SPATIO-TEMPORAL ANALYSIS OF URBANISATION IN COOCH BEHAR DISTRICT, WEST BENGAL, INDIA

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ABSTRACT

Urbanisation has been viewed as an important factor in the areas of economic, social and environmental transformation of any region. High level of inter district disparity of urban development in West Bengal recommends importance to the study related to district level urbanisation. The main objective of the present study was to evaluate the spatio-temporal phase of urbanisation in Cooch Behar district by analysing census data in the form of level of urbanisation, urban growth differential, scale of population concentration and Eldridge Index. It is found that like other districts of West Bengal, Koch Bihar also has seen a remarkable urbanisation process during last few decades. Although the level of urbanisation is always below the state and country level. The maximum growth was recorded during the decade of independence due to huge amount of immigration. In terms of spatial variation Cooch Behar-I and II blocks are more urbanised than others. The population concentration in and around Cooch Behar town is maximum because of socio-economic and administrative viability.

Keywords: *urbanisation, spatio-temporal phase, scale of population concentration, Eldridge index.*

INTRODUCTION

Urbanisation is an index of transformation from traditional rural economies to modern industrial one (Kumar and Rai, 2014). It is a long term continuous process of progressive concentration of population in urban units (Davis, 1965). The emergence and development of urban centres i.e. urbanisation is necessarily a function of four factors: size of total population, control of natural environment, technological development and development of social organization (Datta, 2006). The onset of modern and universal process of urbanisation is relatively a recent phenomenon and is closely related with industrial revolution and associated economic development. The degree of urbanisation in an area is a fair index of level of its socio-economic development (Chandana, 2001).

India has a long tradition of urbanisation dating back to 2350 B.C (Siddhartha and Mukherjee, 2006). But after independence urbanisation entered in a new and more accelerated phase (Datta, 2006). As a city grows, the increasing concentration of population and economic activities demands that more land be developed for public infrastructure (roads, water facilities, and utilities), housing, and industrial and commercial uses. With an urbanisation level of 31.16 percent in 2011, India is the least urbanized country among the top 10 economies of the world (Chandrasekhar and Sharma, 2014). About 60% of the growth in the urban population in the past is due to natural increase whereas rural – urban migration has contributed to only about 20%. An increase in urban population has resulted into fast growing of towns and cities. But due to shortage of infrastructural services and amenities, these urban centres are facing a lot of environmental problems. An important feature of urbanisation in India is the dualism of urban growth decelerating at macro level. But in Class I cities it is growing. An analysis of the distribution of urban population across size categories reveals that the process of urbanisation in India has been large city oriented. This is manifested in a high percentage of urban population being concentrated in class I cities, which has gone up systematically over the decades in the last century. West Bengal was one of the most urbanised states in the country in the early part of the 20th Century and was mainly based on Kolkata city (Ghosh and Chakma, 2014). Dasgupta (1987) stated that urbanisation pattern was eventually evolved by the policy of the Britishers. But the scenario has changed in the 21st century with the development of new census towns and the district-level spatial pattern of urbanisation. Pattern of urbanisation in the state is now independent of the metropolis and existing urban-industrial region (Samanta, 2012).

As urbanisation has been viewed as an important factor in the areas of economic, social and environmental transformation of any region, study related to this dynamic process is pertinent. High level of inter district disparity of urban development in West Bengal recommends importance to the study related to district level urbanisation. The main objectives of the present study are:

i. To compare the degree of urbanisation in Cooch Behar District with state and country level; and

ii. To assess the spatio- temporal changes of urbanisation in and within the district.

STUDY AREA

The Cooch Behar District (also known as Koch Bihar) lies in the North Eastern part of the state of West Bengal. Geographically, Cooch Behar district is surrounded by district Jalpaiguri and Alipurduar to the North and West, State of Assam (Kokrajhar and Dhubri districts) to the East and International Boundary with Bangladesh towards South, South-East and South-West covering an area of 3387 sq. Km. which contributes 3.82% of the land mass of the State of West Bengal. The location of the district is spread over from 26º 32'20'' N to 25º 57'40'' N Latitude and 89º 54' 35"E to 88º 47' 40"E Longitude. The six river systems (Torsa, Jaldhaka, Kaljani, Raidak, Gadadhar and Tista) cut through the district among all blocks flowing in a south easterly direction. The soil is alluvial of very recent formation. It is mostly sandy and loose. The surface soil is loam and hardly any good clay is found. Administratively, Cooch Behar district is divided in to five Sub-Divisions comprising of twelve Community Development Blocks and Six Municipalities.

METHODOLOGY

The present study is completely based on data provided by the Indian Census and in fact, Census is the main source of data on urban population for not only India but also most of the countries of the world. In India since 1961, two important criteria namely: i. statutory administration (municipal corporations, municipality, cantonment board, notified area committee, etc.) and ii. economic and demographic aspects viz. population size (minimum 5,000 persons), density of population (at least 400

persons per sq. km.) and percentage of work force in non-agricultural sector (at least 75% of the male working population engaged in non-agricultural pursuits) have been adopted to declare certain settlements as urban areas. Census data were analyzed using Microsoft Excel 2007 and cartographically presented using ArcMap 10.2.1 and OriginPro 8.5. The methods used to show the spatio-temporal dynamics of urbanisation in the present study are:

Level of Urbanisation

It is expressed as:

$q=t\ (UP/TP) * 100$

where, UP (t) and TP (t) are the urban and total populations at time t, and q is the level of urbanisation.

Urban Growth Differential

The difference between the urban and total growth rates is called the Urban Growth Differential (UGD), can be measured as:

$UGD = t\ (UGR-TGR)$

Where, TGR is Total Growth Rate and UGR is stand for Urban Growth Rate at time t, UGD is the Urban Growth Differential.

Decadal growth of urban population

It is expressed as:

$DGR= [\{(P_n - P_o) / P_o\}* 100]$

Where, DGR= Decadal Growth Rate in %, P_n= Population now, P_o= Population originally, P_n and P_o are ten years apart.

Eldridge index

The Eldridge index is used to measure the pace of urbanisation (Vaidyanathan, 1981). It is formulated as:

$EI= [\{(PUP_n - PUP_o) / (100- PUP_o)\}* 100]$

Where, EI= Eldridge Index ,PP_n= Percent of Urban Population now, P_o= Percent of Urban Population originally, P_n and P_o are ten years apart.

Scale of population concentration

Scale of population concentration was measured to reflect the size hierarchy by considering all points of population concentration. It expressed as follows:

$Sp = \Sigma X$

where Sp is the measure, and X is the proportion of the total population in each size class.

RESULTS AND DISCUSSION

Temporal Changes in urbanisation

Table 1 presents the temporal phases of urbanisation in Cooch Behar district in the forms of decadal growth rate, urban growth differential and Eldridge index. Percentage of urban population is constantly increasing since 1901, at present 10.27 percent of total population live in urban areas although this share is greatly below the level of urbanisation in West Bengal (29.72 percent) and India (31.80 percent) which is shown in Figure 2. Decadal growth rate of urban population is also positive since 2001 but decadal growth of total population was negative in 1921 and 1931 due to famine and epidemical events. The maximum decadal growth of urban as well as total population were recorded in 1951 census. In the same decade the urban growth differential (+82.35) and pace of urbanisation i.e. Eldridge index (+3.44) were also highest. The main reason was independence of the country, results in partition between India and Pakistan. The external factor which contributed to urbanisation and also urban concentration immediately before and after independence was huge refuge migration from the eastern part of Bengal. this immigration rose to 1,45,916 out of a total population of 6,71,158 which is almost 21.75%. The growth rate of population in terms of total and urban were also comparatively higher in the decades of 1981 and 1991 because of huge infiltration from the neighbour state Assam due to communal conflict. Figure 3 shows that decadal growth of urban population is not always below the state and country levels, it is almost equal with the country level in 1951 and over the state level in 1951 and 2001. But in the last decade growth of urban population is less than the state and country levels. The reasons behind low level of urbanisation in Cooch Behar may be the geographical and administrative location of the district. It is far away

located from the capital city Kolkata (Kms away) and the city of Siliguri (Kms away). For this there is least effect of modern and large industries. The impact of globalization is also low comparatively to the other districts. There is no such a heavy industry in the district, only some household industries have been developed. The economy of the district is mainly based on agriculture and allied activities. The low literacy rate (74.8 percent) and low work participation rate (40.01 percent) are also two responsible factors for low level of urbanisation.

Spatial variation in urbanisation

Cooch Behar district from 1510 AD to 1949 AD was ruled by the famous Koch Dynasty. During British rule it was a Princely State. The Transfer of administration from the monarchal rulers to that of Indian Union took place in 12th September, 1949 and few months later in 19th January, 1950 the present district Cooch Behar of the State of West Bengal was officially formed. At present Cooch Behar district is divided into five sub-Divisions comprising twelve community development blocks and six municipalities which are shown in Figure 4. Although the present day Koch Bihar district is predominantly rural in nature, the history of establishment of well organised towns are as old as the rule of modern Koch Bihar Kingdom. According to Census, 2011 there is twelve census towns in the district and a spatial variation in the location of the towns I found. Maximum number of census towns (8) are located in Cooch Behar Sub-Division out of which five town are situated in Cooch Behar-II block namely Baneswar (4841), Khagrabari (23122), Takagachh (12418), Baisguri (5021) and Chakchaka (8582); and other three towns are in Cooch Behar-I block which are Dhalibari (4383), Guriahati (21064) and Kharimala Khagrabari (7844). In Mathabhanga Sub-Division there is no census town while in Mekhliganj and Dinhata the number is one i.e. Nagar Changrabandha (4483) which is in Mekhliganj block and Bhangi Pratham Khanda (4379) in Dinhata-I Block respectively and in Tufanganj Subdivision there are two census towns, Kamat Phulbari (5339) in Tufanganj-I block and Chhota Lankuthi (5480) in Tufanganj-II block. The development of eight census towns in Cooch Behar-I and II blocks mainly for the vicinity of the district head quarter Cooch Behar town.

Table 2 represents the scale of concentration of urban population in different classes of towns according to Indian Census classification and ranks of urban centres in Cooch Behar district. There is no class-I urban area in the district. The highest urban population (77935) live in Cooch Behar Municipality which is a Class- II census town (50000-99999) and 26.93 percent of urban population live in the town. Cooch Behar municipality is the primate city in the district in terms of historical, economic and administrative importance. The historical evidence of Cooch Behar Town can be traced way back in 1661 CE during the rule of King Prana Narayan when Mir Jumla, the Mughal appointed Subedar of Bengal had marched up to the Capital Town of Cooch Behar and seized part of the town. Later, King Rupa Narayan transferred his Capital to Guriahati which occupied a large portion of modern day Cooch Behar Municipality. Since then the Capital of the kingdom has remained Cooch Behar Town and the Kingdom of Koch Bihar was ruled from the town (Ghoshal, 1942). By the end of Nineteenth Century CE, the town took its modern shape and was declared as Municipality in 1885 and it is the largest unit of trade and commerce in the district and it retained the status till date. There are Five urban centres fall in class- III census towns namely Dinhata (M), Mathabhanga (M), Tufanganj (M), Khagrabari (CT) and Guriahati (CT) sharing 43.26 percent of total urban population in the district. In terms of population Khagrabari (23122) and Guriahati (21064) rank more than three municipalities i.e. Tufanganj, Haldibari and Mekhliganj municipalities. The lowest concentration of urban population found in class IV (9.26 percent) and class VI (6.25 percent) urban centres.

In terms of block level urbanisation, the most urbanised blocks are Cooch Behar-II(15.70 percent) and Cooch Behar-I (10.19 percent). The neighborhood of Cooch Behar municipality is the key factor behind this kind of concentration of urban

population in these two blocks. On the other hand, blocks which do not have urban population are Haldibari, Mathabhanga I and II, Sitalkuchi, Dinhata-II and Sitai. The main reason behind this is the frontier location of these blocks and rural to urban migration due to socio-economic factors.

CONCLUSION

Like other districts of West Bengal, Koch Bihar also has seen a remarkable urbanisation process during last few decades. Although the level of urbanisation is always below the state and country level. The maximum growth was recorded during the decade of independence due to huge amount of immigration. The percentage of urban share of Population of Cooch Behar District has increased from 9.1% (2001 Census) to 10.3% (2011 Census) of Total Population of respective Census. At present there are six statutory towns and twelve census towns in the district. Cooch Behar town is the main even primate town in the district. In terms of spatial variation Cooch Behar-I and II blocks are more urbanised than others. In these two blocks eight census towns are located out of twelve. The population concentration in and around Cooch Behar town is maximum because of socio-economic and administrative viability. Rural to urban migration and traditional agriculture based economy are two major factors behind the overall less urban development of the district.

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Table 1: Temporal alteration of Urbanisation in Cooch Behar District (Compiled by the authors)

Census Year	Total Population	Urban Population	% of Urban Population to Total Population	Decadal growth of Total population	Decadal Growth of Urban population	Urban Growth Differential	Eldridge Index
1901	565116	14060	2.49	-	-	-	-
1911	591012	15794	2.67	4.58	12.33	+7.75	+0.18
1921	590599	17261	2.92	-0.07	9.29	+9.36	+0.26
1931	589053	18030	3.06	-0.26	4.46	+4.72	+0.14
1941	638703	26821	4.20	8.43	48.76	+40.33	+1.18
1951	668949	50180	7.50	4.74	87.09	+82.35	+3.44
1961	1019806	71446	7.01	52.45	42.38	-10.16	-0.53
1971	1414183	96652	6.83	38.67	35.28	-3.39	-0.19
1981	1771643	122260	6.90	25.28	26.50	+1.22	+0.08
1991	2171145	169497	7.81	22.55	38.64	+16.09	+0.98
2001	2479155	225618	9.10	14.19	33.11	+18.92	+1.40
2011	2819086	289434	10.27	13.71	28.28	+14.57	+1.29

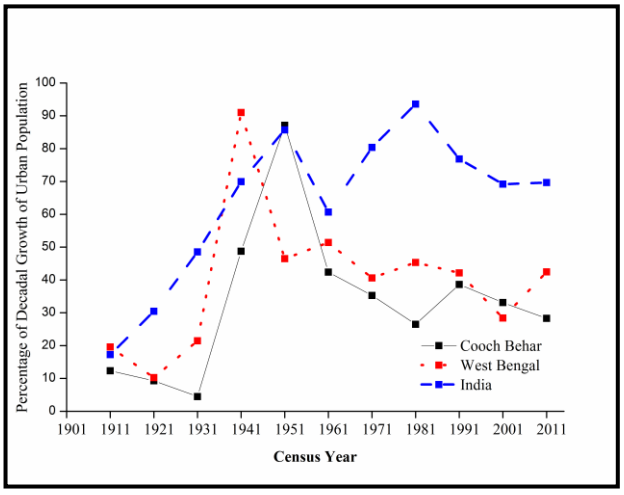

Figure 1: Level of Urbanisation

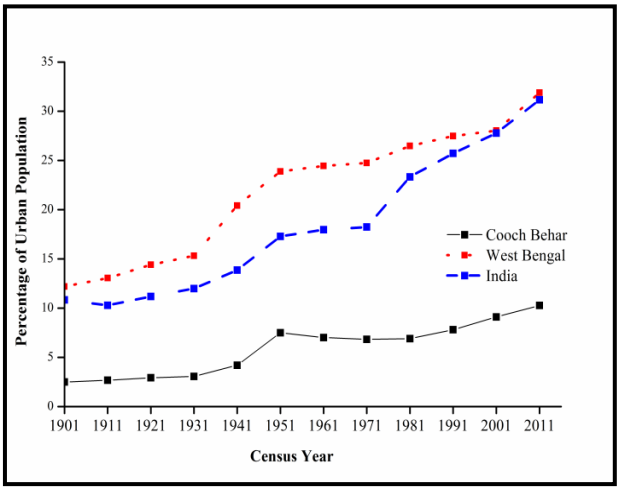

Figure 2: Decadal Growth of Urban Population

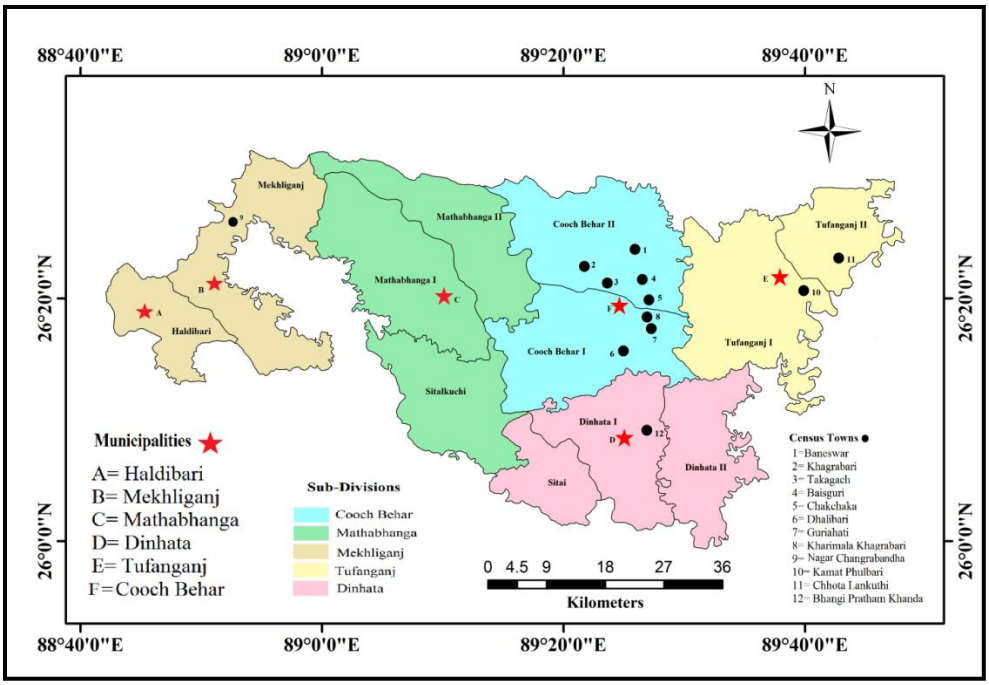

Figure 3: Block and Sub-Division wise Location of Urban Centres in Cooch Behar District (2011)

Table 2: Population Concentration in Urban Centres with their Total Population, Class and Ranks, Cooch Behar District (Compiled by the authors)

Urban Centres	Population (2011)	Rank	Census Class	Scale of Population Concentration (%)
Cooch Behar (M)	77935	1	II	26.93
Dinhata (M)	36,124	2		
Mathabhanga (M)	23890	3		
Khagrabari (CT)	23122	4	III	43.26
Guriahati (CT)	21064	5		
Tufanganj (M)	20998	6		
Haldibari (M)	14404	7		
Takagachh (CT)	12418	8	IV	9.26
Mekhliganj (M)	9127	9		
Chakchaka (CT)	8582	10		
Kharimala Khagrabari (CT)	7844	11	V	14.30
Chhota Lankuthi (CT)	5480	12		
Kamat Phulbari (CT)	5339	13		

Baisguri (CT)	5021	14		
Baneswar (CT)	4841	15		
Nagar Changrabandha (CT)	4483	16	VI	6.25
Dhalibari (CT)	4383	17		
Bhangi Pratham Khanda (CT)	4379	18		

Table 3: Block wise level of urbanisation in Cooch Behar District (2011)

CD Blocks	Total population	Urban Population	Level of Urbanisation	Rank
Haldibari	103,969	0	-	7
Mekhliganj	155,250	4483	2.89	4
Mathabhanga-I	218,191	0	-	7
Mathabhanga-II	227,397	0	-	7
Coochbehar-I	326,558	33291	10.19	2
Coochbehar-II	343,901	53,984	15.70	1
Sitalkuchi	185,353	0	-	7
Dinhata-I	286,269	4379	1.53	6
Dinhata-II	244,066	0	-	7
Sitai	110,333	0	-	7
Tufanganj-I	248,595	5339	2.17	5
Tufanganj-II	186,726	5480	2.93	3