

**Growth and Pattern of Urbanisation : An Analysis of Barasat  
Subdivision, North 24 Parganas, West Bengal.**

**ABSTRACT**

Urbanisation is one of the most significant development process affecting the modern world particularly the developing countries. However often the pattern and level of urban development are highly variable both spatially and temporally. Barasat subdivision comprises the sadar subdivision of the district of North 24 Parganas in West Bengal. This district traditionally has a glorious history of urbanisation being much higher than both the state and national averages. Within the district, this subdivision has shown a slow and steady growth of urbanisation since independence. Although the percentage of urban population has remained below the district average it has been significantly higher than the state and national average.. The study aims to find out the trends, levels of urbanisation and spatio-temporal pattern of urbanisation in the study area using quantitative and qualitative techniques. Mostly secondary data sources have been used. The study reveals that there are significant spatio-temporal variation in levels of urbanisation within the subdivision. The subdivision was overshadowed in the urban scenario mainly due to the overwhelming presence of neighbouring Barrackpore subdivision till 1981. The situation has significantly altered after Barasat being declared the district headquarter in 1986.

**KEY WORDS:** Level of urbanisation, urban spacing, urban population density

**1. INTRODUCTION**

Urbanization refers to an increase in the size of urban places and growth in the number with increasing concentration of population in such places (Hauser,M.P.and Duncan,O.D, 1954) . The phenomena of high level of urbanization at the global level specially in the developing countries is relatively a recent phenomena and has gained unprecedented momentum since the 1950's. By 2050, it is predicted that 64% of the developing world and 85.9% of the developed world would be urbanized (The Economist, 2012). Towns and cities in the third world are growing much more quickly than cities like London,Paris and New York did during and after the Industrial Revolution in the 18<sup>th</sup> and 19<sup>th</sup> centuries. This is giving rise to an urban explosion in the Third World.(Potter,R,1992)

Urbanization in India has shown remarkable progress particularly in the post –independence period. Urban population has increased from 10.84% in 1901 to 17.29% in 1951 to about 31.16% in 2011(Census of India, 2011). With 377.16 million urban people, India is the second largest urban

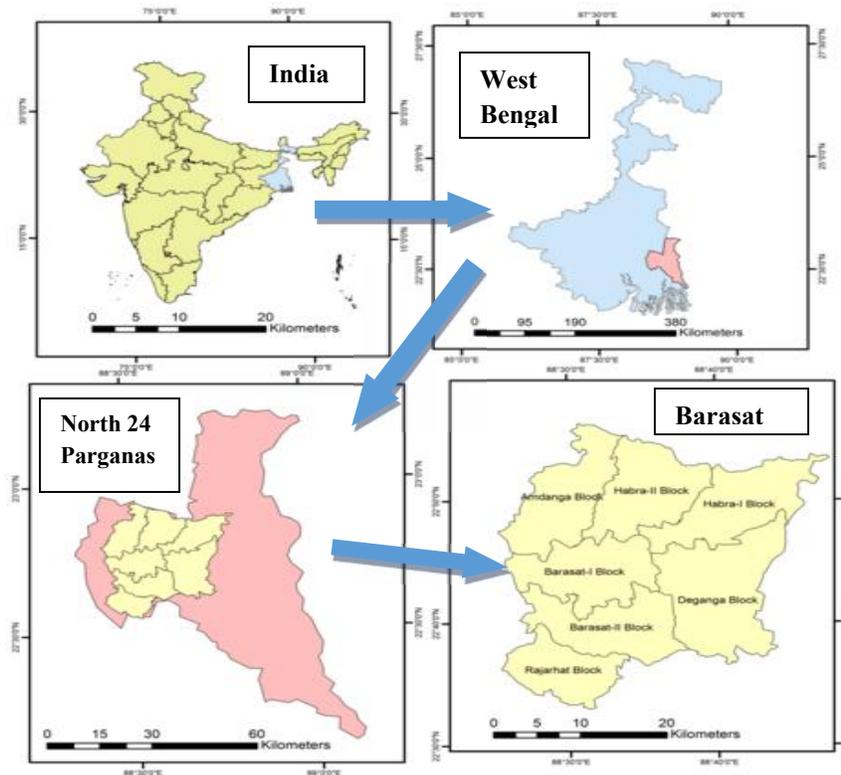
34 populated country and shares 11% of world's urban population and it is expected to increase by 13% by  
35 the year 2030 (Ministry of Housing and Urban Poverty Alleviation, MHUPA, 2016). With dwindling job  
36 opportunities, vagaries like drought, flood, fluctuating crop price in agricultural sectors, urban centres  
37 have served as magnet for attracting rural crowd. The situation is identical in the study area, Barasat  
38 subdivision. Urban growth, often unplanned, is taking a toll on the physical and socio-economic  
39 environment of the urban areas. Hence it is pertinent to understand and analyse the spatio-temporal  
40 growth of urban population in an area in order to examine its effects. Although many studies on the  
41 urbanisation process in the district of North 24 Parganas has been taken up, few has been carried on  
42 this subdivision. The subdivision, being the sadar division, has shown significant increase in urban  
43 population in the last century although spatial variations do exist within the subdivision. Hence a study  
44 of the dynamics of urbanisation in this subdivision has been attempted. The present study aims to  
45 provide an insight into the temporal and spatial dimensions of change in the urbanization pattern in this  
46 area in the last seven census decades. The study aims to provide a strong base and bridge the  
47 knowledge gap and pave way for further research for a more balanced and sustainable growth of urban  
48 development in the study area without adversely affecting the environment.

## 49 **2. STUDY AREA**

50 Barasat subdivision constitutes an important part of North Twenty parganas. The district headquarter,  
51 Barasat, is located in the study area. The latitudinal extent is from  $22^{\circ} 32' 21''$  N to  $22^{\circ} 57' 36''$  N  
52 while the longitudinal extent is from  $88^{\circ} 25' 40''$  E to  $88^{\circ} 48' 29''$  E. In the south, lies parts of  
53 Bidhannagar subdivision of North 24 parganas and Baruipur subdivision of South 24 parganas while  
54 the northern boundary is flanked by Nadia district. The blocks of Gaighata, Baduria, Bashirhat and  
55 Haroa form the eastern boundary while Barrackpur subdivision forms the western boundary. The  
56 total area of the subdivision is 1002.48 Sq. Kilometers with a population of 2,789,611 (Census 2011).  
57 It is well connected by road and railways. A project regarding further extension of the Metro services  
58 to the towns of Barasat in the near future is under construction. Figure 1 shows the location map of  
59 the study area.

60 The study area consists of six municipalities namely Barasat, Habra, Rajarhat Gopalpur, Ashoknagar,  
61 Kalyanagar, Madhyamgram and Gobardanga. It has seven Community Development (C.D.) blocks:  
62 Barasat-I, Barasat-II, Amdanga, Deganga, Habra-I, Habra-II and Rajarhat. These seven blocks

63 contain eight census towns and 58 gram panchayats. The subdivision has its headquarters at Barasat.



64  
65 **FIGURE 1:** Location of study area.

66  
67 **3. OBJECTIVES-**

68 The objectives of the study are-

- 69
- 69 • Analyse the trends and patterns of urbanization in the subdivision in the post-independence  
70 period during the last seven census decades(1951-2011)
  - 71 • Study the level of urbanisation in the study area in the last seven decades .
  - 72 • Determine the spatio-temporal pattern of urbanisation in Barasat subdivision during this period.
- 73

74 **4. MATERIALS AND METHODOLOGY** –The study is primarily based on secondary data  
75 sources. Both qualitative and quantitative approaches have been used in the study. The study involved  
76 collection of data from various published sources mainly involving the census data for the last 7 census  
77 years. Data has been collected from different sources like District Census Handbooks of North 24

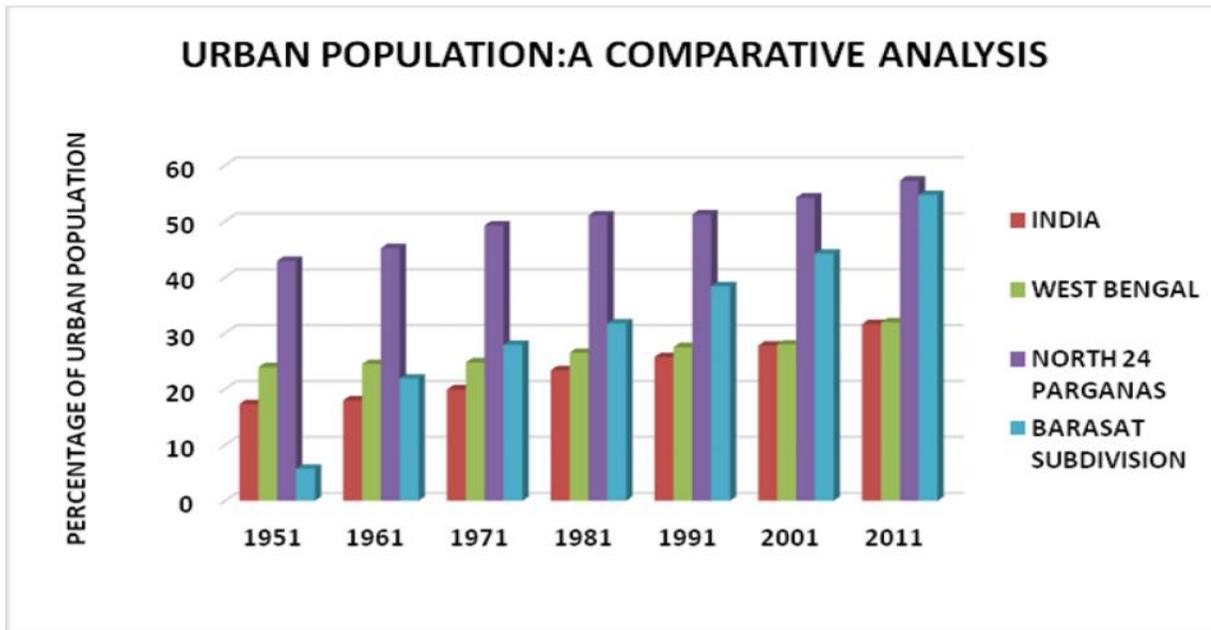
78 parganas for the years 1951, 1961, 1971, 1981, 1991 and Compact discs of 2001, 2011, published by  
79 Census of India. Data thus collected from the various census reports were compiled, tabulated and  
80 necessary calculations were done as per requirement.

81 The data after compilation and necessary calculation were presented in the form of maps, graphs and  
82 charts with the help of Statistical and GIS Softwares. Analysis has been done both quantitatively and  
83 qualitatively. Various quantitative methods like Mean, Standard deviation, Z score and Composite  
84 scores have been used for data analysis. Statistical analysis has been done using MS-Excel. Maps have  
85 been prepared to show the spatio-temporal variation of urbanisation in the subdivision.. All the GIS  
86 related analysis was done in ArcGIS 10.2 software.

87 Barasat Sub-Division Map was initially scanned at 300 dots per inch (DPI) resolution and converted  
88 into computer-readable Tagged Image File Format (.tiff) files. These .tiff files were then georeferenced  
89 using ArcGIS 10.2 Software with WGS 84 datum and Universal Transverse Mercator (U.T.M.)  
90 projection. Digitization of administrative boundary and selected features like major roads, railways,  
91 canals was done through ArcGIS 10.2 Software. Furthermore, population attributes has been attached  
92 with the shapefile of Barasat Sub-Division. Finally, population density map of Barasat Sub-Division  
93 was prepared in ArcGIS 10.2 Software.

## 94 5. RESEARCH FINDINGS AND DISCUSSION

95 **5.1 Growth of urbanisation-** Urbanisation is a process influenced by social, political and  
96 economic factors and urban development have statistically shown as being epicenters of economic  
97 growth resource development and occupational opportunities(Will, 2011). The Indian subcontinent  
98 shares with Mesopotamia and the Nile valley, a long history of urbanization. Urbanization continued at  
99 a much slower pace through the medieval period and started gaining momentum gradually during the  
100 colonial period. The phenomenon has shown remarkable progress in the post-independence period.  
101 After 1947 urban population is increasing by leaps and bounds, often faster than the global urban  
102 growth rate. Urban population has increased from 10.84% in 1901 to 17.29% in 1951 to 31.16% in  
103 2011(Census of India, 2011). Similarly in the post –independence period the state of West Bengal in  
104 general, and the district of North 24 parganas in particular, has experienced a massive spurt in urban  
105 growth. The growth in the percentage of urban population in both has far exceeded the national  
106 average.



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110

**Figure 2:** Comparative growth of urban population.

111 The above figure (Fig No.1) depicts the comparative growth of urban population in India, West  
 112 Bengal, North 24 Parganas and Barasat subdivision in the post independence period. Percentage of  
 113 urban population has shown a steady increase since independence more remarkably since 1991. The  
 114 percentage of urban population in India has increased from 17.29 to 31.61 while it has risen from 23.88  
 115 to 31.89 in the state of West Bengal. West Bengal has shown a slightly higher degree of urbanization  
 116 as compared to the national average. One of the causes for this trend can be attributed to the colonial  
 117 legacy of the state. Another cause is the influx of migrant population in the aftermath of partition in  
 118 1947 and creation of the new nation of Bangladesh in 1971. Sarkar ,J.P.(2006) identified four districts  
 119 of West Bengal viz. North 24 parganas, Nadia, Hooghly and Burdwan which maintained high  
 120 population growth rate since independence. The district of North 24 parganas has shown a higher  
 121 degree of urbanization as compared to both national and state average. It has been experiencing a very  
 122 high pace of urbanization both in terms of volume of urban population and number of urban centres.  
 123 Urban population has increased from 42.92% in 1951 to 57.27% in 2011. The total urban population in  
 124 the district has increased from 967790 in 1951 to 5807128 in 2011 implying about a six fold increase  
 125 during the last six decades. According to Bhattacharyee,D. and Hazra,S.(2018) urban momentum has  
 126 played a crucial role in transformation of North 24 parganas

127 Within the district, Barasat subdivision depicts an interesting picture in terms of urban growth. Here  
 128 urban population has increased from 5.72% to 54.67% during the same time period. Predominantly  
 129 being an agrarian belt, the region had a very low percentage of urban population at the time of  
 130 independence and thereafter for a considerable period of time. The process of urbanization started  
 131 gaining momentum since 1961. Urban population percentage steadily increased thereafter and crossed  
 132 the state average in 1971. The granting of subdivisional headquarter status to Barasat has further aided  
 133 the process. Although the subdivision has lower percentage of urban population as compared to the  
 134 district average but it is far above the state and national average. The following table depicts the  
 135 change in rural and urban population in the district along with the study area during the census years  
 136 1951-2011.

137 **Table 1- Comparative growth of urban and rural population in North 24 parganas and Barasat subdivision**

| Years | Percentage of population |       |                     |       | Change in percentage of population |       |                     |       |
|-------|--------------------------|-------|---------------------|-------|------------------------------------|-------|---------------------|-------|
|       | North 24 pgs             |       | Barasat Subdivision |       | North 24 pgs                       |       | Barasat Subdivision |       |
|       | Urban                    | Rural | Urban               | Rural | Urban                              | Rural | Urban               | Rural |
| 1951  | 42.92                    | 57.08 | 5.72                | 94.28 | -                                  | -     | -                   | -     |
| 1961  | 45.18                    | 54.82 | 21.86               | 78.14 | 47.34                              | 34.47 | 520.12              | 34.55 |
| 1971  | 49.26                    | 50.74 | 27.91               | 72.09 | 45.26                              | 23.31 | 79.41               | 29.64 |
| 1981  | 51.03                    | 48.97 | 31.72               | 68.28 | 36.37                              | 27.03 | 53.26               | 27.71 |
| 1991  | 51.31                    | 48.69 | 38.36               | 61.64 | 32.06                              | 30.58 | 79.59               | 34.09 |
| 2001  | 54.29                    | 45.71 | 44.23               | 55.77 | 30.04                              | 15.36 | 45.50               | 14.18 |
| 2011  | 57.26                    | 42.73 | 54.67               | 45.33 | 18.16                              | 4.76  | 51.80               | -0.16 |

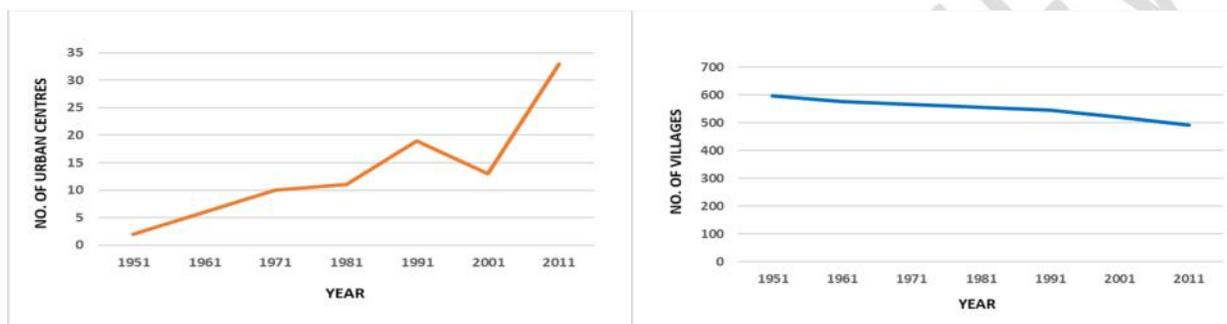
138 Source: Computed by the authors from different census reports, 1951-2011

139 The total number of towns has also grown in the entire subdivision. The number of towns has  
 140 increased from 2 in 1951 to 27 in 2011 along with six municipalities (Table no.2). Contrarily the  
 141 number of village across various police stations has shown a continuous decrease over the years. The  
 142 following table shows the change in the number of villages and urban centres in the subdivision-

143 **Table 2. Change in the no. Of villages, urban centres in Barasat subdivision**

| Year | No. Of Villages | No. of Urban Centres | Percentage Increase Of Urban Centres | Urban-Rural Ratio |
|------|-----------------|----------------------|--------------------------------------|-------------------|
| 1951 | 596             | 2                    | -                                    | 0.06              |
| 1961 | 577             | 6                    | 200                                  | 0.28              |
| 1971 | 567             | 10                   | 66.67                                | 0.39              |
| 1981 | 555             | 11                   | 10                                   | 0.46              |
| 1991 | 545             | 19                   | 72.73                                | 0.62              |
| 2001 | 520             | 13                   | -31.58                               | 0.79              |
| 2011 | 492             | 33                   | 153.85                               | 1.21              |

144 Source : Computed by the authors from District census handbooks, North 24 parganas, Census of India.



149 **Figure 3:** Change in the no. of villages and urban centres in Barasat subdivision (1951-2011)

150 Most remarkable decline in the number of villages is to be noticed in the last two decades primarily  
 151 owing to rapid increase in the growth of towns. The number of towns have shown steady increase since  
 152 independence. In the census year 2001, the number of towns have declined primarily due to clubbing  
 153 of several non-municipalities with the neighbouring municipal towns thus reducing the no. of urban  
 154 centres.

## 155 **5.2 Phases of urbanisation in the subdivision**

156 In the post –independence period the urbanization process in the subdivision can be divided into two  
 157 distinct phases-

### 158 **5.2.1 Period of Rapid Urbanisation (1951-1981)**

159 During this period urban population grew from 22546 to about 384460 registering almost a seventeen  
 160 fold increase. The percentage of urban population increased from 5.72 to 31.72. Urban concentration  
 161 during this period grew due to favourable geo-economic factors . Huge influx of migrant population  
 162 from erstwhile East Pakistan also aided urban growth. During this period no. of towns increased from 2  
 163 to 11 while the no. of villages declined from 596 to 555.

## 164 **5.2.2 Period of Steady Urbanisation (1981-2011)**

165 During this period urban population grew from 384460 to 1524964 registering almost a four fold  
166 increase. The percentage of urban population increased from 31.72 to 54.67. The no. of towns  
167 increased from 11 to 33 while the no. of villages declined from 555 to 492. Urbanization showed  
168 steady growth during this period primarily due to growth of infrastructural facilities in Barasat  
169 subdivision owing to the accordance of district headquarter status to Barasat town in 1986. This led to  
170 decline in importance of neighbouring Barrackpore subdivision. Besides, the urban growth in  
171 Barrackpore subdivision has almost reached a saturation level which has further aided the urban  
172 growth in Barasat subdivision.

## 173 **5.3 Level of Urbanisation In Barasat Subdivision (1951-2011)**

174 In the earlier part of the analysis, an attempt has been made to identify the nature, degree and tempo of  
175 urbanisation in Barasat Subdivision during the post independence period as a whole. However, within  
176 the subdivision, there exists wide differences in terms of levels of urbanisation. This part of the study  
177 attempts to analyse the spatio-temporal variation in the levels of urbanisation within the subdivision  
178 considering the Police Stations (1951-1981) and Community Development Blocks (1991-2011) as the  
179 areal units of study.

180 Different parameters have been used to measure the level of urbanisation in the study area. The  
181 following factors have been taken into consideration

- 182 a) Percentage of Urban Population to Total Urban Population of the Police Station / C.D. block.
- 183 b) Percentage of Urban Area to Total Urban Area of the Police Station / C.D. block.
- 184 c) Urban Population Density
- 185 d) Urban Spacing

186 **a) Percentage of Urban Population to Total Urban Population of the Police Station / C.D.**  
187 **block.-** This parameter is considered as one of the most important criteria to measure the level  
188 of urbanisation. Percentage of urban population in the police stations and C.D.blocks has been  
189 calculated with respect to the urban population of the entire subdivision.

190 **Table 3(a) : PS wise percentage of urban population to total urban population of the subdivision (1951-1981)**

| Police station | 1951 | 1961 | 1971 | 1981 |
|----------------|------|------|------|------|
|                |      |      |      |      |

|          |       |       |       |       |
|----------|-------|-------|-------|-------|
| Habra    | 28.91 | 55.93 | 45.26 | 40.74 |
| Deganga  | 0     | 0     | 0     | 0     |
| Rajarhat | 0     | 0     | 13.30 | 17.59 |
| Barasat  | 71.09 | 44.07 | 41.44 | 41.67 |
| Amdanga  | 0     | 0     | 0     | 0     |

191 Source- Computed by the authors from District census handbooks, North 24 parganas, Census of India(1951-1981)

192 The above table [Table-3(a)] clearly indicates that there exists wide variation among the police stations  
193 (1951-1981) and C.D. Blocks with respect to percentage of urban population. Urban population can be  
194 seen only in the police stations of Habra and Barasat in 1951 and 1961. Barasat in 1951 showed a  
195 greater percentage of urban population owing to its closer proximity to the state capital of Kolkata.  
196 However ,in 1961 , Habra showed a greater percentage of urban population probably due to influx of  
197 migrant population from erstwhile East Pakistan not accounted during the 1951 census. Rajarhat burst  
198 into the urban scene with a significant percentage of urban population in 1971, thus reducing the  
199 monopoly of Barasat and Habra. This scenario continued in 1981.

200 **Table 3(b): C.D.block wise percentage of urban population to total urban population of the subdivision (1991-2011)**

| C.D.Blocks | 1991  | 2001  | 2011  |
|------------|-------|-------|-------|
| Habra-I    | 7.30  | 6.42  | 6.22  |
| Habra-II   | 28.53 | 25.35 | 19.98 |
| Deganga    | 5.79  | 0     | 0.63  |
| Rajarhat   | 21.34 | 27.73 | 32.99 |
| Barasat-I  | 25.48 | 25.02 | 26.09 |
| Barasat-II | 11.56 | 15.47 | 13.65 |
| Amdanga    | 0     | 0     | 0.44  |

201 Source- Computed by the authors from District census handbooks, North 24 parganas, Census of  
202 India(1991-2011)

203 The situation somewhat changed after 1991 with Rajarhat rapidly increasing its share of urban  
 204 population during the last three census years. Besides Barasat-I has maintained a steady pace of  
 205 urbanisation throughout owing to its administrative status as the district headquarter. Due to rapid  
 206 surge of Rajarhat other C.D. Blocks have shown gradual decline in percentage share of urban  
 207 population. Amdanga has recorded a very late entry into the urban scene only after 2011. Deganga has  
 208 also shown an insignificant growth in urban population. Although it entered the urban scene in 1991, it  
 209 was declassified in 2001. It again entered the urban process in 2011. Both these C.D. Blocks have a  
 210 large agricultural hinterland which accounts for a significant rural population leading to a low  
 211 percentage of urban population.

212 b) *Percentage of Urban Area to Total Urban Area of the Police Station / C.D. block.* - The  
 213 change in total urban area of a spatial unit over time is also a significant measure of  
 214 urbanisation.

215 c) **Table No. 4(a): Percentage of urban area of p.s. to total urban area of the subdivision(1951-1981)**

| Police station | 1951  | 1961  | 1971  | 1981  |
|----------------|-------|-------|-------|-------|
| Habra          | 42.11 | 52.47 | 39.53 | 39.20 |
| Deganga        | 0     | 0     | 0     | 0     |
| Rajarhat       | 0     | 0     | 15.35 | 14.73 |
| Barasat        | 57.89 | 47.53 | 45.29 | 46.07 |
| Amdanga        | 0     | 0     | 0     | 0     |

216

217 Source- Computed by the authors from District census handbooks, North 24 parganas, Census of  
 218 India(1951-1981).

219 **Table No.: 4(b) –Percentage of urban area of c.d.blocks to total urban area of the subdivision(1991-2011)**

| C.D.Blocks | 1991 | 2001 | 2011 |
|------------|------|------|------|
|            |      |      |      |

|     |            |       |       |       |
|-----|------------|-------|-------|-------|
| 220 | Habra-I    | 10.78 | 10.12 | 11.16 |
| 221 | Habra-II   | 29.04 | 29.06 | 23.22 |
| 222 | Deganga    | 2.16  | 0     | 1.27  |
| 223 | Rajarhat   | 24.23 | 24.06 | 24.86 |
| 224 | Barasat-I  | 25.13 | 22.81 | 26.70 |
| 225 | Barasat-II | 8.66  | 14.00 | 11.11 |
| 226 | Amdanga    | 0     | 0     | 1.69  |

227 Source- Computed by the authors from District census handbooks, North 24 parganas, Census of  
228 India(1991-2011)

229 During 1951 and 1961 the total urban area of the subdivision was shared by Habra and Barasat police  
230 stations. Barasat enjoyed a greater percentage during 1951 while the situation reversed in 1961.  
231 Rajarhat entered the scene in 1971. It shared a significant part of urban area both in 1971 and 1981  
232 thus reducing the percentage share of Habra and Barasat. During the census year 1991, the concept of  
233 C.D. Blocks emerged. The percentage share of urban area in Habra-I and Rajarhat has steadily  
234 increased in the successive three decades while that of Habra-II has declined gradually. Barasat-I and  
235 Barasat-II have shown fluctuating trend. Deganga has a very insignificant percentage of urban area  
236 owing to rural dominance while Amdanga has entered the urban scene as late as 2011.

237 d) **Urban Population Density-** Urban Population Density designates the volume of total urban  
238 population per square unit of urban area. It is a good measure of the spatial variation of urban  
239 concentration.

240

241

242 **Table No. :5(a)-Urban population density of police stations (1951-1981)**

| Police station |  | 1951 | 1961 | 1971 | 1981 |
|----------------|--|------|------|------|------|
| Habra          |  | 629  | 5749 | 3722 | 4425 |

|          |  |      |      |      |      |
|----------|--|------|------|------|------|
| Deganga  |  | 0    | 0    | 0    | 0    |
| Rajarhat |  | 0    | 0    | 2803 | 5085 |
| Barasat  |  | 1125 | 5010 | 2962 | 3851 |
| Amdanga  |  | 0    | 0    | 0    | 0    |

243 Source- Computed by the authors from District census handbooks, North 24 parganas, Census of India(1951-1981)

244 Habra and Barasat had a low density in 1951, but it has steadily increased with a peak reaching in  
 245 1961. Rajarhat ,since its emergence on the urban scene, has maintained a high density owing to its  
 246 close proximity to state capital Kolkata and a boom in the infrastructural sector.

247

248 **Table No. 5(b): Urban population density of CD blocks (1991-2011)**

| C.D.Blocks | 1991 | 2001 | 2011 |
|------------|------|------|------|
| Habra-I    | 3679 | 4190 | 3927 |
| Habra-II   | 5341 | 5762 | 6057 |
| Deganga    | 2696 | 0    | 3527 |
| Rajarhat   | 6230 | 7610 | 9347 |
| Barasat-I  | 5426 | 7245 | 6882 |
| Barasat-II | 7259 | 7298 | 8654 |
| Amdanga    | 0    | 0    | 1824 |

249 Source- Computed by the authors from District census handbooks, North 24 parganas, Census of  
 250 India(1991-2011)

251 After 1981, administrative changes have taken place and analysis have been done taking C.D. Block  
 252 as an areal unit. Barasat-I and Habra-I block has shown a slightly fluctuating trend while Habra –II  
 253 has shown a steadily rising trend due to increasing population pressure of Habra and Ashoknagar-  
 254 Kalyangarh municipality. Rajarhat is the key area where urban population density is very high. The  
 255 region which started as a satellite town is developing very fast due to paucity of space in nearby  
 256 Kolkata. Open spaces are being rapidly filled up with massive housing development projects and other

257 commercial projects. Barasat-II also has high density due to closer proximity to Kolkata. Deganga and  
258 Amdanga have lower density due to their strong agrarian base.

259 **d) Urban Spacing-** Spacing of settlements is largely governed by their size. Large settlements would  
260 be closely spaced while smaller settlements would be widely spaced. These spatial patterns are  
261 constantly changing in time and space which has resulted in an increase in the size of settlements and  
262 reduction in their spacing.

263 **Table 6(a)- Urban spacing of police stations (1951-1981)**

| Police station | 1951  | 1961  | 1971  | 1981  |
|----------------|-------|-------|-------|-------|
| Habra          | 0.097 | 0.098 | 0.08  | 0.07  |
| Deganga        | 0     | 0     | 0     | 0     |
| Rajarhat       | 0     | 0     | 0.089 | 0.066 |
| Barasat        | 0.106 | 0.110 | 0.085 | 0.075 |
| Amdanga        | 0     | 0     | 0     | 0     |

264 Source- Computed by the authors from District census handbooks, North 24 parganas, Census of  
265 India(1951-1981)

266 Taking Police stations(1951-1981) and C.D.Blocks (1991-2011) as areal unit , the spacing of urban  
267 settlements have been calculated by employing Sarkar's method for the census years(1951-2011). The  
268 Inter-settlement spacing is given by the equation:

269 Inter-Settlement Spacing:  $2 \cdot \sqrt{(A/n)}$

270 Where, n shows the number of urban settlements within the Police Stations/C.D. Blocks with an area  
271 of 'A'.

272 During the period (1951-1981), urban spacing has gradually declined over the decades owing to  
273 increase in population pressure. Similar trend can be seen in Barasat police station. Rajarhat has also  
274 shown progressive decline in urban spacing in the two decades of 1971 and 1981.

275 **Table No. 6(b)- Urban spacing of c.d.blocks (1991-2011)**

| C.D.Blocks | 1991  | 2001  | 2011  |
|------------|-------|-------|-------|
| Habra-I    | 0.075 | 0.063 | 0.062 |
| Habra-II   | 0.063 | 0.057 | 0.053 |
| Deganga    | 0.089 | 0     | 0.066 |
| Rajarhat   | 0.057 | 0.048 | 0.042 |
| Barasat-I  | 0.060 | 0.049 | 0.048 |
| Barasat-II | 0.049 | 0.048 | 0.043 |
| Amdanga    | 0     | 0     | 0.095 |

276 Source- Computed by the authors from District census handbooks, North 24 parganas, Census of  
277 India(1991-2011)

278 During the period (1991-2011), a similar picture is seen in all the C.D.Blocks(Table 6b) of the  
279 subdivision. As urban population in all the C.D. Blocks is rapidly increasing after 1981, urban spacing  
280 has declined in all the blocks. Rajarhat, the fastest growing block in the subdivision , shows the  
281 minimum values in urban spacing. It is followed closely by Barasat-II, another fast growing urban  
282 area. Urban spacing is also quite low in Barasat-I where the district headquarter is located.

#### 283 **5.4 Spatio-temporal pattern of urbanisation in Barasat subdivision**

284 On the basis of the above discussed parameters, the spatio-temporal pattern of urbanisation has been  
285 analysed in Barasat subdivision. However this is to be noted that a police-station/C.D.Block does not  
286 show same rank in all criteria. A Composite Value of level of urbanisation has been developed on the  
287 basis of Summation of Z Score to obtain an overall idea of the combined effect of all the chosen four  
288 parameters discussed in the preceding section. The following procedure has been followed in this  
289 regard-

- 290 a) Mean and standard deviation values of each attribute for the Police Stations (1951-1981) and  
291 C.D.Blocks (1991-2011) during each census year have been computed.
- 292 b) Since the units of measurement for each criteria is different, in order to make them comparable  
293 the values of each criteria have been transformed into a standard form using the standard score  
294 (Z score).

295 c) The Z scores on all the four criteria have been then added together to give a Composite Index  
 296 (C.I.). Summation of Z scores for some of the areal units have shown negative values. All the  
 297 negative value of the ‘Summation of Z score’ has been converted into positive ones by adding  
 298 ‘7’ with every Zscore of each areal unit.[Table-7] and [Table-8]

299 **Table No.-7: Level of urbanisation during 1951-1981 in Barasat subdivision (p.s.wise)**

| Police Stations | Composite Z Score For Lu,1951 | Police Stations | Composite Z Score for Lu,1961 |
|-----------------|-------------------------------|-----------------|-------------------------------|
| Barasat         | 12.67                         | Habra           | 11.68                         |
| Habra           | 9.62                          | Barasat         | 11.03                         |
| Rajarhat        | 4.23                          | Rajarhat        | 4.08                          |
| Deganga         | 4.23                          | Deganga         | 4.08                          |
| Amdanga         | 4.23                          | Amdanga         | 4.08                          |

300

| Police Stations | Composite Z Score For Lu, 1971 | Police Stations | Composite Z Score For Lu, 1981 |
|-----------------|--------------------------------|-----------------|--------------------------------|
| Habra           | 10.72                          | Barasat         | 10.58                          |
| Barasat         | 10.49                          | Habra           | 9.77                           |
| Rajarhat        | 7.87                           | Rajarhat        | 8.23                           |
| Deganga         | 2.98                           | Deganga         | 2.95                           |
| Amdanga         | 2.98                           | Amdanga         | 2.95                           |

301 Source- Computed by the authors

302 **Table No. 8: Level of urbanisation during 1991-2011 in Barasat subdivision(c.d. block wise)**

| C.D. Blocks | Composite Z<br>Score for<br>Lu,1991 | C.D. Blocks | Composite Z<br>Score for<br>Lu,2001 | C.D. Blocks | Composite Z<br>Score for<br>Lu,2011 |
|-------------|-------------------------------------|-------------|-------------------------------------|-------------|-------------------------------------|
| Habra-Ii    | 10.2                                | Habra-Ii    | 10.26                               | Rajarhat    | 9.9                                 |
| Barasat-I   | 9.52                                | Rajarhat    | 10.22                               | Barasat-I   | 8.96                                |
| Rajarhat    | 9.28                                | Barasat-I   | 9.82                                | Habra-I     | 8.37                                |
| Barasat-Ii  | 7.19                                | Barasat-Ii  | 8.27                                | Habra-Ii    | 8.13                                |
| Habra-I     | 6.61                                | Habra-I     | 7.2                                 | Barasat-Ii  | 6.91                                |
| Deganga     | 5.69                                | Deganga     | 1.77                                | Amdanga     | 5.28                                |
| Amdanga     | 0.69                                | Amdanga     | 1.77                                | Deganga     | 4.33                                |

303 Source- Computed by the authors

304 On the basis of the Composite values the Police Stations and C.D.Blocks have been classified into the  
305 categories of high, moderate and low levels of urbanisation.

306 **Table No. 9: Spatial distribution of police stations for level of urbanisation(1951-1981)**

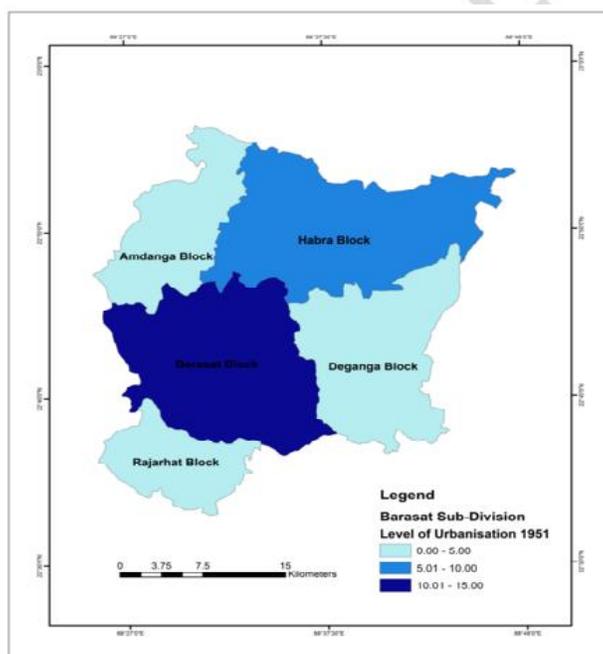
| Census Year | Composite Value for Level Of Urbanisation |                       |                        |
|-------------|---|-----------------------|------------------------|
|             | Low (Less Than 5.00)                      | Moderate (5.00-10.00) | High (More Than 10.00) |
| 1951        | Rajarhat, Deganga, Amdanga                | Habra                 | Barasat                |
| 1961        | Rajarhat, Deganga, Amdanga                | -                     | Habra, Barasat         |
| 1971        | Deganga, Amdanga                          | Habra, Rajarhat       | Barasat                |
| 1981        | Deganga, Amdanga                          | Habra, Rajarhat       | Barasat                |

307 Source- Categorised on the basis of Table-9

308 The above table clearly indicates the urban scenario in the subdivision till 1981. Deganga and  
309 Amdanga police stations, being entirely rural, have consistently shown poor performance in the

310 urbanisation process. Rajarhat was also in the similar bracket till 1961. However a sudden spurt in  
311 urbanisation process can be seen in the year 1971 in this police station. The reason may be attributed to  
312 its proximity to Salt Lake which was being developed as a planned new township to accommodate the  
313 urban spill from the already congested Calcutta metropolice. Habra had shown medium level of  
314 urbanisation in the beginning . However it started showing rapid rise in urban development in 1961  
315 making it to the high level of urbanisation in 1961 mainly due to the influx and settlement of migrant  
316 population from across the border. But the momentum slightly slackened in 1971 and 1981 and it fell in  
317 the medium category along with Rajarhat. Barasat police station, being the headquarters of not only the  
318 subdivision, but also the district, has consistently shown high level of urbanisation throughout all the  
319 census years.

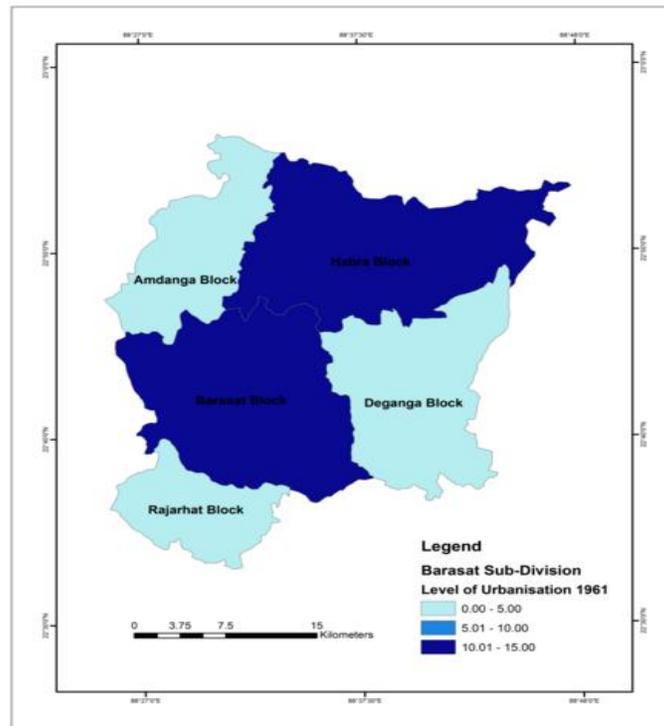
320 **FIG 4-** Level of urbanisation in Barasat subdivision, 1951



321

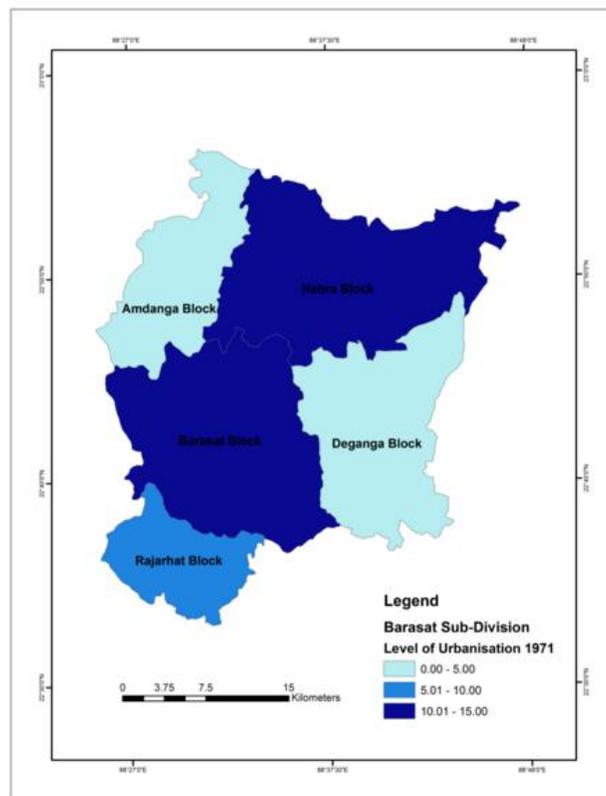
322 **FIG. 5:** Level of urbanisation in Barasat subdivision, 1961

323



324

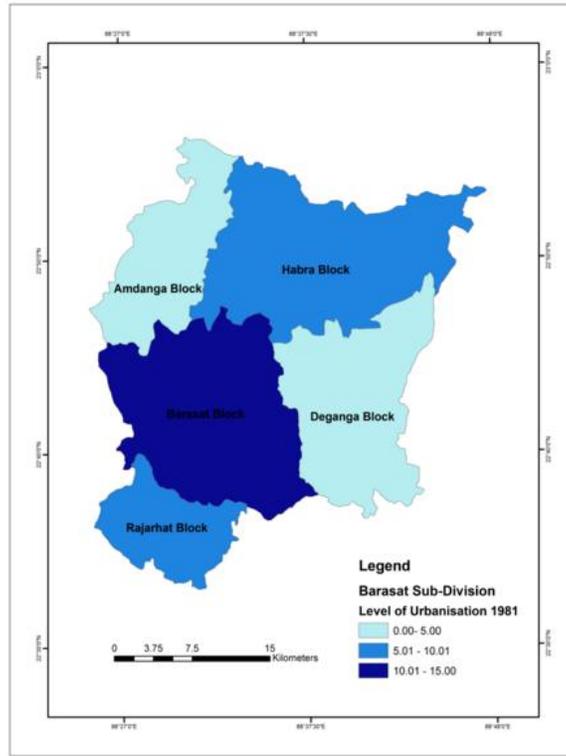
**FIG. 6:** Level of urbanisation in Barasat subdivision, 1971.



325

326

**FIG. 7:** Level of urbanisation in Barasat subdivision, 1981.



327

328

**Table No. 10:** Spatial distribution of c.d. blocks for level of urbanisation,1991-2011.

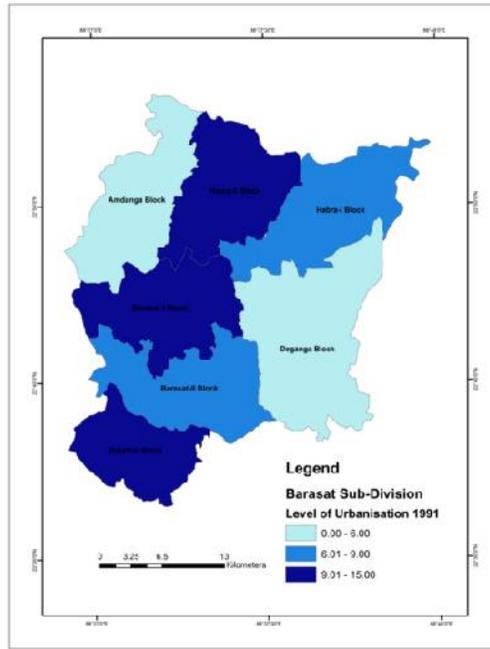
| Census Year | Composite Value For Level Of Urbanisation |  |                               |
|-------------|---|--|-------------------------------|
|             | Low(Less Than 6.00)                       | Moderate(6.00-9.00)                      | High(More Than9.00)           |
| 1991        | Deganga, Amdanga                          | Habra-I, Barasat-Ii                      | Habra-Ii, Barasat-I, Rajarhat |
| 2001        | Deganga, Amdanga                          | Habra-I, Barasat-Ii                      | Habra-Ii, Barasat-I, Rajarhat |
| 2011        | Deganga, Amdanga                          | Habra-I, Habra-Ii, Barasat-I, Barasat-Ii | Rajarhat                      |

329

Source- Categorised on the basis of Table-10

330

**FIG. 8:** Level of urbanisation in Barasat subdivision, 1991.



331

332 The scenario has somewhat changed in the 1990s. The administrative set-up changed in the 1991  
 333 census with the concept of C.D blocks being introduced. The subdivision, henceforth, has been  
 334 subdivided into 7 C.D.blocks. Deganga first entered the urban scene in 1991, but in 2001 it was again  
 335 declassified and designated into rural category. It again entered into the urban layout in 2011 along  
 336 with Amdanga. However both these community development blocks have shown low levels of  
 337 urbanisation due to predominantly rural hinterland and significant agricultural base. Habra-I and  
 338 Barasat-II have shown moderate levels of urbanisation both in 1991 and 2001.

339

**FIG. 9:** Level of urbanisation in Barasat subdivision, 2001.

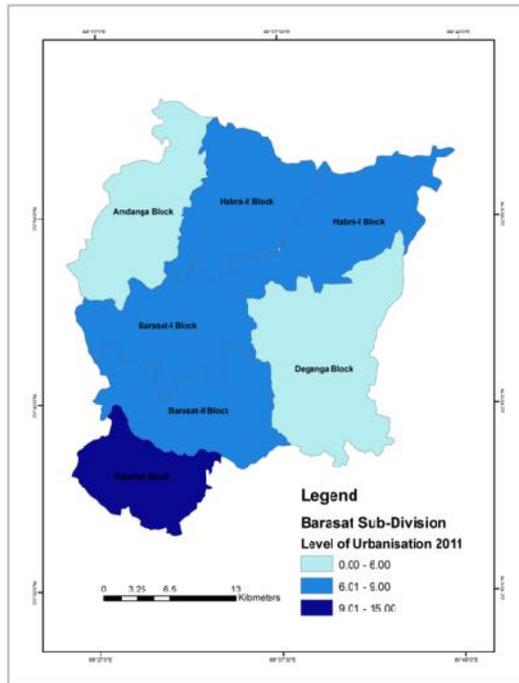
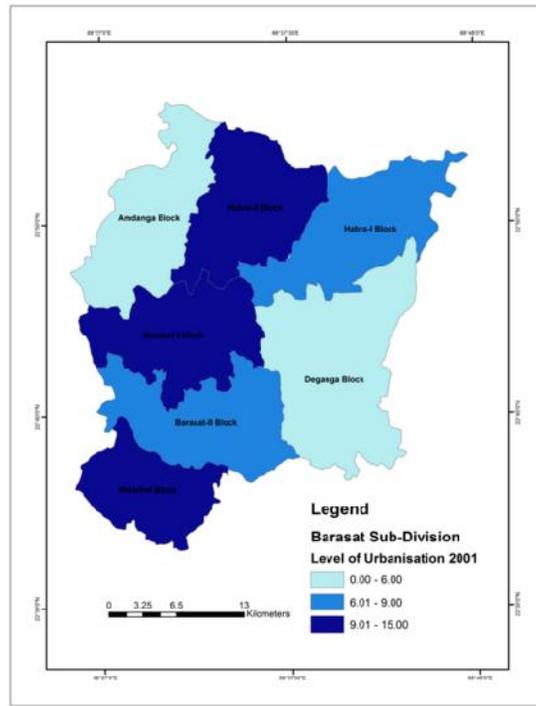
340

341 The reason may be attributed to the fact that these areas traditionally had high level of urbanisation  
342 and are presently stagnating. Similar situation is seen in Habra-II and Barasat-I in 2011.

343

**FIG 10:** Level of urbanisation in Barasat subdivision, 2011.

344



345 The most interesting feature of urbanisation in the region has been the overwhelming performance of  
346 Rajarhat in the entire period. Despite its late entry into the urban scene it has surged far ahead of all the  
347 other C.D.blocks in level of urbanisation owing to its locational advantage of nearness to highly urban  
348 Bidhannagar subdivision and the state capital of Kolkata which is fully urban. Besides the real state  
349 boom and the Government initiatives to develop the region as satellite town to ease the urban pressure  
350 of Kolkata has further aided its growth. Presently many of the IT sector companies and other large  
351 commercial companies have their office located in this area. Of late, in 2015, Rajarhat-Gopalpur  
352 municipality has been incorporated within the Bidhannagar municipal corporation.

## 353 5.5 CONCLUSION

354 On the basis of the above study the following conclusions can be made-

- 355 (i) A rising trend of urbanisation in the entire subdivision is seen in the post-independence period  
356 similar to that being experienced in the entire country but at a slightly higher pace in  
357 consonance with the district's trend which is higher than that of both the state and national  
358 average. However the pace of urbanisation is slower in the subdivision than the district rate  
359 mainly due to its strong agricultural hinterland and its close proximity to the highly urbanized  
360 Barrackpore subdivision.
- 361 (ii) The analysis regarding the level of urbanisation in Barasat subdivision during the period 1951-  
362 2011 shows, that there exists wide variation in the level of urbanisation in the region. In fact  
363 the level of urbanisation does not conform to any definite pattern. The level is very low,  
364 throughout the period, the Deganga C.D. block and the Amdanga C.D. block.
- 365 (iii) The spatio-temporal pattern of urbanisation is quite interesting. Urbanisation is low in the  
366 eastern and north western part of the subdivision. The major cause is the prosperous  
367 agricultural base of the two blocks, Amdanga and Deganga, which support a large rural  
368 population. In fact these two blocks have marked their slow entry into the urban fold as late as  
369 2011. Habra-I, Habra-II, Barasat-I and Barasat-II have medium levels of urbanization during  
370 the later period of the study. Although Habra and Barasat had traditionally high urban  
371 population, the urban surge in Rajarhat in the recent times, has somehow slackened the pace in  
372 these regions. The most remarkable feature is the high level of urbanisation being experienced  
373 in the southern portion of the subdivision in Rajarhat C.D. block. However unrestricted  
374 growth of urbanisation in this area may create pressure on existing resources.

375 As the urbanisation pattern is highly uneven, steps are needed for a more equitable and  
376 sustainable urban development particularly in the eastern and north western fringes of the  
377 subdivision. The strong agricultural base of these areas can promote agro-based industries with  
378 adequate governmental support. This will help in increasing the employment opportunities  
379 along with a balanced urban development. It will also help to prevent the exodus of people  
380 towards the more established urban centres like Barasat, Habra and Rajarhaat and may help to  
381 ease their pressure. The study hopes to promote further research in this field so as to promote a  
382 more balanced and sustainable urban growth in the region without jeopardizing the health of  
383 environment.

384

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