Article

Spatial Perspectives of the New Census Towns, 2011: A Case Study of West Bengal

Debarshi Guin[1]
Dipendra Nath Das[2]

Abstract

This detailed geographical analysis of the emergence of new census towns in 2011 reveals that, broadly, the spatial pattern of the new census towns follows the pattern of the existing urban centres. As a result, the force of urban concentration has been further accentuated. Quite expectedly the field of urban concentration around Kolkata urban agglomeration has been extended outward, which indicates the perpetuating centripetal force of the declining metropolis. Apart from this age-old location of urban concentration, several new pockets of urban concentration have emerged, of which the majority are centred by the small and medium cities with great regional and national importance. Contrary to the force of urban concentration, emergence of new census towns also resulted in, albeit to a limited extent, urban dispersal. The study concludes that, to make this emerging organization of space significant, it is necessary to have an effective urban governance and planning in the newly emerged (as well as existing) census towns.

2011新普查城镇的空间展望：以西孟加拉邦为例

本文通过详细的地理分析揭示了，2011年出现的新普查城镇的空间格局总的来说仍然沿用了现有的城市中心布局模式。其结果是，城市集中力得到了进一步的加强。不出意料的是，加尔各答城市群周边的城市集中区域已经向外扩展，这表示衰退中的大都市仍然延续了向心力。除了这种长久以来的城市向心性的区位，一些新型的小规模城市集中趋势逐渐涌现，其中大部分是以在地区和国家具有较大重要性的中小城市为中心的。与城市向心力相反，新普查城镇的出现也导致了城市分散，尽管是在有限的范围内，城市分散在国家内部和城市化程度非常低的地区的城市图景中具有巨大的潜力。本研究的结论是，要增强这种新兴的空间组织方式的重要性，就必须保证在新兴（以及现有的）的普查城镇中具备有效的城市治理和城市规划。

Keywords

New census towns, spatial concentration, spatial deconcentration, new pockets of urban concentration, urban governance

[1] Research Scholar, Centre for the Study of Regional Development, School of Social Sciences, Jawaharlal Nehru University, New Delhi.
[2] Associate Professor, Centre for the Study of Regional Development, School of Social Sciences, Jawaharlal Nehru University, New Delhi.

Corresponding author:
Dipendra Nath Das, Associate Professor, Centre for the Study of Regional Development, School of Social Sciences, Jawaharlal Nehru University, New Delhi–11067.
Email: dipendra02@gmail.com

Introduction

In comparison to other developing regions of the world, India's urbanization is exceptionally top-heavy in nature (Kundu, 2014), where around 43 per cent of the urban population live in 52 million-plus cities/urban agglomerations (UAs) only. Although this top-heavy pattern of urbanization was inherited from colonial India, it has been nurtured in the post-independence period by the large city biased urban policies and programmes. As a result, employment opportunities have become polarized leaving the seas of rural areas. Of late, the Twelfth Five-Year Plan (2013) has recognized the need for a spatially balanced urbanization, which will enhance the connection between rural and urban areas. Studies (Rondinelli, 1983; Tacoli, 1998) suggest that the small urban centres play a crucial role in bridging this connection. Fortunately, the 2011 census has marked the unprecedented emergence of new census towns (CTs), which are small in size and until recently there was a severe shortage of such urban centres in India's urban scenario (Kundu, 1992, p. 16) until 2011. In 2011, the number of CTs had increased by 2,774, which outstrips the total addition of such towns in the whole twentieth century (Kundu, 2011). Initially, there was a belief that this startling increase of CTs might be artificially inflated by the census authority because none of the projections of urban growth implied such an increase (Kundu, 2011) but subsequent studies (Bhagat, 2012; Guin & Das, 2015; Pradhan, 2013) have proved that there was no such activism by the census authority. Therefore, it is imperative to study these newly emerged CTs from a geographical perspective because if these towns emerged in a decentralized manner then it could have an enormous significance towards creating the much-needed spatially balanced urban system.

The plan of this article is as follows. Following this introductory section, the second section justifies the selection of the West Bengal state for the case study. The concept of new CT has been discussed in the third section. The fourth section gives an overview of emergence of new CTs in West Bengal in the past three decades. The level of concentration of the new CTs of 2011 around the existing towns has been estimated in the fifth section. The sixth section identifies the factors influencing the spatial distribution of the new CTs. The last section summarizes the main findings and gives policy suggestions.

Why West Bengal?

If we consider the number of new CTs in 2011 as one can see from Table 1, the first six states (West Bengal, Kerala, Tamil Nadu, Uttar Pradesh, Andhra Pradesh and Maharashtra) constitute more than 60 per cent of the new CTs but with respect to their density and share to the decadal urban growth (2001–2011), Kerala and West Bengal are much ahead than the others. From the perspective of settlement system, in Kerala 'the rural-urban division is blurred, and the towns are small while the villages are large' (Dasgupta, 2000, p. 221). Top-heavyness is also not an issue here as most of the towns are small and medium in size. Thus in Kerala, the emergence of so many new CTs hardly has any significance from the perspective of organization of space and hierarchal pattern of urban centres. However, in West Bengal (Figure 1), these new CTs have a huge spatial implication as here the rural–urban divide is more common rather than rural–urban continuum and the majority of small and medium urban centres are concentrated around a few large cities. While, according to the 2001 census, Kolkata UA (one of the two metropolises of the state) alone constituted 33 per cent urban centres (and 59 per cent urban population) of the state, in the rest of the state, especially the western (Paschim Medinipur, Bankura, Purilia and Birbhum) and northern parts (except Darjeeling and Jalpaiguri), on an average, there is less than one town per 100 square kilometre of area. Recognizing this spatially unbalanced and 'mono-centric' pattern of urbanization in the state, Dasgupta (1987) and Giri (1988, p. 108) put forward a strategy of decentralized urbanization through emergence, growth and development of small urban centres in adequate quantity away from the

Table 1. Emergence of New CTs (2011) and Their Impact on Decadal Urban Growth

State	No. of New CTs	Density of New CTs*	Share of New CTs to Decadal Urban Growth (2001–2011)**
West Bengal	537 (541)	6.05	70.07
Kerala	362 (362)	9.31	97.69
Tamil Nadu	272 (272)	2.09	39.5
Uttar Pradesh	208 (217)	0.86	21.84
Maharashtra	171 (178)	0.56	20.68
Andhra Pradesh	159 (178)	0.58	27.03
Jharkhand	107 (109)	1.34	44.89
Gujarat	106 (147)	0.54	12.9
Karnataka	94 (98)	0.49	13.48
Assam	86 (94)	1.1	62.2
Orissa	86 (86)	0.55	37.6
Rajasthan	80 (80)	0.23	22.04
Madhya Pradesh	64 (90)	0.21	11.85
Punjab	60 (67)	1.19	24.64
Bihar	56 (73)	0.59	17.37
Haryana	52 (63)	1.18	18.71
Jammu & Kashmir	33 (47)	0.15	29.26
Chhattisgarh	10 (113)	0.07	4.34

Source: Census of India, 2001 and 2011.
Notes: Figures in the parentheses represent total number of new towns (new CTs + new STs) in 2011.
    *= Number of new CTs per 1,000 sq. km area.
    **= New CTs that have been graduated from earlier (2001) outgrowths have been excluded.

Kolkata UA. In 2011, there was an unprecedented increase of new CTs in the state and in tandem inequality in urbanization reduced considerably (Guin, 2014, pp. 36–37). Density of towns increased in the previously mentioned western and northern districts, and percentage share of Kolkata and Asansol metropolis to total urban population of the state was down to 52.71 per cent in 2011 from 63.64 per cent in 2001.[1] From these initial results, it seems that the new CTs result in urban dispersal rather than urban concentration. However, the actual pattern of spatial distribution of these towns is more complex rather than simple, which is the focal theme of this article.

In this backdrop, the study has two objectives—first, to analyze the spatial distribution of the new CTs of 2011 and second, to find out the factors that control this distribution. The Census 2001 and 2011 are the main data source for the whole study.

Concept of New CT

A new town is one that did not have the status of an urban settlement in the previous census and if that new town is a CT then it can be termed as a new CT (NIUA, 1988, p. 32). Thus, new towns include both new CTs and new statutory towns (STs), although in most of the states, the majority of new towns
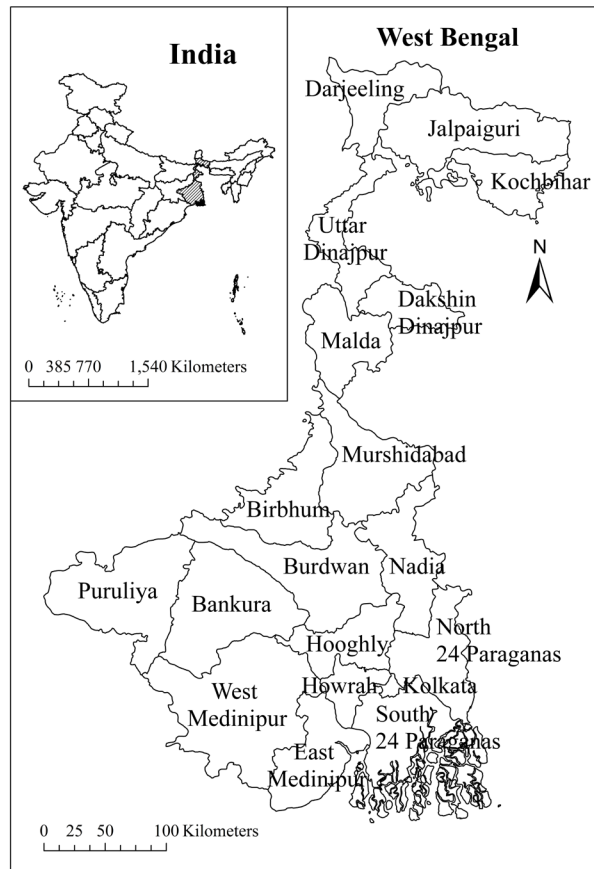
Figure 1. Location of West Bengal and Its Administrative Divisions (Districts)
Source: Authors' own.

are new CTs (Table 1). Here it is important to note that the new CTs, the graduated form of earlier villages, are identified prior to the population enumeration of current census and hence the identification is done by applying some specified demographic and workforce-related criteria[2] to all the villages of the previous census.

Emergence of New CTs

A thorough review of the data presented in Table 2 reveals that from 1981 to 2001, there was no major change in the spatial pattern of the emergence of new CTs. The majority of the newly emerged CTs were concentrated in the five districts that share Kolkata UA. In addition to these, a good number of new CTs also belonged to the Burdwan district, which is both industrially and agriculturally developed. On the contrary, all the districts in the north and western part (including Birbhum) of the state had an insignificant contribution to the total number of new CTs that emerged in these census years. This pattern

Table 2. Distribution of New CTs

District	1981	1991	2001	2011
Darjeeling	4	2	1	21
Jalpaiguri	3	3	4	23
Cooch Behar	0	2	1	8
Uttar Dinajpur	1	0	1	3
Dakshin Dinajpur			0	5
Malda	2	2	3	24
Murshidabad	2	6	12	43
Birbhum	1	0	1	13
Burdwan	27	21	24	33
Nadia	4	11	5	40
Hooghly	10	10	12	38
Bankura	0	2	0	7
Purulia	1	2	2	16
Howrah	7	16	14	85
North 24 Paraganas	14	13	11	58
South 24 Paraganas		18	6	97
Paschim Medinipur	2	3	5	7
Purba Medinipur				16
Total	78	111	102	537

Source: Census of India of various years.

was quite resembled with the 'mono-centric' spatial pattern of urbanization where Kolkata UA had monopolistic control over the entire gamut of urbanization of the state as mentioned earlier. However, quite interestingly district-wise distribution of new CTs in 2011 shows some important changes amidst the continuity of earlier trend (Figure 2). As usual, the five districts[3] sharing Kolkata UA continue to be the focal area of concentration of the majority of the new CTs. These five districts shared 44.87 per cent, 61.26 per cent and 47.12 per cent of new CTs in 1981, 1991 and 2001, respectively, and this measure has increased (as compared to 2001) to 59.15 per cent in 2011. While the concentration of new CTs has been perpetuating in these five districts, in 2011, for the first time the districts of the northern and western parts of the state have also recorded a good number of new CTs. Among these districts, Darjeeling, Jalpaiguri and Malda are located in northern West Bengal, where the increase of new CTs in comparison to previous census years is really impressive. Spatial distribution of the newly emerged CTs in Darjeeling clearly reveals that the majority of them are located near the two very important fast growing cities—Siliguri and Darjeeling. Therefore, it is obvious that in the case of Darjeeling, the influence of the existing cities was one of the major reasons behind the processes of transformation of the villages that graduated to CTs. Unlike Darjeeling, in Jalpaiguri, most of the new CTs are scattered across the district. Here it is important to note that the district's economy hinges on tea plantation, which is a primary activity. Therefore, an in-depth study of local economic dynamics is required to know whether the transformation of the concerned villages was guided by growth and development of tea plantations activities or
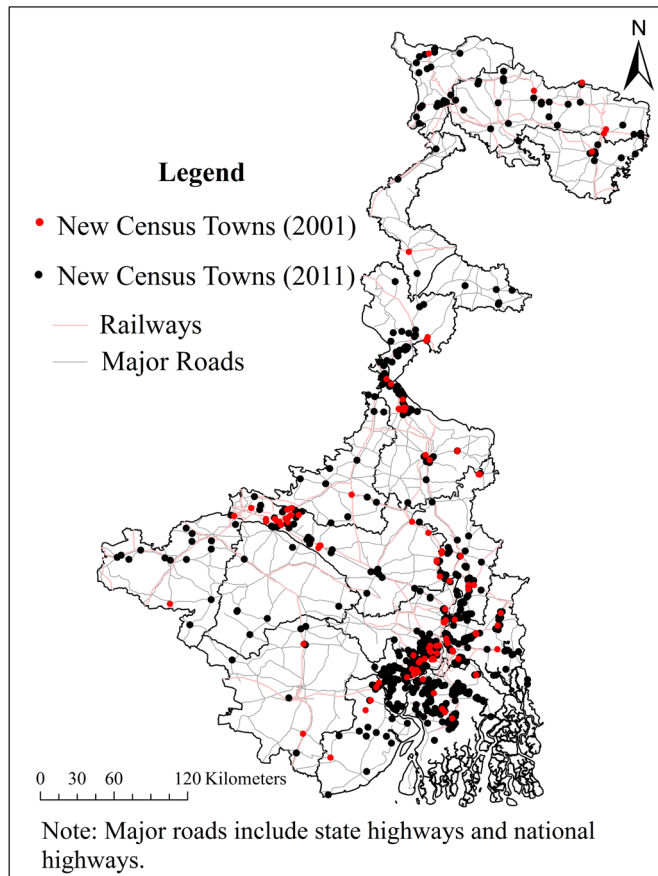
Figure 2. Spatial Distribution of the New CTs of 2001 and 2011
Source: Authors' own.

because of decline of plantation activities. Quite interestingly, in Malda, most of the new CTs have emerged in an agglomerated form in the southern part of the district where there is no existing urban centre in the vicinity. According to Chatterjee (2013a), transformation of villages in this agglomeration was possible by the spread of silk and *bidi* industry in this region from Murshidabad. Although Chatterjee's (2013b, pp. 112–113) field study in Chaspara (one of the 13 new CTs in this area) argues that the transformation of the villages in this region was guided by rapid conversion of agricultural land into residential use as farmers affected by very low demand of agricultural products (silk) and sociopolitical instability sold off their agricultural land to outside builders and finally out-migrated (or engaged in illegal activities).

In the districts of the western part of the state (Birbhum, Purulia, Bankura, Paschim Medinipur and Purba Medinipur) the number of new CTs has increased significantly in 2011, although the total number of new CTs in that part is much lesser than the districts of the northern part. In 2011, around 11 per cent new CTs belonged to these western districts while it was below 1 per cent in the previous three census years (2001, 1991 and 1981). The pattern of location of the new CTs as revealed from Figures 2 and 3 indicates that the majority of them have emerged in a dispersed manner with comparatively greater

distance from the existing urban centres and almost all occupy nodal location. Such type of a locational pattern indicates the in situ process of settlement transition from rural to urban (Denis, Mukhopadhyay & Zerah, 2012).

Spatial Concentration versus Spatial Dispersion

According to Bala (1982), there are two major spatial forms of emergence of new CTs—concentration of new CTs near the large urban centres and dispersed form of emergence in the developing backward regions. Earlier studies (Dasgupta, 1988, pp. 70–72; Jatrana, 1986, p. 84; Kundu, 1992, p. 15; Prasad, 1984, p. 169; Premi, 1974; Sengupta, 1997. p. 38) reveal that at the all-India level as well as in West Bengal, new CTs of the past census years were excessively concentrated around the metropolises or (and) within the large UAs. For the current census (2011), on the basis of buffer approach around existing class I cities (population size 0.1 million and above), Pradhan (2013) has studied the level of concentration of new CTs of 2011, and it reveals a marked departure from the previous trends as only around two-fifths of the new CTs are concentrated adjacent to the existing class I cities. However, this estimate is far from complete as it does not take into account the new CTs that are concentrated close to the existing small and medium towns with a population size below 0.1 million. Thus, the question that remains is: With reference to the emergence of new CTs, which spatial form (concentration or dispersion) dominates? What is the scenario with respect to the concentration of new CTs around the existing towns of different size classes?

Here, following the same approach as used by Pradhan (2013), we have made an effort to provide a comprehensive estimate of the new CTs of West Bengal that have emerged in the vicinity of existing urban centres of different size classes. First of all, three buffers have been drawn around each existing urban centre on the basis of their size class (radii of the buffers are given in Table 3) as per Census 2001, then locations of the new CTs have been plotted on the map. The new CTs, which are included in the buffers, are considered as proximate to existing towns. These are termed as 'suburban' new CTs while those are outside the buffers can be termed as 'subaltern'[4] new CTs. Some new CTs lie within the buffer areas of existing towns of multiple size classes and in such cases concerned new CTs are

Table 3. Radii of the Buffers

Size Class of the Existing Cities/Towns	Radii of the Buffers (in km)		
	Case I (Base)	Case I (+25%*)	Case III (–25%**)
More than 40,00,000	25	31.25	18.75
40,00,000–10,00,000	20	25	15
9,99,999–4,00,000	15	18.75	11.25
3,99,999–1,00,000	10	12.5	7.5
99,999–50,000	7	8.75	5.25
49,999–20,000	5	6.25	3.75
Below 20,000	3	3.75	2.25

Source: Authors' selection.
Notes: *Radii are 25% larger than the base (Case I), **Radii are 25% smaller than the base.

considered within the buffer areas of existing towns of higher size classes. It is worth mentioning that this method suffers from the following shortcomings: (i) each town/city has its unique shape hence a circular buffer around it does not fit properly, (ii) different towns/cities in the same size class do not have same area of influence around them, and (iii) towns/cities with exactly the same population size but located in different regions or with a different socio-economic character do not necessarily have an equal area of influence around them. In fact, these lacunas do not affect the estimate seriously as we deal with a sufficiently large number of towns.

According to the base estimate (Table 4 and Figure 3), 66.48 per cent of new CTs have suburban location. Size class-wise break-up reveals that according to the base estimate, 18.44 per cent of total new CTs are located under the buffer area (Table 3) of Kolkata (the only city in the size class of more than 4 million). Therefore, while a total of 66.48 per cent of new CTs have emerged near the existing urban centres of 2001, 27.73 per cent of them are near to Kolkata only. Unlike Kolkata, the surrounding areas of Howrah (i.e., size class—3.99 million to 1 million) share only 1.86 per cent of new CTs (and 2.80 per cent of suburban new CTs). As Kolkata is located just next to Howrah, many of the new CTs within the buffer of the latter have already come under the buffer of the former. Apart from Kolkata and Howrah, the buffer area of the cities with 0.99 million to 0.4 million population (Asansol, Durgapur, Siliguri and Bhatpara are included in this size class) share 6.89 per cent of all the 537 new CTs (and 10.36 per cent of total suburban new CTs). Therefore, the buffers of the six largest cities constitute 27.19 per cent of all the new CTs and 40.90 per cent of all suburban new CTs. The next size class of the cities is from 0.399 million to 0.1 million, buffer areas of which are recorded with 17.13 per cent of the new CTs and 25.77 per cent of the suburban new CTs. Here it is important to note that in 2001, there were 52 cities in this size class of which most are district headquarters and many regionally important cities, such as, Kharagpur, Haldia and Chandannagar. Thus, buffer areas of all the class I cities (population size 0.1 million and above) share 44.32 per cent of the total new CTs and 66.67 per cent of suburban new CTs. The buffers around the medium towns (i.e., size class of 0.099 million to 0.05 million) constitute 8.38 per cent of new CTs and 12.61 per cent of suburban new CTs. There were 29 towns in this size class. The next size class is 0.0499 million to 0.02 million and the buffers around the towns of this size class share 7.64 per cent of new CTs and 11.48 per cent of the suburban new CTs. There were 56 towns in this size class. The buffer areas of last size class (below 0.02 million) constitute 6.15 per cent of new CTs and 9.24 per cent of suburban new CTs. There were 231 such towns that were mostly rural market towns and residential

Table 4. Proximity of New CTs to Existing Cities/Towns of Different Size Classes

Size Class of the Existing Towns/Cities	Case I (Base)	Case II (+25%)	Case III (–25%)
More than 40,00,000	99 (18.44)	158 (29.42)	42 (7.82)
40,00,000–10,00,000	10 (1.86)	0 (0)	12 (2.23)
9,99,999–4,00,000	37 (6.89)	47 (8.75)	27 (5.03)
3,99,999–1,00,000	92 (17.13)	82 (15.27)	90 (16.76)
99,999–50,000	45 (8.38)	40 (7.45)	38 (7.08)
49,999–20,000	41 (7.64)	44 (8.19)	34 (6.33)
Below 20,000	33 (6.15)	24 (4.47)	44 (8.19)

Sources: Census of India, 2001 and 2011; Google earth images.
Note: Figures in the parentheses represents the percentage of new CTs within the area of the buffers.
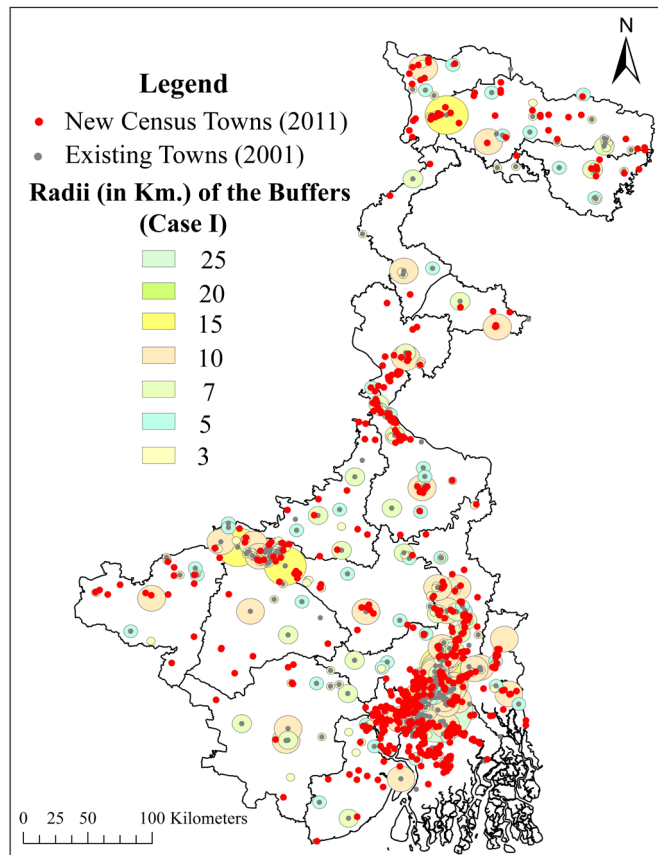
Figure 3. Proximity of New CTs (2011) to the Existing Towns
Source: Authors' own.

towns in the suburbs of big cities. It is important to note that majority of new CTs that have appeared within the buffers of the towns of last two size class categories are mainly the result of extension of these already existing small towns.

This section examines how the percentage of suburban new CTs changes with the increase and decrease of areas under the buffers (Tables 3 and 4).It is evident from Table 4 that for Kolkata (size class more than 4 million) a 25 per cent increase in the radius of the buffer from the base radius percentage of suburban new CTs increases to 29.42 from 18.44 (as per base estimate) while the same decreases to 7.82 if we reduce the radius by 25 per cent than that of base radius. Therefore, it can be said that with the increasing distance from the city centre, the number of suburban new CTs decreases more or less evenly. This implies the strong impact of Kolkata on the new CTs around it. A similar type of result has also been found for the size class category of 0.99 million to 0.4 million. On the contrary, for the size class of 0.0499 million to 0.02 million, with increase in the area of buffers, the proportion of new CTs within them increases at a declining rate, which as indicated earlier, implies that most of the new CTs within the buffers are very close to the existing towns. This is because of the fact that in

most of the cases, the impact of the small towns is limited to their immediate surroundings only. Table 4 also reveals that for some of the size classes, as the area of buffers increases the number of new CTs within them decreases. This anomaly is due to the fact that when the area of buffers increases many new CTs within the buffers come under the domain of the buffers of the cities/towns of comparatively higher size class categories. This type of anomaly is most common for the towns of lower size class category within the Kolkata UA and other UAs where small towns are located very close to the large cities/towns.

In a nutshell, base estimate reveals that 66.48 per cent of new CTs are in the proximity of the existing urban centres while it decreases to 53.46 per cent and increases to 73.56 per cent for the case III (–25 per cent) and case II (+25 per cent) estimates respectively. Therefore, whatever estimate we consider there is no doubt that if not all, more than half of the new CTs are concentrated near the existing urban centres.

However, we cannot underestimate the force of urban de-concentration as at least more than 25 per cent or 142 new CTs (case II [+25 per cent]) have 'subaltern' location, which is more than the total number of new CTs in 2001. Most of the new CTs in Bankura, Purulia, Paschim Medinipur, Purba Medinipur, Birbhum, Uttar Dinajpur, Dakshin Dinajpur and Jalpaiguri are of this type (Table 5).

From this detailed analysis about the spatial pattern and the locational attribute of the new CTs of 2011, one thing is clear that two opposing forces have been strengthened by these new CTs. One is

Table 5. New CTs and Proximity to Existing Towns

District	Case I (Base)	Case II (+25%)	Case III (–25%)
Darjeeling	15 (71.43)	16 (76.19)	11 (52.38)
Jalpaiguri	6 (26.09)	7 (30.43)	5 (21.74)
Cooch Behar	5 (62.50)	5 (62.5)	4 (50)
Uttar Dinajpur	0 (0)	0 (0)	0 (0)
Dakshin Dinajpur	3 (60.00)	3 (60.00)	3 (60.00)
Malda	7 (29.17)	9 (37.5)	5 (20.83)
Murshidabad	39 (90.70)	40 (93.02)	29 (67.44)
Birbhum	3 (23.08)	3 (23.08)	3 (23.08)
Burdwan	31 (93.94)	31 (93.94)	26 (78.79)
Nadia	33 (82.5)	35 (87.5)	30 (75)
North 24 Paraganas	50 (86.21)	52 (89.66)	47 (81.03)
Hooghly	32 (84.21)	35 (92.11)	25 (65.79)
Bankura	1 (14.29)	1 (14.29)	0 (0)
Purulia	6 (37.5)	9 (56.25)	6 (37.5)
Purba Medinipur	3 (42.86)	3 (42.86)	2 (28.57)
Paschim Medinipur	7 (43.75)	7 (43.75)	5 (31.25)
Howrah	57 (67.06)	65 (76.47)	42 (49.41)
South 24 Paraganas	59 (60.82)	74 (76.29)	44 (45.36)
West Bengal	357 (66.48)	395 (73.56)	287 (53.45)

Sources: Census of India, 2001 and 2011 and Google earth images.
Note: Figures in the parentheses represents the percentage of new CTs within the area of the buffers.

Table 6. Distribution of New CTs Located within the UAs

Size Class of the UA	2001		2011	
	No. of UA	No. of New CTs within the UA	No. of UA	No. of New CTs within the UA
10,00,000 and more	2	20	2	18
10,00,000–5,00,000	0	0	2	6
4,99,999–2,50,000	1	0	6	18
2,49,999–1,00,000	12	5	15	38
below 1,00,000	5	3	13	23
Total	20	28	38	103

Sources: Census of India, 2001 and 2011.

spatial concentration of urban centres and the other is spatial de-concentration of urban centres. Here it is important to note that the new pattern of spatial concentration of new CTs is somewhat different as compared to the old pattern of 'mono-centric' concentration. From Table 6, it is evident that while in 2001, there were only five new CTs within the 13 UAs with population size ranging from one below 1 million to 0.1 million, it has increased to 62 new CTs within 23 UAs in 2011. In fact, there are 10 new UAs in 2011 with a population size of more than 0.1 million and a majority of the constituent urban centres of these new UAs are new CTs of 2011. What is more important is seven out of these 10 new pockets of urban concentration are away from Kolkata UA and centred by small and medium cities of regional and national importance, such as, Siliguri, Durgapur and Burdwan.

Factors Controlling the Spatial Distribution

From Table 5 it is clear that the majority of the new CTs are concentrated in the districts that surround Kolkata while the rest of the districts have comparatively fewer new CTs. To find out the most important factors that influence their spatial distribution stepwise (forward) regression has been done. According to this regression:

$$Y = \alpha + \beta_1 \chi_1 + u \ldots \text{(step 1)}$$

$$Y = \alpha + \beta_1 \chi_1 + \beta_2 \chi_2 + u \ldots \text{(step 2)}$$

$$Y = \alpha + \beta_1 \chi_1 + \beta_2 \chi_2 + \beta_n \chi_n + u \ldots \text{(step } n\text{)},$$

where Y is the dependent variable, α is the intercept, β is the slope, χ is the independent variable and u is the error term of the regression equation.

In this model, new CTs per 100 sq. km area (at the district level) as the dependent indicator (Y) while independent indicators are—number of big villages[5] per 100 sq. km area in 2001 (DBV), percentage of rural male workers engaged in non-farm activities in 2001 (RNF), percentage of rural male non-household industrial workers in 2001 (RNHI), percentage of rural male household industrial workers in 2001 (RHI), rate of urbanization in 2001 (UI), number of towns per 100 sq. km area in 2001 (TD), percentage of village connected by bus service in 2001 (BUS) and human development index (HDI) in 2001.[6]

Table 7. Results of Stepwise Regression Analysis (District Level)

Step	Variables	Regression Coefficient	S.E.	t	R^2	Increase of R^2	Adjusted R^2	F
1	TD	1.479	0.115**	12.876	0.917	–	0.911	165.784**
2	TD	1.198	0.147**	8.137	0.943	0.026	0.935	116.885**
	RHI	0.152	0.059*	2.561				
3	TD	0.765	0.236**	3.242	0.959	0.016	0.949	101.008**
	RHI	0.141	0.053*	2.673				
	RNHI	0.077	0.035*	2.204				

Sources: Census of India, 2001 and 2011.
Notes: **=Significant at 1% level ($P < 0.01$), *=Significant at 5% level ($P < 0.05$).

The results (Table 7) show that the density of existing towns (TD) explains the maximum variations (92 per cent) in the density of new CTs (Y), followed by percentage of rural male household industrial workers (RHI) and percentage of rural male non-household industrial workers (RNHI). In spite of the marginal increase of R^2 in step 2 and step 3, the corresponding adjusted R^2 has not decreased rather it increased in comparison to the previous step. Thus, it is pertinent to retain the indicators RHI and RNHI in the model. A continuous increase of adjusted R^2 also indicates that the relationship given in step 3 is the optimal fit. The rest of five indicators (DBV, RNF, UI, BUS and HDI) have no statistically significant influence to explain the variations of density of new CTs.

Therefore, from the above results, it is clear that more than 90 per cent variation in the dependent indicator is explained by the density of existing towns alone while the percentage of rural male household industrial workers and of rural male non-household industrial workers explain 2.6 per cent and 1.6 per cent, respectively, of the variation of the independent indicator. Thus, according to the results, it can be said that with the increase of density of existing town, the density of newly emerged towns also increases. From the spatial pattern of the new CTs we have seen that the districts (Nadia, North 24 Paraganas, Hooghly, Howrah and South 24 Paraganas) sharing the periphery of Kolkata UA have been reported with huge number of new CTs. Similarly, most of the already existing towns are also located in these districts. From the results, it is also clear that the level of urbanization (UI) has no significant explanatory power to the variations of new CTs density. This indicates two aspects—the influence of UI is already explained by TD and not only the big cities but also small and medium towns and small cities also have played an important role behind the emergence and location of new CTs. From the maps given in the Administrative Atlas of West Bengal—Census 2011, it is crystal clear that many new CTs are nothing but the extended part of the already existing small and medium towns. This has happened because of the spillover of these existing urban centres from their administrative boundary. Apart from the density of the existing towns, though less in degree but significant control of percentage of rural male household industrial worker and percentage of rural male non-household industrial worker over the variation of the density of new CTs are quite expected. Therefore, from the three statistically significant explanatory indicators it can be concluded that at the district-level spatial distribution of the new CTs is more controlled by the existing pattern of urbanization rather than rural industrial activities.[7] However, the results of this regression suffer from some serious shortcomings. As districts have been taken as a unit, there are only 17 observations that are fairly low for regression analysis. Moreover, maximum density of new CTs and existing towns and higher percentage of non-household rural industrial workers are found in the five districts (Nadia, Hooghly, Howrah, North 24 Paraganas and South 24 Paraganas) that

share the Kolkata UA. Thus, the results are very biased towards the conditions of these five districts only and hence another regression should be attempted that would be free from such biasness.

Therefore, to eliminate the above-highlighted shortcomings, in the second regression Community Development Blocks[8] (CD Blocks) have been taken as a unit and the CD Blocks on which Kolkata UA and Asansol UA (both are metropolis) are spread have been excluded from the analysis. Thus, this model is based on 321 observations.

Like the previous one, here also the dependent indicator is the number of new CTs per 100 sq. km area (Y_1) and the independent indicators are—number of big villages per 100 sq. km area in 2001 (DBV_1), percentage of rural male workers engaged in non-farm activities in 2001 (RNF_1), percentage of rural male household industrial workers in 2001 (RHI_1), rate of urbanization in 2001 (UI_1), number of towns per 100 sq. km area in 2001 (TD_1) and presence of city (class I) with a population size of 0.1 million or more in 2001 ($DUMMY_1$).

For the second regression, most of the independent indicators are similar to the previous one but due to the data constraint at the CD Block level the three indicators—RNHI, BUS and HDI—which have considered for first regression—have been dropped here. The only new indicator is the presence of the city with a population size of one lakh or more ($DUMMY_1$) which is a dummy indicator. It has been considered to capture the influence of the cities if any, where the assumption is CD Blocks with class I city/cities have a comparatively greater density of new CTs than those CD Blocks without any class I city. Another important note is that to work out the values of indicator UI_1 and TD_1, STs are also considered and in case one ST shares the boundary of two or more CD Blocks then this town has been counted for all the concerned CD Blocks while for working out the percentage of rural male non-farm workers, the workers who were engaged in forestry, fishing, plantation and related work have also been considered because of the unavailability segmented data of such type of workers at the CD Block level.

Unlike the first regression, the results of the second regression (Table 8) show that the percentage of rural male non-farm workers (RNF_1) explains the maximum variations (32 per cent only) in the density of new CTs (Y_1), followed by density of existing towns (TD_1) and rural male household industrial workers (RHI_1). The contribution of RHI_1 is however comparatively much lower in explaining the variations of the Y_1 as the increase of adjusted R^2 is marginal. Increase of the value of adjusted R^2 in step 2 and step 3 confirms that it is pertinent to retain the indicators TD_1 and RHI_1 in the model. The continuous increase of adjusted R^2 also indicates that the relationship given in step 3 is the optimal fit. The rest of three indicators (BDV_1, UI_1 and $DUMMY_1$) have no statistically significant influence to explain the variations of density of new CTs.

Table 8. Results of Stepwise Regression Analysis (CD Block Level)

Step	Variables	Regression Coefficient	S.E.	t	R^2	Increase of R^2	Adjusted R^2	F
1	RNF_1	0.070	0.006	12.354**	0.329		0.327	152.628**
2	RNF_1	0.055	0.006	9.533**	0.417	0.088	0.413	110.668**
	TD_1	0.330	0.048	6.813**				
3	RNF_1	0.050	0.006	8.444**	0.430	0.013	0.424	77.565**
	TD_1	0.321	0.048	6.681**				
	RHI_1	0.021	0.021	5.654**				

Sources: Census of India, 2001 and 2011.
Note: **=Significant at 1% level ($P < 0.01$).

From the results of the second regression (at CD Block level), it emerges that as the percentage of rural male non-farm workers increases, the density of new CTs also increases. This clearly indicates that in the case villages are located away from the metropolises, sectoral diversification is the most important pro-factor for their graduation from villages to towns.

The density of the already existing towns is the second most important indicator, an increase of which denotes the increase of density of new CTs too and interestingly, percentage of urban population (UI_1) has no significant role in explaining the variation of density of new CTs. It indicates that in the interior, low urbanized parts of the state, a good number of new CTs have come up in a contiguous manner with the existing small and medium towns. It is important to note that these new CTs are nothing but the result of spilling over of the existing small and medium towns beyond their administrative boundary and it also indicates a relatively static boundary of these existing towns.

The third significant indicator—percentage of rural male household industrial workers—positively controls the variations in the density of new CTs. Although its influence on the dependent indicator is very low it can still safely be remarked that in some predominantly rural and backward parts of the state, such as, south Malda, north Murshidabad, western parts of Purba Medinipur, Paschim Medinipur and Bankura, self-employment in household industries is one of the major ways for sectoral diversification in the villages which, on the other hand, plays a crucial role in the emergence of new CTs.

Conclusion and Policy Perspective

The analysis of the emergence of new CTs in 2011 leads to conclude that, broadly, the spatial pattern of the new CTs follows the pattern of the existing urban centres. As a result, the force of urban concentration has been further accentuated. Quite expectedly, the field of urban concentration around Kolkata UA has been extended outward, which indicates the perpetuating centripetal force of the declining metropolis.[9] Apart from this age-old location of urban concentration, several new pockets of urban concentration have emerged, of which the majority are centred by the small and medium cities with great regional and national importance. Indeed, small and medium cities have become vibrant enough to attract people to their peripheries. Contrary to the force of urban concentration, the emergence of new CTs also resulted in, albeit to a limited extent, urban dispersal which has a huge significance in the urban scenario of the comparatively less urbanized regions on the north and western parts of the state, which are far away from Kolkata UA and are not interspaced by any regionally important small or medium city.

Now the question that arises is: What is the real value of such a new pattern of urbanization fuelled by the growth of new CTs that have not been acknowledged with a statutory urban status? While the concerned settlements' (CTs) physical (land use) and economic character are no longer like a village, they are still governed by the rural panchayats, which do not have the capacity to provide and manage the key urban services. The study shows that the regionally and nationally important small and medium cities are growing rapidly. As a result, their peripheral villages are transforming to give birth to a bunch of new CTs that are not only the 'black hole' of urban services (particularly, water supply, drainage and solid waste management) but also here urban land-use regulations (unless covered by master plans) are not followed, which result into a chaotic pattern of peri-urban growth along with land speculation and other rent seeking activities. Therefore, on the one hand, administrative boundary of these important cities should be widened in tandem with their outward growth and the status of town panchayat may be given to the transitional settlements (read CTs) located beyond the municipal limit.

The study has further confirmed that there are many new CTs away from the important cities but contiguous with the existing CTs (small towns), which are nothing but the result of spilling over of the latter. It is true that in most of the cases none of the individual CTs are eligible for constituting an urban local body because their population size remains below 30,000[10] even though their economy is sound enough. However, in reality a small group of spatially contiguous CTs creates a single urban settlement that is easily eligible for municipal status as prescribed by the West Bengal Municipal Act, 1993, given that the towns have a sufficient economic base to run the functions of the proposed municipality. Therefore, while applying the act, one should consider the agglomerations of CTs as a single spatial unit.

However, in reality, local politics plays a crucial role in the decision of giving municipal status to the CTs (Samanta, 2012, p. 48). Evidence shows that there are municipalities with less than 30,000 population while hundreds of towns with a population size much higher than 30,000 remain as CTs only because of lack of political will. We are not prescribing to give statutory status to all the CTs but the process should be more transparent and politics free and the deserving settlements should be acknowledged with statutory status for making sense of this new pattern of urbanization in the state. In addition to that, panchayats should have well-thought-out land-use plans for the CTs to check haphazard built-up growth.

Notes

1. Apart from the emergence of a huge number of new CTs outside the UAs of Kolkata and Asansol, sluggish and/or declining growth of these UAs itself has also contributed to this considerable decrease of their percentage share in the total urban population of the state.
2. For 2011 census, the criteria were according to the 2001 census a village must have (i) at least a population size of 4,000, (ii) population density of 400 per square kilometre and (iii) a minimum 75 per cent male main workers engaged in non-agricultural activities. Census of India classifies 'worker' into two categories: main workers and marginal workers. Contrary to 'main workers', 'marginal workers' are defined as those workers who had not worked for major part of the year (i.e., less than 183 days/six months).
3. Kolkata UA is spread over six districts, namely, Nadia, North 24 Paraganas, Hooghly, Howrah, Kolkata and South 24 Paraganas. The core city of the UA—Kolkata Municipal Corporation—is itself a district (Kolkata).
4. The term 'subaltern' with respect to the process of urbanization was used by Denis et al. (2012) to mean autonomous transformation and growth of settlement agglomerations away from the important or large cities.
5. Population size 4,000 or more as per 2001 census.
6. The values of the district-wise HDI for 2001 have been collected from West Bengal Human Development Report (2004, p. 13). Here it should be mentioned that there is no separate value of HDI for Uttar Dinajpur and Dakshin Dinajpur, rather a single HDI value has been given for the earlier undivided district of Dinajpur. Therefore, we have applied this value for both the Uttar Dinajpur and Dakshin Dinajpur.
7. It must be noted that a higher percentage of rural workers engaged in non-household industrial activities does not always indicate rural industrialization because many rural people commute to the urban centres to work in the industry. However, it cannot be denied that the villages where higher percentage of workers engaged in non-household industrial activities were influence by the nearby industries.
8. Each district has several CD Blocks, which consist of many villages and CTs (if any).
9. In 2011, Kolkata city has experienced depopulation while the Kolkata UA has been growing at a declining rate.
10. As per the West Bengal Municipal Act, 1993, to get the status of municipality a settlement must have at least 30,000 or more population along with other criteria.

References

Bhagat, R. B. (2012). A turnaround in India's urbanisation. *Asia-Pacific Population Journal*, *27*(2), 23–40.
Chatterjee, M. (2013a). A preliminary discussion on the census 2011 results. *Urban India*, *33*(1), 175–191.

Chatterjee, S. (2013b). *Census towns in West Bengal: Its spatial spread and implications*. Unpublished M.Plan. Dissertation. Ahmedabad: Faculty of Planning and Public Policy, Centre for Environmental Planning and Technology University.

Dasgupta, B. (1987). Urbanisation and rural change in West Bengal. *Economic and Political Weekly*, *22*(8), 337–344.

———. (2000). Contrasting urban patterns: West Bengal, Punjab and Kerala. In A. Kundu (Ed.), *Inequality, mobility and urbanisation: China and India* (pp. 219–256). Delhi: ICSSR and Manak Pub. Pvt.

Dasgupta, B., Giri, P., Bhattacharyya, A., Bhattacharyya, A., & Basak, N. (1988). Measure of urban concentration in West Bengal. In B. Dasgupta (Ed.), *Urbanization, migration and rural change: A study of West Bengal* (pp. 68–98). Calcutta: A. Mukherjee & Co. Pvt. Ltd.

Denis, E., Mukhopadhyay, P., & Zerah, M.-H. (2012). Subaltern urbanisation in India. *Economic and Political Weekly*, *47*(30), 52–62.

Giri, P. (1988). An analysis of the growth of small and medium towns in West Bengal, 1951–1981. In B. Dasgupta (Ed.), *Urbanization, migration and rural change: A study of West Bengal* (pp. 99–122). Calcutta: A. Mukherjee & Co. Pvt. Ltd.

Guin, D. (2014). *Emergence of new towns and their nature: A multidimensional study of the new census towns of West Bengal, 2011*. Unpublished M.Phil. Dissertation. New Delhi: Centre for the Study of Regional Development, Jawaharlal Nehru University.

Guin, D., & Das, D.N. (2015). New census towns in West Bengal: 'Census activism' or sectoral diversification? *Economic and Political Weekly*, *50*(14), 68–72.

Human Development Report (2004). Development and Planning Department. West Bengal: Government of West Bengal.

Jatrana, S. (1986). *Emergence of new towns in India: A spatio-temporal analysis*. Unpublished M.Phil. Dissertation. New Delhi: Centre for the Study of Regional Development, Jawaharlal Nehru University.

Kundu, A. (1992). *Urban development and urban research in India*. New Delhi: Khama Publishers.

———. (2011). Method in madness: Urban data from 2011 census. *Economic and Political Weekly, 46*(40), 13–16.

———. (2014). Exclusionary growth, poverty and India's emerging urban structure. *Social Change*, *44*(4), 541–566.

NIUA. (1988). *State of India's urbanisation*. New Delhi: National Institute of Urban Affairs.

Pradhan, K.C. (2013). Unacknowledged urbanisation: New census towns of India. *Economic and Political Weekly, 48*(36), 43–51.

Prasad, B. (1984). *A spatial analysis of the recent trends and patterns of urbanisation in the state of Uttar Pradesh*. Unpublished M.Phil. Dissertation. New Delhi: Centre for the Study of Regional Development, Jawaharlal Nehru University.

Premi, M.K. (1974). Regional pattern of growth of new towns in India during 1961–71. *Demography India*, *3*(2), 254–265.

Rondinelli, A.D. (1983). Towns and small cities in developing countries. *Geographical Review*, *73*(4), 379–395.

Samanta, G. (2012). In between rural and urban: Challenges for governance of non-recognized urban territories. In N.C. Jana (Ed.), *West Bengal: Geo-spatial issues* (pp. 44–57). Burdwan: Department of Geography, The University of Burdwan.

Sengupta, P. (1997). *Emergence of new towns in India: A spatio-temporal analysis*. Unpublished Ph.D. Thesis. New Delhi: Centre for the Study of Regional Development, Jawaharlal Nehru University.

Tacoli, C. (1998). Rural-urban interaction: A guide to the literature. *Environment and Urbanisation*, *10*(1), 147–166.