), Nepal and Bihar (Crook and Dyson, 1981; Bhagat and Mohanty, 2009).
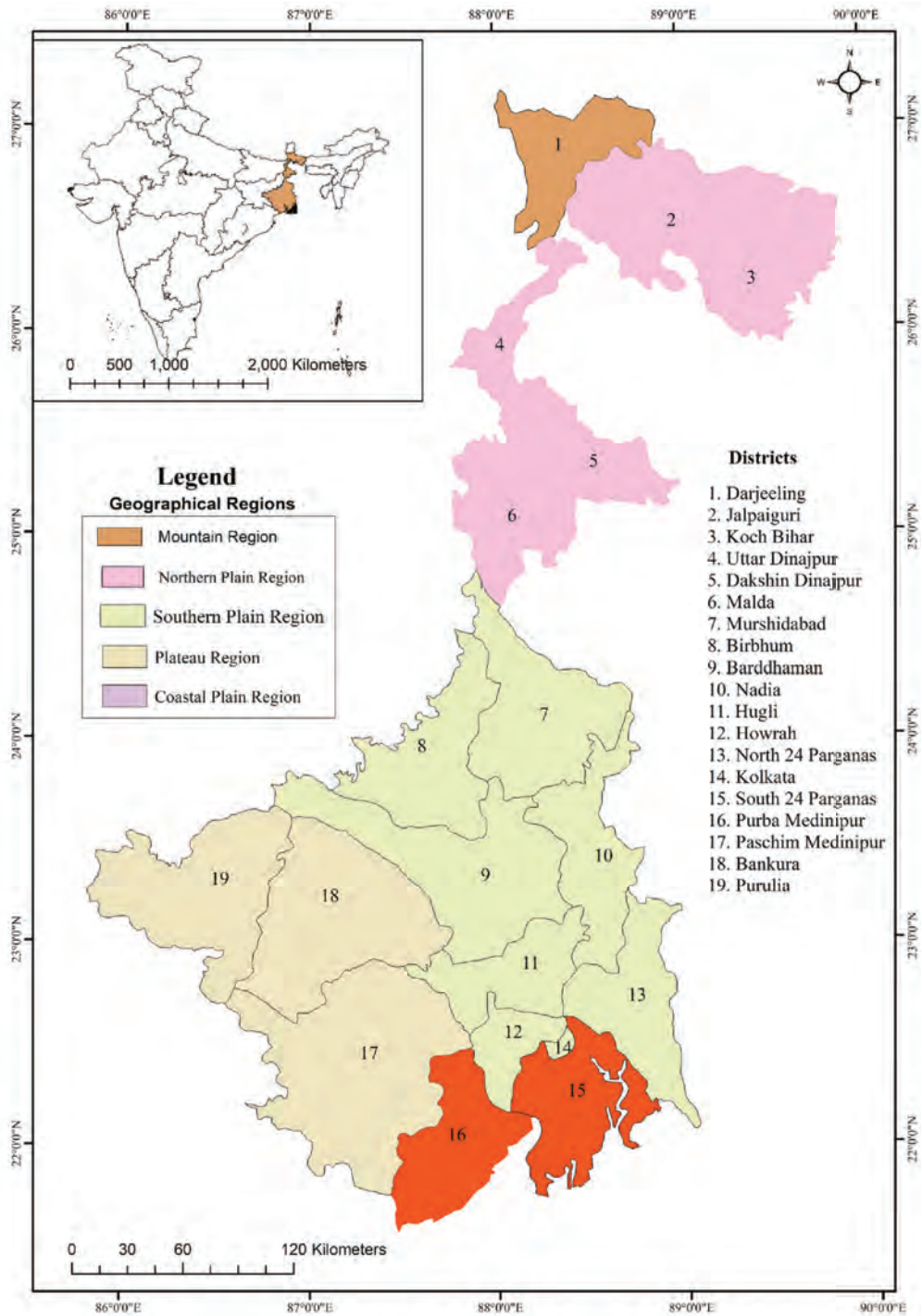
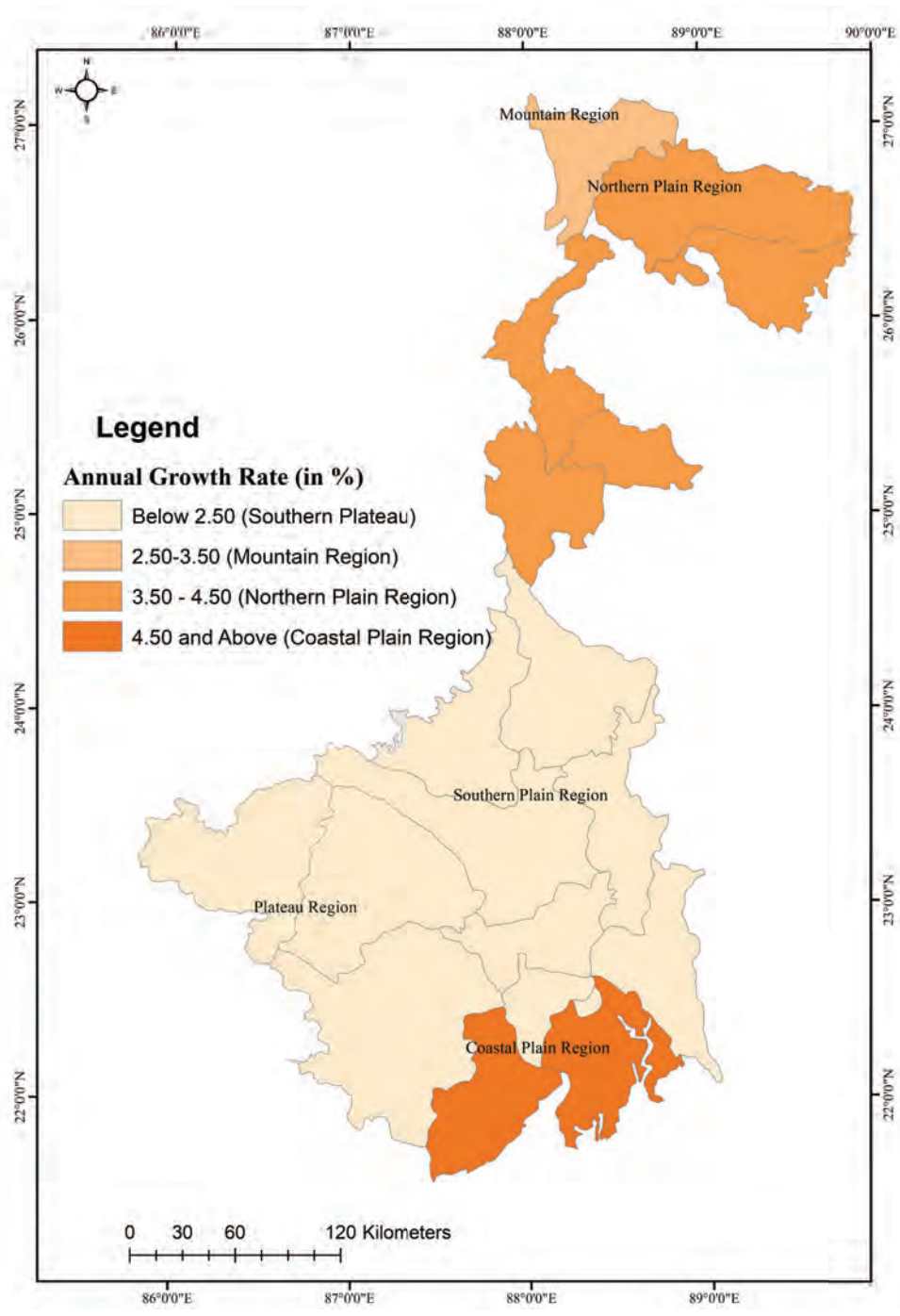Fig. 1: West Bengal: Geographical regions

Fig. 2: Regional variation of urban population growth rate in West Bengal, 1991-2011.

Table 1: Trend in Urban Population Growth in West Bengal (1901-2011)

Year	Urban Population	Annual Growth Rate (%)		Percentage of Urban Population (%)	
		India	West Bengal	India	West Bengal
1901	20,66,550	-	-	10.84	12.19
1911	23,49,608	0.03	1.29	10.29	13.05
1921	25,17,874	0.80	0.69	11.18	14.40
1931	28,95,867	1.76	1.41	11.99	15.32
1941	47,40,222	2.81	5.05	13.86	20.40
1951	62,81,642	3.53	2.86	17.29	23.88
1961	85,40,842	2.37	3.12	17.97	24.45
1971	1,09,67,033	3.29	2.53	19.91	24.74
1981	1,44,46,721	3.88	2.79	23.34	26.46
1991	1,87,07,601	3.16	2.62	25.70	27.48
2001	2,24,27,251	2.77	1.83	27.29	27.97
2011	2,90,93,002	2.80	2.64	31.20	31.89

Source: Census of India, 1991, 2001 and 2011, Primary Census Abstract, India

The post-independence period witnessed slow but steady increase in the level of urbanization in the state following moderately high growth rate of urban population during 1951-2011 (Table 1). As a consequence, there had been a net addition of urban population from 2.26 million during 1951-1961 to 6.67 million during 2001-2011 in the state.

Components of urban population growth

The urban population growth in West Bengal as in any other area is associated with four components, viz. natural increase, reclassification, migration and urban area expansion. Accordingly, the component analysis of urban population growth during 1971-2011 is beneficial in understanding the relative importance of each component to the overall urban population growth in the state.

So far the state of West Bengal is concerned; the contribution of natural growth had been most important contributing factor during 1971-1991 (43.47%), followed by the factor of migration and urban area expansion (31.23%); but the factor of reclassification of towns was significant (56.49%) during 1991-2011 (Table 2). As high as 5.87 million people had been added to make the total urban population of the state reaching 29.09 million in 2011 due to reclassification, i.e. emergence of new urban centres including census towns during 1991-2011.

Spatial variation in growth

One of the most important characteristics of growth of urban population in West Bengal is its unbalanced spatial pattern in every subsequent decade. The inter-regional variation in urban growth reveals that the growth has been largely confined to less urbanized regions except the mountain region. It has been as high as 5.02 percent in coastal plain region, followed by 3.58 percent in northern plain region and 3.09 percent in mountain region during 1991-2011 as

Table 2: Contribution of urban population growth in West Bengal, 1971-2011

Year	Total urban	increase	Components of Urban Population Growth (%)		
			Natural growth	Reclassification	Migration and Urban area expansion
1971	10,967,033	-	-	-	-
1991	18,707,601	7,740,568	43.47	14.62	31.23
2011	29,093,002	10,385,401	29.03	56.49	14.48

Source: Census of India, 2001, Sample Registration System Bulletin, Vol. 35, No. 2, West Bengal

against the state average of 2.23 percent. On the other hand, the most urbanised southern plain region with an urbanization level of 45.07 percent, where Kolkata metropolitan region is located, has witnessed a growth rate of only 1.87 percent (Table 3). But its contribution to total urban population growth during 1991-2011 in the state has been as high as 64.92 percent. Due to overall industrial and agricultural backwardness, the plateau region comprising Purulia, Bankura and Paschim Medinipur districts occupies the lowest position in the state in respect of both

urbanization level (11.22 percent) and urban growth rate (1.59 percent) (Fig. 2).

Spatial pattern in urbanization

Although the level of urbanization (31.89%) in West Bengal as per 2011 Census is slightly higher than the national average (31.20%), spatially it varies from 11.22 percent in plateau region to 45.07 percent in southern plain region (Table 3). The extent of variation gets further accentuated when the data is analysed at the district level varying from as low as 8.33 percent in Bankura district of

Table 3: Inter-regional variation in urban growth rate (1991-2011) and urbanization level (2011), West Bengal

Geographical Regions	Annual growth rate of urban population 1991-2011(%)	% urban population (2011)
1. Mountain Region	3.09	39.42
2. Northern Plain Region	3.58	16.21
3. Southern Plain Region	1.87	45.07
4. Plateau Region	1.59	11.22
5. Coastal Plain Region	5.02	20.22
West Bengal	2.23	31.89
India	2.79	31.20

Source: Census of India, 2011, District Census Hand Book,West Bengal

Note: **Mountain Region** includes Darjeeling, **Northern Plain Region** includes Jalpaiguri, Koch Bihar, Uttar Dinajpur, Dakshin Dinajpur and Maldah; **Southern plain Region** includes Murshidabad, Birbhum, Bardhhaman, Nadia, Hooghly, Howrah, and Kolkata; **Plateau Region** includes Purulia, Bankura and Paschim Medinipur; and **Coastal Region** includes South 24 Parganas and Purba Medinipur.

the plateau region to as high as 100 percent in Kolkata district of southern plain region. Only a few districts apart from Kolkata experienced a level of urbanisation higher than the state average. These districts include Haora, North 24 Pargana, Barddhaman and Hugli in southern plain region, and Darjeeling in mountain region (Fig. 3). The inter-district variation in the level of urbanization closely corresponds to the extent of variation in industrialization, resource base and its mobilisation, social development and other geographical factors including degree of transport accessibility (Sivaramakrishnan *et al.*, 2005). However, the Lorenz curves and associated values of Gini's coefficient for the period 1971-2011 reveal that the degree of spatial variation in the level of urbanization in the state has been continuously declining over time (Fig. 4).

Size-class composition and distribution of urban population

The Census of India classifies all the urban centres into six classes based on their population size, i.e. class I with a population size of 100,000 and above (also known as cities); class II with a population of 50,000-99,999; class III with population size 20,000-49,999; class IV with a population size 10,000-19,999; class V with population of 5,000-9,999; and class VI with population below 5,000. The distribution pattern of these urban centres is significantly uneven both spatially and temporally (Bhagabati, 1996) as influenced by factors of location, diverse terrain condition and highly variable socio-economic situations. The number of cities (with population 100,000 and above) grew from 15 in 1971 to 62 in 2011 with consequent increase in the share of their population from 55 percent to 62 percent during 1971-2011 (Table 4). This has been due to fast increase of population in these cities leading to heavy concentration of population in this category in the state (Datta, 2006). Among the towns of other categories, the small towns under class IV and V also witnessed a higher growth rate of population as compared to that of the class II and class III (Table 4). The annual growth rate of population among the smallest towns (Class VI) during 1971-2011 has however been found to be the highest in

Table 4: Size-class urban population distribution in West Bengal, 1971-2011

Size class	Population Size	Number of Towns			% to total urban population			% Annual Growth Rate
		1971	1991	2011	1971	1991	**2011**	
I	100,000 and above	15	42	62	54.91	64.14	61.96	2.78
II	50,000 to 99,999	31	35	37	19.38	13.07	8.80	0.47
III	20,000 to 49,999	49	64	81	13.54	10.29	8.08	1.16
IV	10,000 to 19,999	60	95	199	7.52	7.35	9.34	3.02
V	5,000 to 9,999	59	126	446	4.02	4.71	10.52	4.96
VI	Below 5,000	9	20	88	0.63	0.44	1.30	6.02
	Total	223	382	913	100	100	100	

Source: Calculation based on Census of India, 1971, General Population Table, Series 26, West Bengal; Census of India, 1991, District Profile, West Bengal; Census of India, 2011, Primary Census Abstract, West Bengal.
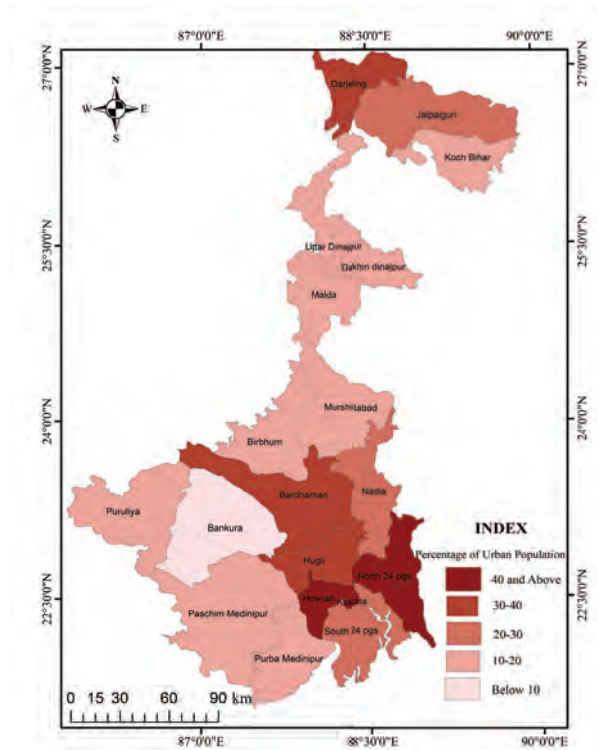
Fig. 3: District wise variation in Level of Urbanization in West Bengal, 2011.
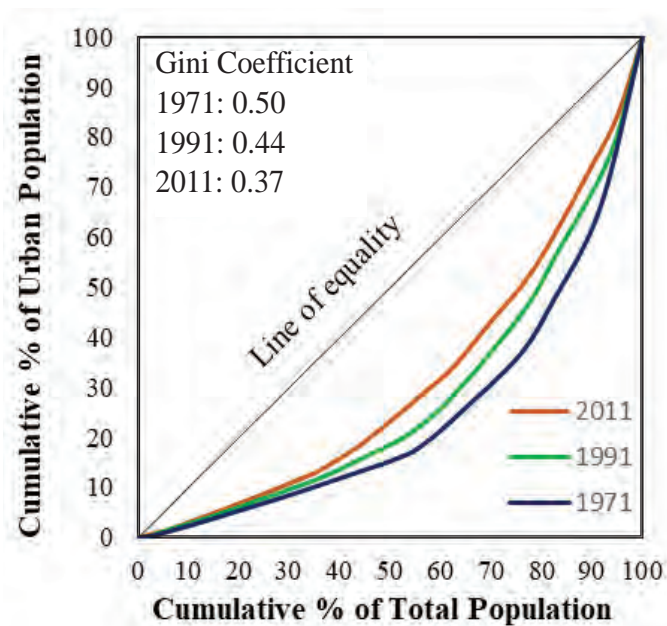

Fig. 4: Spatial distribution of urban population in West Bengal, 1971-2011.

the state. It has been observed that during 1971-2011, the large urban centres including these cities have begun to experience slower growth rate as compared to the smaller ones. This is indicative of faster growth of the small category towns in recent times, which has contributed towards start of the process of balanced urban development in the state. Significantly, the number of smaller order urban centres in class V and class VI in the state had witnessed dramatic increase up to 9 times during 1971-2011. Many researchers point to the fact that the phenomenal increase in unorganised and informal manufacturing activities in the 1990s which provided employment in rural areas and small towns has triggered the growth of the small towns (Sarkar, 2006; Khasnabis, 2008; Guin and Das, 2015). Moreover, the fast expansion of transportation and mass media across the state and growing job opportunities and lower cost of living in the small towns have attracted many people from the rural areas to the small towns instead of large metropolitan cities (Khasnabis, 2008).

So far, the distribution pattern of urban centres of different size class is concerned; there exists marked regional variation across the state. The cities account for a very high (68.92%) share of the urban population in southern plain, but account for only 39.66 percent in the northern plains. The class II towns are missing in the mountain region, while it accounts for 20.55 percent in northern plains. Likewise, class III towns account for 16.06 percent in the mountain region but only 6.13 percent in the southern plains (Table 5). This pattern is also found to generally resemble the structure of the country as a whole. A marked concentration of large cities is however seen as the most distinguishing characteristic of urban structure of the southern plain region (Fig. 5).

Rank-Size relationship and changing urban development

Rank-size relationship analysis of urban centres for the period 1971-2011 reveals by and large an unbalanced urban development in West Bengal. The urban development continues to be centred on faster growth of mega Kolkata metropolitan city, whose population has remained much higher than that of the corresponding expected population for the entire period. It means the growth of primate city Kolkata has been such that it has shadowed the possible growth of the lower

Table 5: Regional distribution of urban population by size-class in West Bengal, 2011

Geographical Regions	Percentage of urban population					
	Class I	Class II	Class III	Class IV	Class V	Class VI
Mountain region	56.89	0.00	16.06	14.25	10.69	2.11
Northern plain region	39.66	20.55	12.24	14.13	11.47	1.95
Southern plain region	68.92	6.65	6.13	8.31	9.00	0.99
Plateau region	45.52	19.12	8.88	9.45	16.86	0.18
Coastal plain region	40.50	12.89	12.54	11.83	18.66	3.59
West Bengal	61.95	8.80	8.08	9.34	10.52	1.30
India	60.45	10.96	15.43	8.45	4.21	0.51

Source: Calculation based on Census of India, 2011, District Census Hand Books, West Bengal

Table 6: Trend of Primacy in Urban system of West Bengal, 1971-2011

State	Year	1st Ranking Urban centres and Population	2nd Ranking Urban centres and Population	Primacy Index
West Bengal	1971	Kolkata (70,31,382)	Asansol (2,41,792)	29.08
	1991	Kolkata (1,10,21,918)	Asansol (7,63,939)	14.43
	2011	Kolkata (1,40,57,991)	Asansol (12,43,414)	11.31

Source: Census of India, 1971, General Population Table, Series 26 West Bengal; Census of India, 1991, State District Profile, West Bengal; Census of India,1991, Primary Census Abstract, West Bengal.

order urban centres in the urban system. However, there has been a discernible change in the trend of the urban structure in recent decades, particularly since 1991 (Fig. 6). In fact, a degree of diversification is seen in the urban system due to considerable growth of lower order urban centres in the state, and as revealed from a decline in the steepness of the gradient in 2011 as compared to that of 1991. There has been a marked increase in the difference between actual and expected population of the primate city of Kolkata in 2011 as compared to that of 1991; its growth has been checked significantly during 1991-2011. This recent change suggests more balanced urban system to emerge in near future.

The urban system in West Bengal is dominated by the primate city of Kolkata ever since the colonial rule generally characterized by political unity, underdevelopment and imbalance in the distribution of cities (Das and Dutt, 1993). The development of any urban system can be understood through the growth of its primate city, and for that matter its primacy index. Despite a marked decline in primacy index from 29.08 to 11.31 during 1971-2011, the urban system is still highly unbalanced (Table 6). The continued dominance of Kolkata city has kept the growth of all other urban centres in the state including the second ranking Asansol city far behind. However, the situation has considerably improved as Asansol of late experienced much faster growth in recent times along with other lower order urban centres in terms of their population, functions and facilities.

The urban development of any area in reality is inherent in the socio-economic characteristics of its population. As far as the level of urban development, which is calculated based on ten related indicators using composite Z-score, across the state of West Bengal at district level is concerned, it is found to be quite uneven. It is found to be the highest in Kolkata district (17.97) and lowest in Murshidabad district (-14.46). In fact, both the districts of Kolkata and Murshidabad are located in the southern plain region. It means although the performance in respect of level of urbanization and other socio-economic parameters is quite encouraging in this region, there exists marked spatial variation among the districts. The districts that witness better position in urban development in southern plain region include North 24 Pargana, Hugli and Haora. Among other districts, the picture is somewhat encouraging in Darjeeling district of mountain region, and
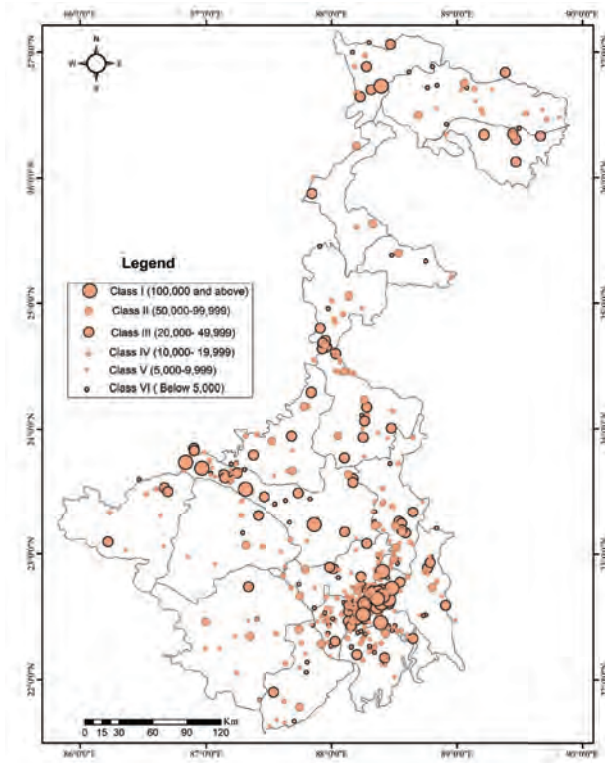
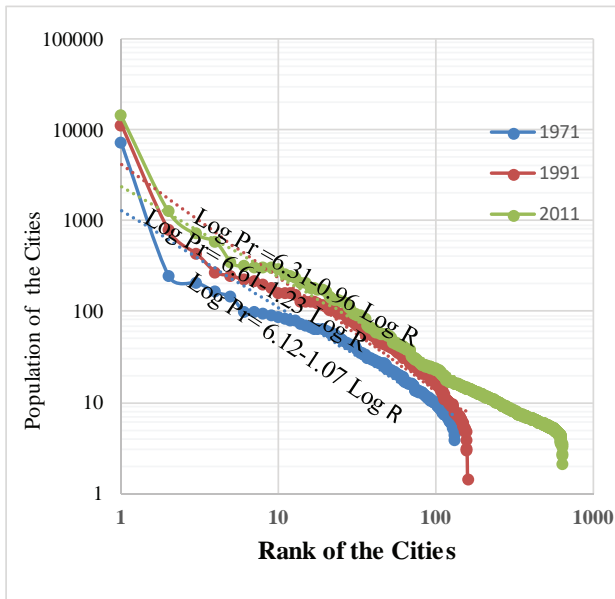Fig. 5: Size-Class Distribution of Urban Centres in West Bengal, 2011

Fig. 6: Rank-Size Relationship of Urban Centres in West Bengal, 1971-2011.

discouraging in Maldah and Uttar Dinajpur districts of northern plain region, Purulia district of plateau region, Purba Medinipur district of coastal plain region and Birbhum district of southern plain region. That urban development of any area with respect to socio-economic well-being of its people goes hand in hand with the growth of urbanization level is very much reflected in the case of West Bengal, and accordingly the extent of relationship between both the urbanization level and level of socio-economic well-being is found to be quite high (r= +0.77). When the value of urbanization level is excluded from the calculation of composite Z-score of level of socio-economic well-being, it is still found to be as high as +0.68. It means that besides bringing about impact on the rural areas, the increased level of urbanization in West Bengal greatly contributes to improvement in the socio-economic well-being of the urban dwellers.

Conclusion

The foregoing analysis reveals that urban growth in the state of West Bengal has been steady and in correspondence with the country as a whole. So far, the regional variation in the level of urbanization is concerned, it is quite uneven with southern plain region recording the highest and plateau region the lowest. In terms of the components of urban population growth in the state, natural growth was the main driving force of urbanisation during 1971-1991 but reclassification contributed more to it during the next decade. There has been high concentration of urban population in class I category, and it is more so in the southern plains due to the presence of Kolkata mega city region. However, the recent proliferation in the number of small towns is indicative of de-concentration of urban population in the state and consequent decline in urban primacy due to slow growth of Kolkata metropolis combined with fast growth of second ranking Asansol city and lower order urban centres. This phenomenon is indicative of emerging trend of a somewhat balanced urban development in the state

Notes

[1] As per Census of India, a settlement with a minimum population of 5,000, population density of 400 persons/km2 and 75 percent of male working population engaged in non-agricultural activities is known as Census town.

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Sriparna Das*,
Research Scholar, Department of Geography,
Gauhati University, Guwahati

Bimal K. Kar,
Professor, Department of Geography,
Gauhati University, Guwahati

*Author for corresponding
E-mail: mistusri25thmay@gmail.com