Spatio-temporal analysis of Census Town: A Case Study of Bankura District, West Bengal

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Abstract—*The huge growth of population has become a great challenge in India now-a-days. From the geographic viewpoint, the Census Towns (CTs) are one of the major parameters to detect that changing population pattern along with the economic growth of the country. According to census of India, CTs can be defined by three major characters; an area where the population of 5,000 as the minimum, population density would be 400 persons per sq. km and at least 75 % of the male working force should be engaged non-agricultural sector (non-primary activities). In India, CTs grew from 1,362 in 2001 to 3,894 in 2011 which account for 30 % of the total urban population in the last decade. It also noted that the largest increase in the number of CTs was in Kerala and West Bengal (WB). Bankura is one of the oldest districts of WB which is locate in the western part of the state and popularly known as 'Rarh' from time immemorial. According to 2011 census, it contains a population of 35,96,974 and nine CTs. In this context, the present study deals with the emergence of CTs in the district Bankura from the post-independent periods to understand the spatial pattern and temporal growth of it. To serve this purpose, the block-wise census data (1951-2011) regarding CTs have been analysed through the well-known GIS software. It has been noted from the analysis that the growth rate of CTs is very slow and it is one or two blocks centric viz. Barjora block consists of maximum CTs.*

Keywords: *Census Towns (CTs), Bankura, Census data, GIS.*

1. INTRODUCTION

The process of urbanisation in India is very rapid, according to census 2011, about 377 million of people live in 7935 town/cities. It has increased faster than expected [1]. High inequality in the distribution of the urban population by size class categories [2]. Urbanization process has become concentrated in developed regions and larger cities in recent years. The 2011 census identified 3,894 settlements as Census Towns while there were only 1,362 such settlements in the 2001 census. Of the total urban growth of approximately 90 million people, almost a third is attributed to the new census towns, i.e., change in the character of settlements [3]. Accordingly, the sharp increase in the numbers of census towns between 2001 and 2011 did not only translate into the expansion or consolidation of metropolitan areas, but has also led to a significant spatial transformation of rural areas [4]. The total urban area grew by about 24,000 sq.km which was roughly equivalent to the amount of agricultural land whose use shifted to non-agricultural and more than a third of the increase in urban areas, about 9000 sq.km, was on the account or reclassification of villages into Census towns [5]. West Bengal is one of the most populous states in India and according to the 2011 census the state has 31.87 percent of urban population. The state of West Bengal tops the list with total 782 census towns against the figure of 252 in the previous census. Major contribution of this increase was due to increase in number of census towns which are not governed by urban local governments [6]. The district Bankura of West Bengal has long history Urbanization. Its lopsided pattern of urbanization is evolved over two hundred years as a consequence of colonial economic and administrative policy [7]. The urbanisation of Bankura district traditionally concentrated in Bankura, Bishnupur and Sonamukhi. Rest of the district is backward and neglected due to its agricultural base activity and ancient household industry [8]. Recently published census data on urbanization reveals that the level of growth of census towns in this district is very vigilantly higher than the previous decade's census report [9], [10]. But still now There is limited literature on census towns since they are neither studied separately as urban areas or rural areas [11]. In that context the present study has tried to investigate the spatial distribution and temporal changes of census towns across the district Bankura using the District census Hand Book (DCHB) 2011 and beyond. The urbanisation Bankura district was dominating of urban scene by the district town Bankura and the temple-town Bishnupur even after the six decades of independence. Now-a-days situation has changed slightly due to emergence of CTs in different blocks of this district.

2. STUDY REGION

The study region is Bankura District (see Figure 1) which is lies in the western periphery of the state West Bengal. Bankura is situated between $22^0 38''$ and $23^0 38''$ North latitudes & between $86^0 36''$ and $87^0 46''$ East longitudes. It has an area of 6882.00 sq.km. According to the Census of 2011, contains a population of 35,96,674 and nine CTs. It formed the Western boundary of the state bordering Bihar (now Jharkhand) till 1956 when Purulia was included in West Bengal and formed the western most boundary of the state. It includes twenty-two Community Development (CD) blocks.
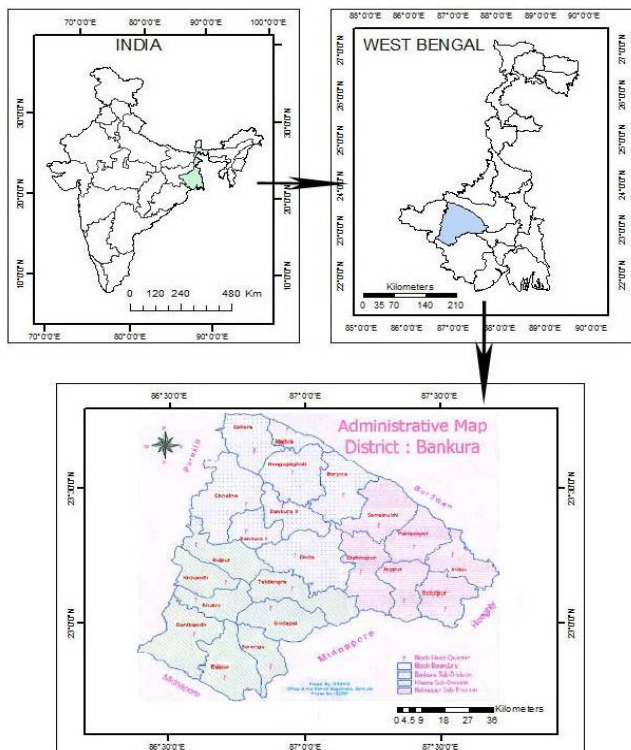
LOCATION MAP

Figure 1: Study region map (source www.google.com)

3. DATASETS AND METHODOLOGY

Mainly the census data has been utilized for the present study. These secondary datasets have been downloaded from the respective website as DCHB (1951 to 2011). Some datasets such as the details of the district has been collected from the district Magistrate office, Bankura. Apart from that different published article has been used for the fulfilment of the study.

Methods include compilation, calculation and presentation of collected data. Socio-economic data of census towns of Bankura has been analysed and presented in a tabular form with percentage and ratio. The well-known GIS software has been utilized to represent the block-wise spatial distribution

and temporal growth (1951 to 2011) of census towns of Bankura in a systematic manner. The flowchart of methodology is represented in figure 2.
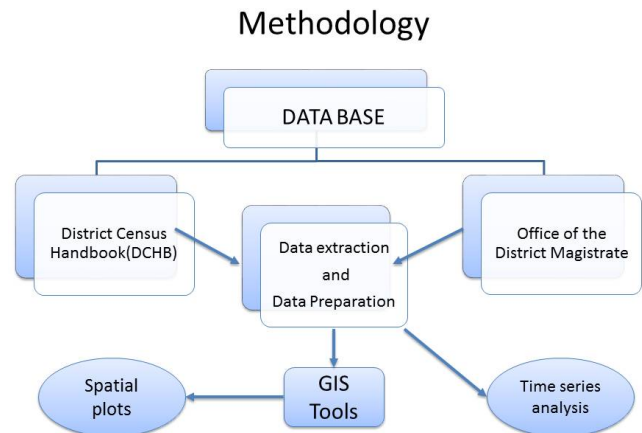

Figure 2: Methodology

4. RESULTS AND DISCUSSIONS

The definition of an urban unit at the 1981 Census is as follows:

A. All places with" a Corporation, Municipality, Town Committee, Notified Area, Cantonment.
B. All other places which satisfied the following criteria:
    i.   A population of 5,000 as the minimum,
    ii. Density per square kilometer would be a minimum of 400 and
    iii. At least 75% of the male working force should be engaged non-agricultural pursuits.

It was similar to the urban criteria of 1961 and 1971 except the occupation like fishing, livestock, hunting, logging, plantations and orchards etc. which were treated as non - agricultural activities [12]. All other areas which are not covered by the definition of urban as stated above will be treated as Rural. Apart from these a Census Town should be fulfilling those following criteria:

1. A population of 5,000 as the minimum
2. Density per square kilometer would be a minimum of 400
3. At least 75% of the male working force should be engaged non-agricultural pursuits.

It is to be noted that census towns are those towns that has been recognized census of India on the basis of certain predetermined criteria. State authority may not recognize the area as urban.

India has seen the formation of urban local bodies since the time of Indus Valley Civilization. The first Municipal Corporation was set up at erstwhile Madras (now Chennai) under a charter granted by James-II during the British rule in

1687. The district Bankura consists of only three statutory towns (exist municipalities) viz. Bankura, Bishnupur and Sonamukhi which into existence in the 19th century. The emergence of CTs in Bankura is remarkable. According to 2011 census data Bankura enlists with total nine CTs where there were only two CTs in 1991 and 2001 (see Figure 3). Earlier the term was Non-Municipal Town (NTs) instead of CTs and there were two NTs beyond 1991.
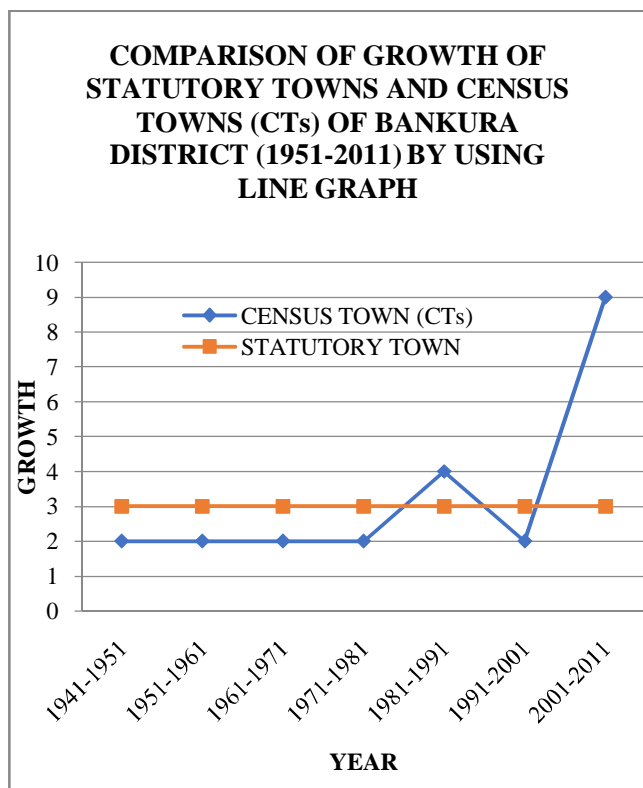

Figure 3: Temporal growth of CTs along with Statutory Town in Bankura district (1951-2011)

According to 2011 census Bankura has 8.33 % urban population with a decadal growth rate of 2.74 % which was 0.74 % in 2001(see Figure 3). Increase of Such a huge urban population is possible due to emergence of large number o CTs in the District. However, recent study on spatial pattern of CTs indicate that maximum number of towns have emerged in the agriculturally or industrially prosperous blocks located in the several parts of the district.
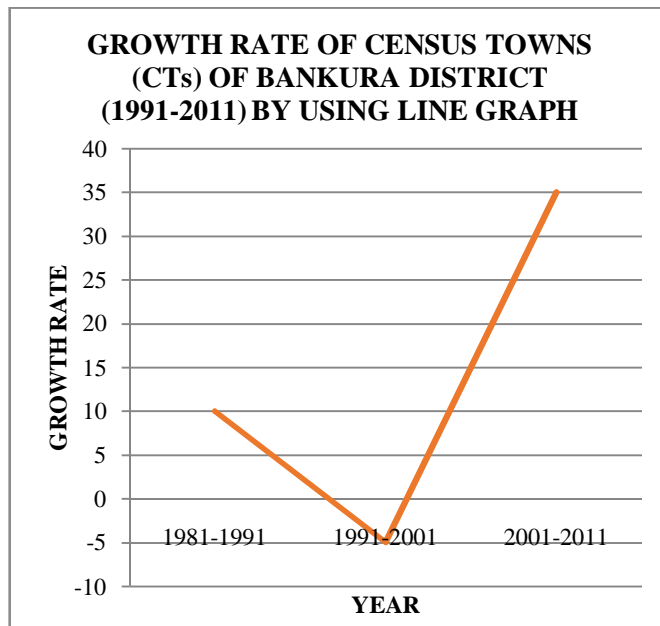

Figure 4: Growth rate of CTs in Bankura District (1981-2011)

The total nine CTs are concentrated in six CD Blocks i.e. Barjora, Khatra, Chhatna, Kotulpur, Simlapal and Raipur (see Table 1). The maximum three CTs have emerged in Barjora Block (see Figure 5) namely Barjora, Beliatore and Ghutgarya due to concentration of industrial sector in that block.

Table 1: C D Block-wise distribution of CTs in Bankura District (1951-2011)

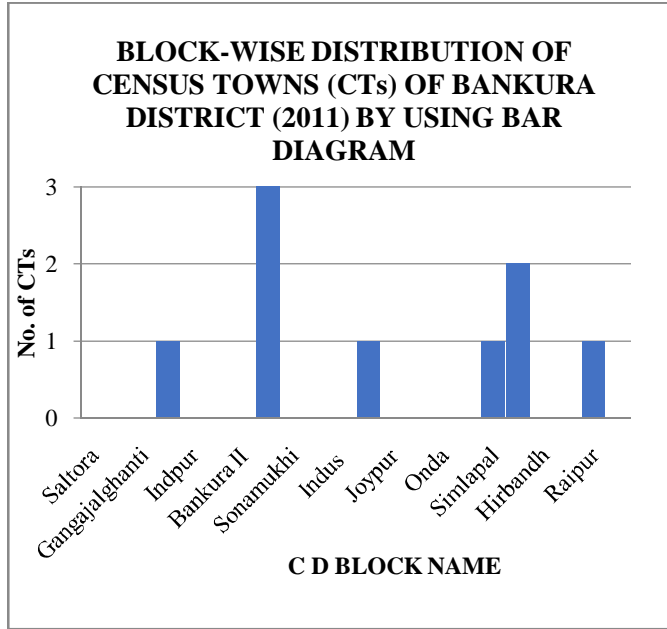| Sl. No.	C D Blocks	CTs (2011)	CTs (2001)	NTs (1991)	NTs (1981)	NTs (1971)	NTs (1961)	NTs (1951)
1	Saltora	0	0	0	0	0	0	0
2	Mejhia	0	0	0	0	0	0	0
3	Gangajalghanti	0	0	0	0	0	0	0
4	Chhatna	1	0	0	0	0	0	0
5	Indpur	0	0	0	0	0	0	0
6	Bankura I	0	0	0	0	0	0	0
7	Bankura II	0	0	0	0	0	0	0
8	Barjora	3	2	2	0	0	0	0
9	Sonamukhi	0	0	0	0	0	0	0
10	Patrasayer	0	0	1	1	1	1	1
11	Indus	0	0	0	0	0	0	0
12	Kotulpur	1	0	0	0	0	0	0
13	Joypur	0	0	0	0	0	0	0
14	Vishnupur	0	0	0	0	0	0	0
15	Onda	0	0	0	0	0	0	0
16	Taldangra	0	0	0	0	0	0	0
17	Simlapal	1	0	0	0	0	0	0
18	Khatra	2	0	1	1	1	1	1
19	Hirbandh	0	0	0	0	0	0	0
20	Ranibundh	0	0	0	0	0	0	0
21	Raipur	1	0	0	0	0	0	0
22	Sarenga	0	0	0	0	0	0	0
23	Total	9	2	4	2	2	2	2

Figure 5: C D Block-wise distribution of CTs in Bankura District (2011)

To represent the urban population (CTs) of different block in Bankura district, a choropleth map (see Figure 6) has been prepared containing five zones of population using advance GIS techniques.
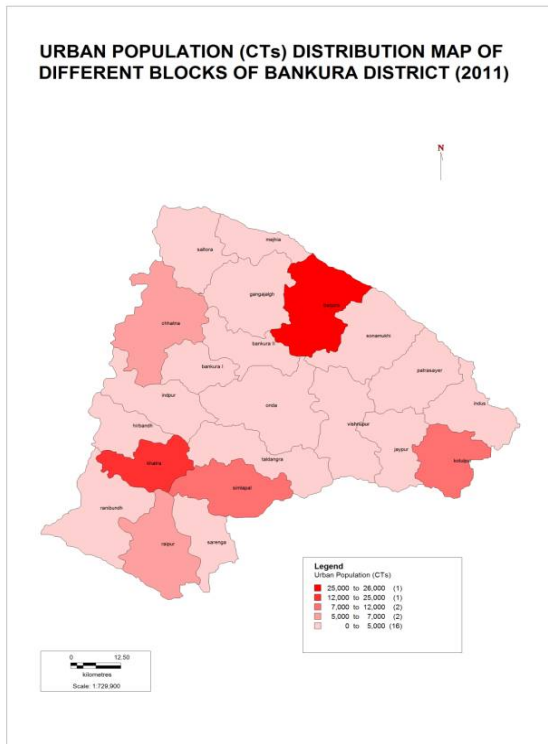
Table 2: Spatial distribution of CTS in different Blocks of Bankura (2011)

Sl. No.	C D Blocks	Census Towns	Area (sq. k.m.)	Urban Population	Urban Population Density
1	Barjora	Barjora	7.25	14012	1933
2		Beliatore	1.52	6463	4252
3		Ghutgarya	3.64	5311	1459
4	Kotulpur	Kotulpur	5.65	8483	1501
5	Simlapal	Simlapal	4.00	7206	1806
6	Khatra	Khatara	1.62	7382	4557
7		Ledisol	1.41	5056	3586
8	Raipur	Raipur Bazar	2.42	6280	2818
9	Chhatna	Jhanti Pahari	3.89	5326	1369

Barjora Block has highest urban population of 25,786 as it consists of three CTs. The urban population in Khatra block is second highest, 12,438. It has two CTs and the remaining four CTs namely Simlapal, Kotulpur, Raipur bazar and Jhanti Pahari are located in four C D Blocks which are Simlapal, Kotulpur, Raipur and Chhatna respectively. The Chhatna block has lowest urban population of 5,326 as per 2011 DCHB of Bankura district (see Table 2). The block wise distribution of CTs are represented in figure no. 7.
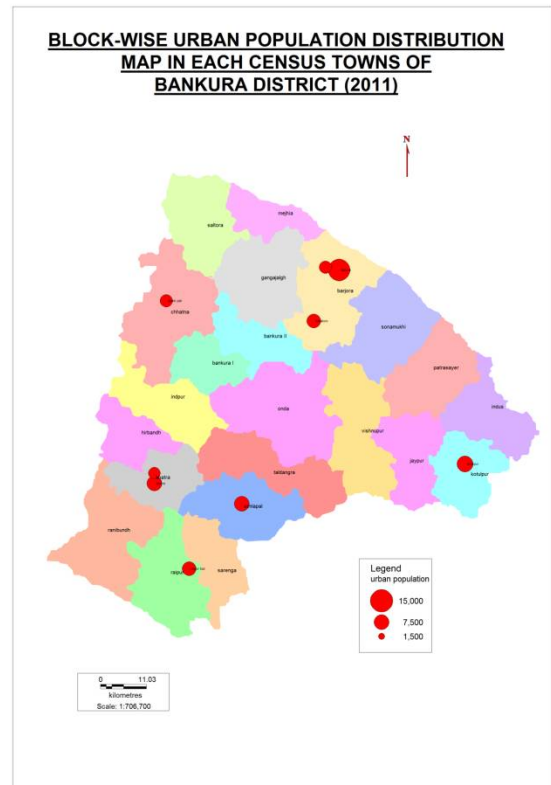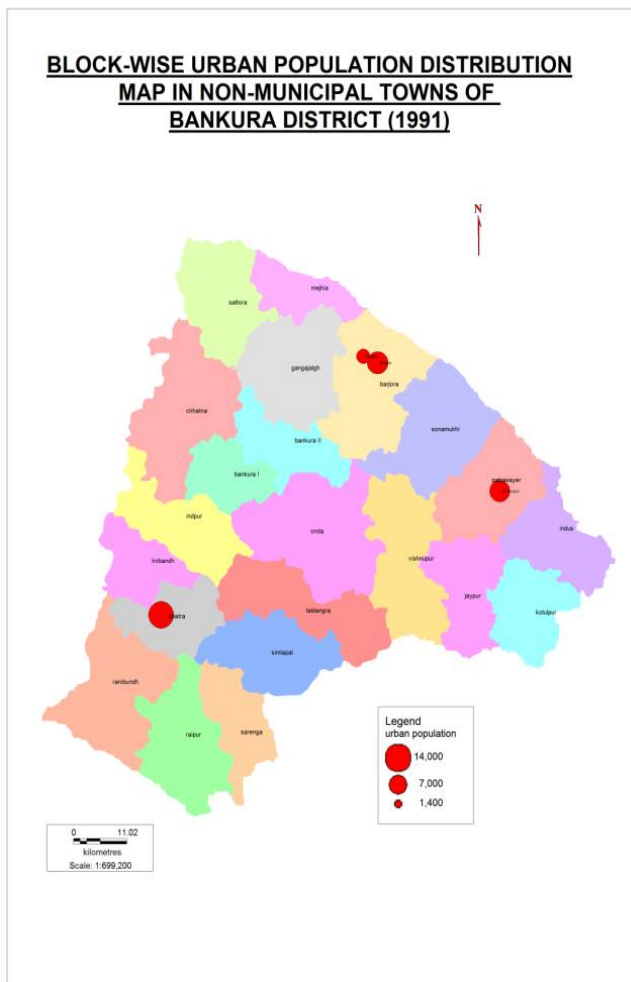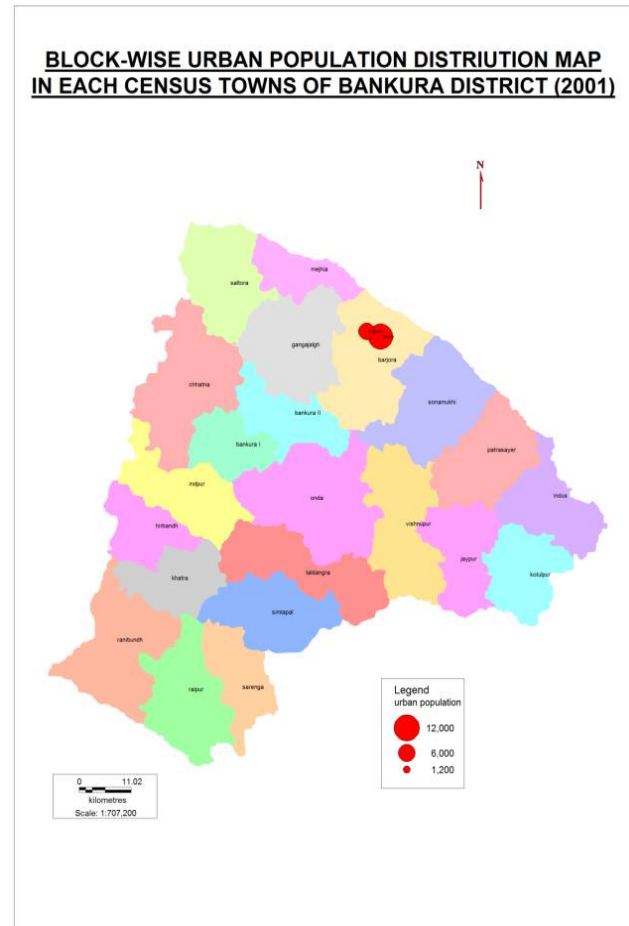

Figure 6: Block-wise spatial distribution of urban population in Bankura District in 2011 using GIS tools

Figure 7: Block-wise spatial distribution of CTs in Bankura District in 2011 using GIS tools

The highest number of urban populations is concentrated in Barjora Block, especially Barjora CTs. The rapid growths of mining-based industry and agro-based industry may be the main causes behind the emergence and growth of these CTs. This region is also developed in terms of transport and communication.

To get the clear understanding about the temporal changes of CTs in Bankura District, block-wise distribution maps of CTs in 1991 and 2001 have been prepared which also denotes the block-wise location of CTs. In 2001 (see Figure 9), only Barjora block was consist of two CTs i.e., Barjora and Beliatore with urban population of 11,512 and 5,654 respectively. But there were four NTs (not CTs) in Bankura district according to 1991 census data. The maximum number of urban populations was agglomerated in Khatra (13,265), followed by Barjora (9,554), Patrasayer (9,270) and Beliatore (4,745).

Figure 8: Block-wise spatial distribution of CTs in Bankura District using GIS tools in 1991

Figure 9: Block-wise spatial distribution of CTs in Bankura District using GIS tools in 2001

The present study has easily identified that, as an urban unit Barjora has a consistency and the urban population has been increased time to time in this CTs.

5. CONCLUSIONS

Urban population of an area can be increased in two ways, one is migration of rural population in the existing urban centre and secondly transformation of the rural areas in urban. Higher number of CTs indicates the transformation of the rural area into urban. The history of urbanisation in Bankura District is very older and also very stagnant. There are only three statutory i.e. municipal town namely Bankura, Bishnupur, Sonamukhi which are established in the early British period, late nineteenth century. Till now no statutory town has been established, that is why Bankura District has been called 'Death urban district' often. But according to 2011 census data there are nine CTs, so now Bankura District consists of twelve urban units.

The maximum number of CTs are belong to Barjora Block followed by Khatra. These two blocks add five CTs out of nine. Four blocks namely Kotulpur (Kotulpur), Raipur (Raipur Bazar), Chhatna (Jhanti Pahari) and Simlapal (Simlapal) have one CTs each. Rest sixteen blocks have no census towns. Barjora block contains three census towns namely Barjora, Beliatore and Ghutgarya and having total 25,786 population which share about 39% of total urban population (CTs) of the district.

But the history of emergence of NTs (not CTs) in Bankura district is very ancient, it started from the pre-independence period. From 1951 to 1981 the growth rate of NTs was zero as there was only two NTs in each census year namely Khatra and Patrasayer. In the year of 1991 two NTs were newly emerged in Barjora Block i.e., Barjora and Beliatore. According to 1991 census data, the non-statutory urban unit was called NTs in Bankura District. The census of India had given new and revised definition of non-statutory town as census town. It was the census year of 2001 for the first time where CTs had been emerged in Barjora Block as well as Bankura District. In number it was only two namely Barjora and Beliatore and census data of 2011 adds new seven census towns in the district. Bankura District has a higher share of income from secondary and tertiary sector but it is concentrated in industrial and urban complex area so the remaining urban zones are still remaining backward. Therefore, it can be concluded that as the new urban area is under panchayat so municipalization of the CTs have to be rapid otherwise rapid spread of unplanned CTs lead to chaotic urbanization in the entire district.

6. ACKNOWLEDGEMENTS

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