

# Changing Population Density and Its Impact on “Chandannagar Municipal” Area: An Assessment



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**Abstract:** The paper is about Chandannagar’s transformation from a colonial town to the present. The city has been transformed from the erstwhile French colony to the present town in independent India. The landuse change is noticeable as obvious from 1991 to 2011 census population data. As a result, the built up area has increased associated with gradual decline in farm lands and natural vegetation. The projected population in Chandannagar also suggests increased population density in 2021, lesser man-land ratio, and higher real estate price in future. The growing urbanisation has also resulted in low maintenance of buildings of historical importance here. The perception of local people as evident from participatory survey suggests urgent need to focus on the dwindling heritage buildings, promote sustainable tourism, better municipal services in Chandannagar.

**Key words:** Landuse, Chandannagar, built up area, population, French

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## I INTRODUCTION

Chandannagar is one of those urban centers which is quite older than Kolkata and has been established by French traders primarily as a trading port to avail the opportunities offered by the River Hooghly and as an easy route of fleets engaged in export and import of commodities and also continued even after India became independent.

Chandannagar is one of the very old human settlements of our state. It is apparent from some writings that the name ‘Chandernagore’ was derived from the term ‘Chandra’ (Moon), The Hugli River has meandered in eastern Chandernagore, which resembles a part of the moon’s orb and due to this crescent like shape, the name ‘Chandernagore’ has been originated. But some scholars think that the name came from the ‘Chandan’ (Sandal Wood). During the last quarter of 17<sup>th</sup> century, sandal wood was exported from here, and also red sandal was exported in huge quantities. Due to the Chandi temple, the place may have been called as ‘Chandir nagore’ (the place of Chandi) which afterward came to be known as ‘Chandernagore’ at the time of French colonial rule. Earlier, *nagar* meant big temple so; the term *nagar* might have derived from this history. In this backdrop, the study has been made about the city, which has developed from a flourishing European colony to a modern suburb of Kolkata. Growing population has resulted

in urban modifications from heritage buildings to modern residential areas, expansion of the city to previously uninhabited areas causing loss of wetlands, farming lands, and changes in the built up area. The growing urbanisation results in deterioration of the quality of life, pollution, loss of heritage sites etc.

## II STUDY AREA

The city is located at a distance of 31 km. north of Calcutta on the right bank of Hooghly River that is the eastern part and in western part Saraswati River was flowing in the past period. The area of corporation has also been increased with the recent amalgamation of adjoining Khalisani within its limit in the year 1994. As a result the total area of the city has now been increased by 2.35 sq.km. and the population by about 20,000. Geographically the city is located between latitude 22°51'44.10"N and longitude 88°22'4.66'E with a total area of 22.03 km<sup>2</sup> that have divided into 33 wards. The city is divided in two parts in line with its temporal expansion of its geographical location and also the nature of land. The study unit Chandernagore or Chandannagar is located in the Chandernagore Sub-Division of Hugli District. It is one of the oldest Municipal Corporations of West Bengal.

Area developed prior to 1991 (Ward 1 to 27) is now the core area of the town. Core activities are carried out in this part of the town since the French rule.

Added area, i.e. Post-1991 development: (Ward 28 to 33) encompasses the added area of Chandernagore; initially was under the jurisdiction of Khalisani Gram Panchayat before its amalgamation with the Chandernagore Municipal Corporation (CMC) on 31st December 1994. Geographically, the city is surrounded by Hugli- Chinsurah-Magra Block, Chinsurah Municipality, Polba-Dadpur Block along with Singur Block in the north, Singur CD Block and Bhadeswar Municipality in the south, Singur CD Block in the west, and Hugli River in the east. The G.T. Road passes through the eastern part and the Eastern Railway in the middle of the town connects it with rest of the state. The Delhi Road runs through the western part of the town.

## III METHODOLOGY

The study has been conducted in Chandannagar on the basis of secondary as well as primary data and information. The existing satellite images have been referred for depicting 1991, 2001 and 2011 census years and population distribution in the town. The built up index, vegetation index have been used for showing changing nature of urbanisation. Participatory survey was conducted for getting access to the feedback of local people regarding the changing face of the French colony, municipal services, heritage buildings etc.

The projected 2021 population is used here for estimating population growth in Chandannagar. For the calculation of projected population of 2021 the following formula has been used:

Firstly,

For the annual growth rate =  $[(P_{2011} - P_{2001}) / P_{2001} * 100] / \text{interval between two years 2001 and 2011}$ .

Secondly,

For the projected population =  $P_{2011} [1 + (r/100)]^{\text{interval between 2011 \& 2021}}$ .

The present study is applied in its kind and the methods of study followed are both analytical and descriptive. The satellite imageries are obtained from secondary sources. Built-up Index or

BUI has been used to detect the change in urban built up area. Normalised Differences Built up Index, i.e. NDBI and Normalised Differences Vegetation Index, i.e. NDVI has been computed using Arc GIS 10.2 software to identify the BUI. Built-up area has been detected on the basis of the arithmetic calculation of three bands; e.g. red (RED), near infrared (NIR) and mid-infrared (MIR). Applying such methodology, change in the built-up area can be identified by recognising the difference between the NDBI and NDVI for 1991 to 2011. Landsat 5 Thematic Mapper (TM) data of 1991 and 2011, and Landsat 7 Enhanced Thematic Mapper Plus (ETM+) data of 2001 are used to spot built-up areas. Normalised Difference Built-up Index (NDBI) are used to map the urban built-up areas with automated method on the basis of secondary source of data (Zha et al. 2003, Ghosh et al. 2018b).

#### IV SOME HERITAGE SITES OF CHANDANNAGAR

Chandannagar is an important town of Hooghly District and famous for its own Jagadhatri puja and overwhelming lightings. Chandannagar became the base of French and the city remained under their control from 1816-1950.

##### **Chandannagar Museum**

It is one of the major attractions of Hooghly district. In 1730, Joseph Francois Dupleix was appointed as the Governor of Chandannagar. It was the main centre of commerce in Bengal. Today the reminiscence of Dupleix's glorious years in Chandannagar is housed in the 'Institute De Chandannagar' that stands in a grand manner located in the Strand commanding a view of the Hooghly River.

Photograph 1: Institute De Chandannagar



Photograph 2: Statue of Marianne, a national symbol of France, outside the Dupleix mansion.



##### **Church**

The road off the strand takes to the Sacred Heart Church. The Church stands over for two centuries to mark the beauty of the architecture and aesthetic landscape of the period. This Roman Catholic Church was built in 1875 and has beautiful stained glass paintings.

Photograph 3: Sacred Heart Church



### Nanda Dulal Temple

Indra Narayan Chowdhuri built Nanda Dulal Temple in 1740. The temple is an excellent example of Indian sculpture. It is believed to be the largest 'Dui chala' (double-sloped roof) temple of Bengal. There is a landscape with a little pond on the rear; the wall still carries the imprint of Clive's cannon balls.

Photograph 4: Nanda Dulal Temple taken by Anushri Rakshit



### Strand

Chandannagar Strand is the most beautiful tourist spot along the bank of river Ganga. It is a superbly decorated pavement studded with light surrounded by lush green trees. It looks like the entire town is on the promenade with shopping carts and ferries on either side of the Strand selling street foods.

Photograph 5 to 7: views of strand





In Strand there are several ghats. Among this 'Jora Ghat' was mainly used for bathing, separate ghat for ladies and gentlemen. The name Jora Ghat means pair-Jora; as two ghats or broad flight of steps situated on the riverbank are there. There was a jetty; a slanting area through which goods were carried. There was a 'Chandni' which is the elegant looking pavilion consists of slender columns with decorative stucco works consisting of elephant's head and floral design. It was built in honour of Durga Charone Roquette (Durga Charan Rakshit), the courtier of French government.

Photograph 8 and 9: photos of Jora ghat in Strand



Photograph 10 and 11: Sculpture of Chandni



### **Patal Bari (underground house)**

Patal Bari is situated at the last portion of Strand is worth a visit place as its lowest floor is submerged in the river. Some very prominent personalities resided in this house during their visit to the town including Rabindranath Tagore and Pandit Ishwar Chandra Vidyasagar.

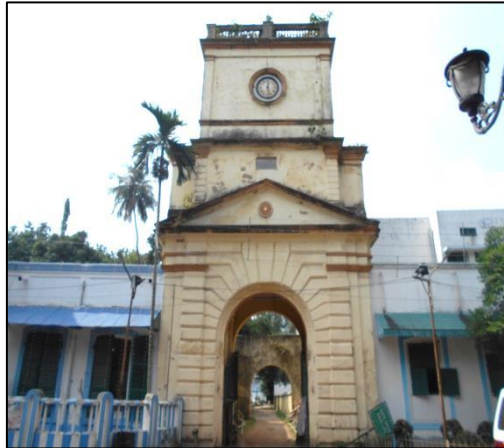
Photograph 12: Patal Bari



### **Clock Tower**

The Clock Tower building holds the glories of the French people. This one storey structure painted in beige contrasting with maroon outlines. The single storey is extended in a bungalow style while from the middle arch structure rises the two-storey long feature. In the centre of the structure sits the age-old clock from where the building derives its name. Indeed, it is a tall tower that mentions the time in Roman numerical.

Photograph 13: clock tower



Photograph 14: Views of roman numerical number clock



### **Liberty Gate**

Officially Chandannagar merged with West Bengal and became part of India in 1951, the vestiges of the Liberty Gate on the south of town acts as a reminder of the French connection with the inscription saying, 'Liberte', 'Egalite' and 'Fraternite' meaning Liberty, equality, fraternity – the three pillars of the French revolution.

Photograph 15 and 16: Liberty Gate



### V CHANGES IN BUILT UP AREA IN CHANDANNAGAR

In this map of built-up area of Chandannagar old area is shown besides, added areas, rivers and canals. The maps of 1991 to 2011 show population increase and built up area has also increased. Built up area increased from 7.90 sq.km in 1991 to 11.67 sq.km in 2001 which increased to 13.92 sq.km in 2011.

The map of 1991 shows, that in the eastern part of the map from north to south, this area was actually built up area, although scattered. In the east, the Hooghly River is flowing. Along the side of Hooghly River, the built up area was dense in Ward number 4,5,6,7,11,12,16,17,23,24,25, and 26. But in the inner area the built up area was scattered in Ward number 1, 2, 3, 8, 9, 10, 13, 14, 15, 18, 19, 20, 21, 22 and 32. In the east side of this area there is G.T. Road and in the west side of the area the railway lines are present. In the added area, few built up areas can be seen in ward numbers 28, 29, 30, 31, and 33. The total number of population was 1,20,378 persons in 1991. The map of 2001 shows, that in the eastern part the built up area has increased. By the side of the Hooghly River area built up area was more frequent, particularly in ward numbers 3, 4, 5, 6, 7, 10, 11, 12, 13, 16, 17, 22, 23, 24, 25 and 26. As we enter the interior area, the built up area has increased from scattered to frequent in ward numbers 1, 2, 8, 9, 14, 15, 18, 19, 20 and 21. Here in the added area from the railway line to the south western side, the built up area was scattered including wards 28, 29, 30; but near railway line the wards 31, 32, 33 were almost dense. The total population was 1,62,187 persons. The male population was 84,181 persons and female population was 78,006 persons. The map of 2011 shows, that in the eastern part beside the Hooghly River, the built up area was extremely dense; particularly in wards 3, 4, 5, 6, 7, 10, 11, 12, 13, 16, 17, 22, 23, 24, 25 and 26. In the interior area the built up area has increased compared to 2001 census year in wards 1, 2, 8, 9, 14, 15, 18, 19, 20, 21. In the added area on two sides of railway line the built up area has increased including wards 31, 32 and 33 and built up area was scattered to frequent including wards 28, 29, 30 compared to 2001 census year. In this census year the total number of population was 1,66,771 persons. Among this the male population was 84,117 persons and female population was 82,654 persons.

Fig: 1 Landuse in Chandanangar in 1991      Fig: 2 Landuse in Chandanangar in 2001

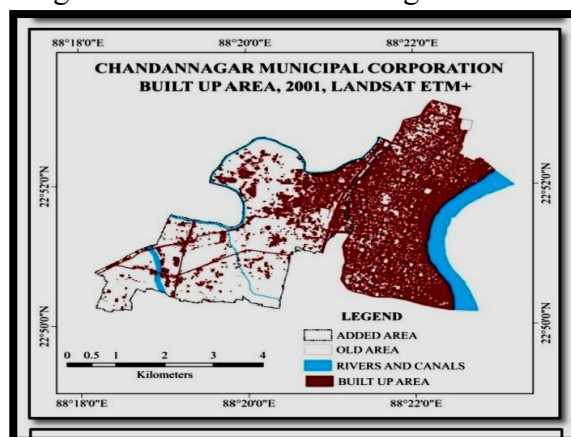
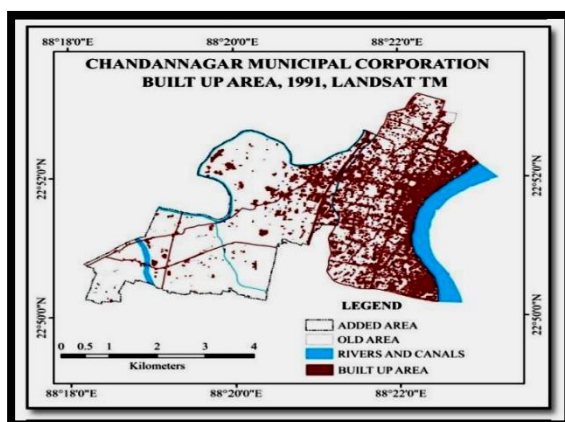
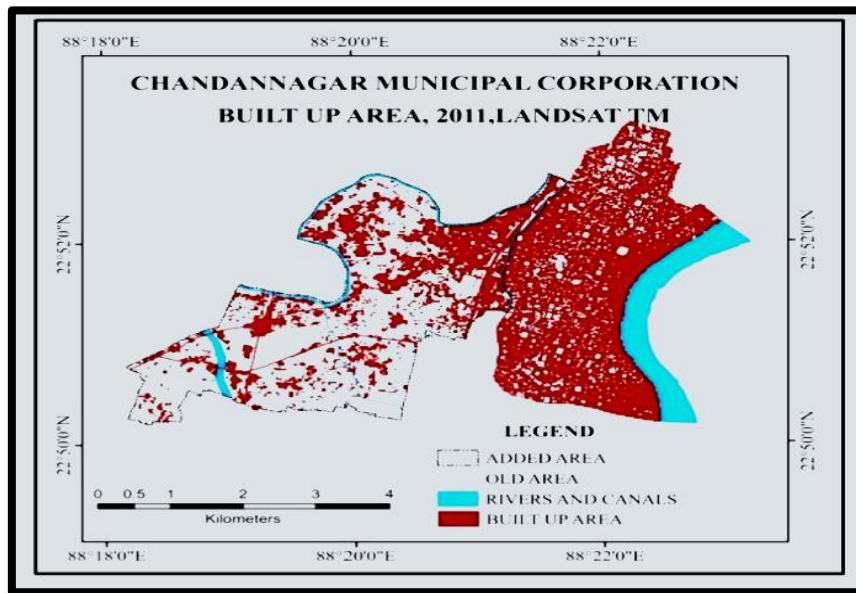


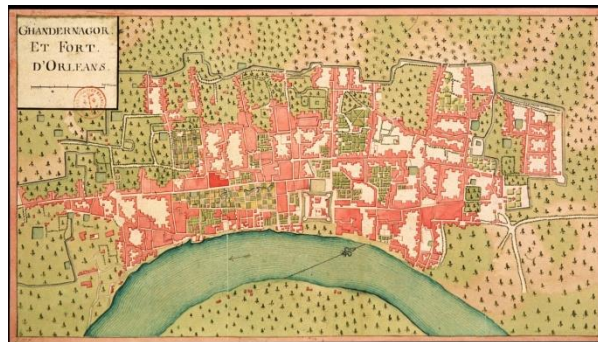


Fig: 3 Landuse in Chandannagar in 2011



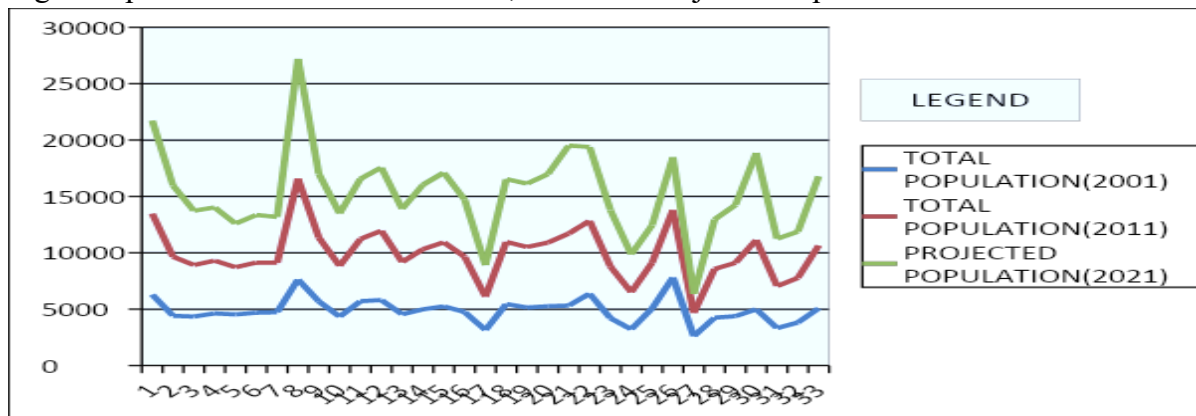
Source: Ghosh et al. (2018a)

Fig: 4 Map of Chandannagar in French period



Source: Chandannagar Municipality

Fig: 5 Population Growth Rate of 2001, 2011 and Projected Population of 2021



From this diagram we can see, that in many wards population has increased. In ward 8, from 2001 to 2011 highest population exists. In 2021 highest population growth rate will likely to be in ward number 8. In some of the wards population decreased from 2001 to 2011. In 2021



population will decrease in these wards. In wards 5, 6, 7, 9, 11, 17, 25, 26 and 27 depopulation is likely to happen. In added area of ward number 30 the highest population growth rate will likely to occur among all the wards in added area. So in the added part, population grows every year. So, population will increase in most of the wards and in few wards population will decrease. Participatory survey was conducted for getting access to the feedback of local people regarding the changing face of the French colony, municipal services, heritage buildings etc. Although most of the people are happy with the municipal services, there is flipside also. The recent expansion of the city is linked with population explosion, loss of wetlands, loss of natural vegetation, deteriorating buildings of historical importance. Many heritage buildings are in dilapidated condition. The people in general are in favour of regular maintenance of these historic buildings. The Figure 1 to Figure 3 demonstrate that the built up area of Chandannagar has changed from 1991 to 2011 due to growing urbanisation. Figure 4 shows that during the French rule, Chandannagar was limited to a small pocket near the access to the Hooghly River due to France's overwhelming dependence on water transportation. It suggests that the city is gradually expanding from the Hooghly River towards west. The agricultural fields and vegetated areas are shrinking leading to environmental degradation. People think that overcrowding has become a menace in recent years.

## VI CONCLUSION

Chandannagar is a city of olden times as well as of great historical importance. The city during the French rule had the rare privilege of enjoying a blend of indigenous and French culture. The population growth from 1991 to 2011 shows very high population increase. There is possibility of population increase in coming years.

Chandannagar incorporates a number of built up areas. These built up areas are actually the altered forms of either wet lands or previously vegetated areas. This directly impacts the ecological balance and quality of city life in Chandannagar and it ultimately affects the health of city dwellers. It may be mentioned that there is immense tourism potential of Chandannagar. The city can be showcased for tourism by the government in a better way by upgrading the infrastructure of not only the place but also the surrounding areas, such as, Bandel, Chinsurah, Serampore etc. There is potential of revamping hotel industries in this area with active cooperation of the Ministry of Tourism, hotel owners, travel agencies, the French Embassy, and local enthusiastic people and so on. France has been enthusiastic for revival of the city's lost glory as evidenced from recent activities of the French government. The main objective of the French initiative is to restore the heritage buildings.

Restoration of old buildings needs investment, which is possible only if the Government of India, the Government of West Bengal and France as well as crowd funding provide money for the development of this city. The projected population in Chandannagar suggests greater than before population density in 2021, lesser man-land ratio, as well as higher real estate price in future.

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