

Impact of Population Growth and Relative Changes in Land Use Pattern: A Case Study of Balurghat Town, West Bengal, India

Dr. Prabir Kumar Kundu

Assistant Professor in Geography, Siliguri Mahila Mahabidyalaya, Siliguri, West Bengal (India)

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*Corresponding Author

Email: [pkkundu.geo\[at\]gmail.com](mailto:pkkundu.geo[at]gmail.com)

ABSTRACT

'Land use' means the use of land by human activities. The study of land use is an urgent need for urbanization, resource planning, cultural advancement as well as overall economic development of a nation. The potentiality of a region depends upon the scale of proper use of the land, both in extensive and intensive ways. The extensive use of land reflects such features as sparse population, dispersed settlements, unhealthy living, agro-based economy and poor transport network, while the intensive use of land reflects dense population, vertical expansion of residential complexes, sound agricultural production, industrial establishments, good transport network etc. However, economic and cultural advancement can better be carried out only through the systematic and balanced utilization of land i.e. to correct misuse, under use and over use of land. Thus, planners and developers can't think of any progress without proper and optimum use of land. Therefore, the land use study has an immense value for human sustenance. The intensity and type of land use decide the quantum and direction of infrastructural and social needs of the area. The fast growth rate of population has shortened the infrastructure as well as it creates heavy pressure on land in Balurghat town since the post-Bangladesh Liberation War. Like such a micro level investigation, the important consequences on land use are due to huge infiltration, unscientific residential development, haphazard urban growth and cropland change. Hence, to regulate the economic activity and to optimize the use of existing infrastructural facilities as well as planning for their expansion to meet its future needs, the only way is to emphasize proper land use to control this current situation in this town. Based on primary and secondary data, the present paper aims to reflect the relative changes in past and present land use and also tries to find out the impact of land cover changes on urban ecology. The major findings of the article reveal that enormous flow of immigrants in the past few decades from erstwhile East Pakistan vis-à-vis shifting of people from vast rural hinterland into Balurghat town are practically responsible for drastic change in land use mosaic.

1. Introduction

Social scientists have keen interest on population growth and related land use changes in recent times, particularly in the urban areas. The complexity of land cover change reflects through changes in cropland, agricultural intensification, deforestation, pasture expansion and urbanization. Hence, population growth is considered as the key driver for land use changes. Shifting of rural people towards urban areas and subsequent rapid urbanization is emerging as a general phenomenon throughout the developing world. Society has to pay off some definite costs for such rapid urbanization. Vulnerability to the environment and ecological balance is increasing day by day. Agricultural as well as forest lands are rapidly swallowed through the process of urbanization. As a result, the rural economy is becoming weaker and the villagers are often come to the urban areas in search of new jobs, better quality of life and security. Thus, the towns and cities facing enormous pressure of population reflected through the drastic changes in land use and it will increase even at a faster rate in near future. In West Bengal, small and medium towns play a vital role in this pace of fast urbanization. Balurghat, the headquarter of Dakshin Dinajpur District is also experiencing the same, although it has distinguished itself from the general trend of urbanization as observed in India. It was not an economically generative town. At present it is neither an

industrial nor a large scale trade based urban centre. Not only that the urban fabric of the town is almost rural in nature. But it is the fact that Balurghat experiencing a phenomenal urban growth since its birth as a municipal town. Actually it is purely resulted due to the political factor and later modified itself as an urban centre with an administrative identity. During independence it was merely a village with only a population of less than 5000 and after that this settlement witnessed rapid urbanization without the truest sense of urbanism.

2. Objectives

The following objectives are taken into consideration to continue the present paper:

- To identify the causative factors for huge population growth in Balurghat town.
- To examine major land use pattern and variations in ward-wise land use distribution.
- To analyze the relative changes in past and present land use of the town.
- To find out the effect of land use changes on urban ecology.

3. Data base and methodology

The data base of the present study was carried out both on primary and secondary levels. Data and information had

been gathered by consultation of several books, journals, magazines, records, reports etc. to study the population growth, its resultant urbanization and their immediate impact on urban land use. So many visits were made with the municipal officials and local elderly residents for data and information regarding this matter. Several field surveys were made in each ward of the town to assess the situation. The collected data have been analyzed, tabulated, interpreted and finally presented by GIS tool.

4. Study area

The name of the town has been probably derived from ‘Balukakirnaghat’ meaning ‘a ghat (river bank) full of sand’ (Roy, 2000, p. 12). The Balurghat municipal area is comprised of mouza Chakhabani, Khadimpur, Bonggi, Narayanpur, Balurghat, Bararaghunathpur, part of Hosseinpur and part of Dakra.

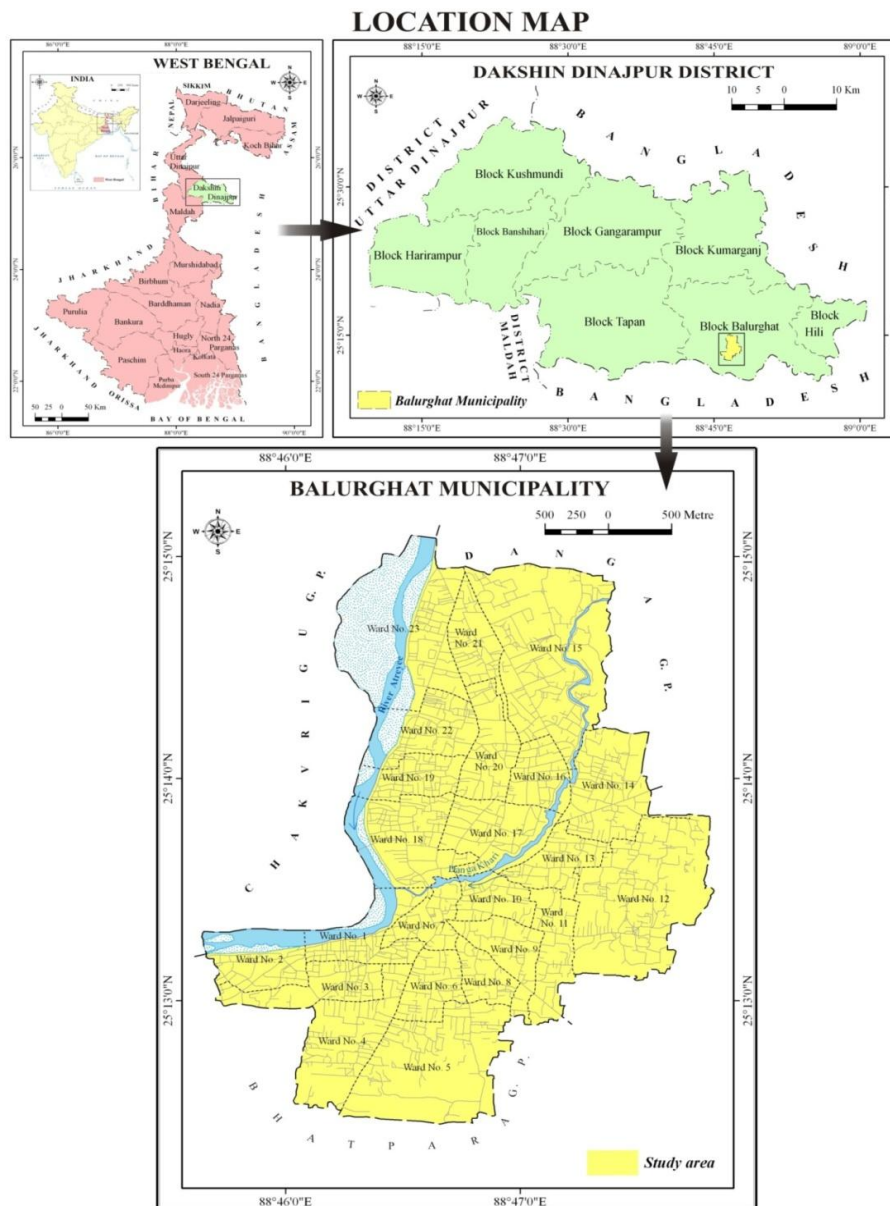


Figure 1.1 Location map of Balurghat Municipal Area.

It is situated on the eastern bank of River Atrayee and is spread over an area of 10.56 sq. km. with a population of 151,299 (2011) distributed among the 23 wards (Presently within 25 wards). The geographical location of Balurghat is 25° 12'27" N to 25°15'04" N latitude and 88°45'41" E to 88°47'43" E longitude, with an average elevation of about 24 m above the mean sea level. Perhaps it is the only municipal town in the State which is surrounded at the southern part by the long international boundary with Bangladesh by a margin of merely 1-2 km.

5. Population growth

In terms of volume and rapidity, the partition of India made perhaps the largest instance of voluntary and involuntary movement of mass population in modern history. Dakshin Dinajpur, one of the backward districts of West Bengal, demarcated by international border with Bangladesh on its three sides has experienced huge migration of refugees from erstwhile East Pakistan since independence and the flow drastically got mileage during and after Bangladesh liberation war. In this connection, Balurghat, the headquarter of the District of Dakshin Dinajpur which even 60 years ago had been

a mere village, in the historical context of the partition of India, overnight made its appearance as a town and today has been turned into a Class-I urban centre. Thus, Balurghat town is the proximate result of this migration. It was only a tiny hamlet with less than 5000 population during 1947. It got the status of a Class-I town (1981) only within three decades through a phenomenal growth rate. So, background of partition was the principal driver behind the conversion of this village to an urban centre. Heavy influx of immigrants in the recent past and later

shifting of people from the vast rural tract of this District into this town due to its pull factor as an administrative headquarter made it possible to get the status of a Class-I town within a short span of time. The partition of Bengal has led to the emergence of Balurghat town, later boosted by rural depopulation in the surroundings of the town reflected in the trend of population growth as well as dramatic changes in land use pattern.

Table 1.1 Decadal growth of population in Balurghat Municipality

Year	Area (sq.km.)	No. of Wards	Total Population	Decadal Growth (%)
1951	6.37	5	18,121	---
1961	8.50	5	26,999	48.99
1971	8.50	15	67,088	148.48
1981	8.50	15	1,04,646	55.98
1991	8.50	15	1,19,829	14.48
2001	10.56	23	1,35,737	13.31
2011	10.56	23	1,51,299	11.46

Source: Balurghat Municipality.

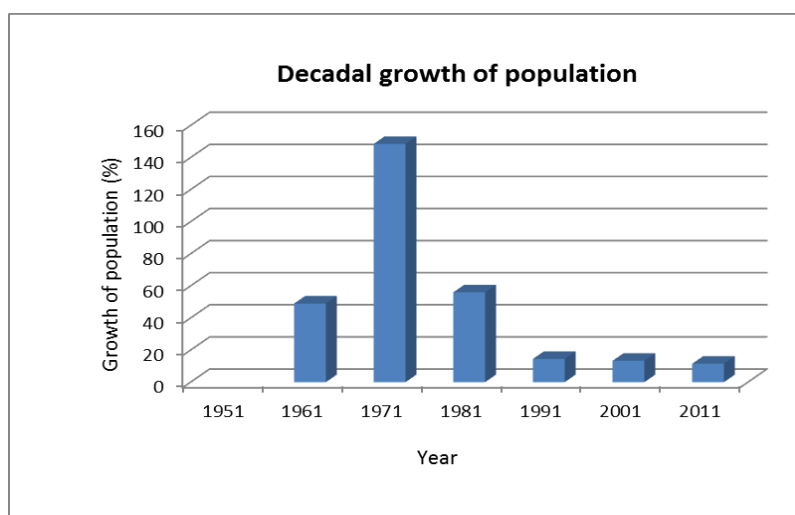


Figure 1.2 Diagram showing decadal growth of population of Balurghat Municipality.

6. Major land use

The urban fence of Balurghat town covers an area of 10.56 sq. km. But as stated earlier, most of the town has a typical rural character without the proper sense of 'urbanism' – particularly along the fringe areas of ward no. 12, 14, 15 in the extreme eastern part, peripheral parts of ward no. 1, 2, 3, 4, 5, 8, 9, 11 in the south-western and southernmost parts along with adjacent river bank areas of ward no. 19, 22, 23. The existing area of the town is utilized for several purposes like residential, commercial and business, administrative, public and semi-public institutional, roads, water bodies, drainage and sewerage, parks, play grounds and recreational open spaces, vacant and arable land etc. As the character of industrial backwardness of the district also reflects upon the land use of this town, therefore, it has a very little bit of industrial land use which basically of agro-based e.g. few rice mills, oil mills, saw mills and some brick kilns. The share of different land use categories of the town are presented below in table 1.2 and figure 1.3.

Table 1.2 Land use categories of Balurghat Town, 2001.

Land Use	Area (Sq. Km.)	% of Area
Residential	5.76	54.55
Parks & Green Cover	1.26	11.93
Water Bodies	1.17	11.08
Vacant/ Agriculture	1.16	10.98
Traffic & Transportation	0.63	5.97
Commercial	0.33	3.12
Public/ Institutional	0.15	1.42
Industrial	0.10	0.95
Total	10.56	100.00

Source: Balurghat Municipality.

Major land use of Balurghat municipality (2001)

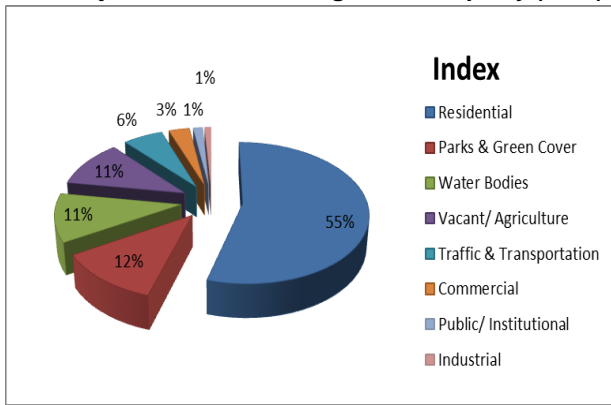


Figure 1.3 Percentage share of major land use in Balurghat Municipality.

from a tiny hamlet to Class-I urban centre only within three decades due to the immediate result of partition in 1947 followed by Indo-Pak war in 1971. Thousands of refugees and infiltrators from erstwhile East Pakistan made it possible a heavy concentration of population in the town. Most of the jungle covered lands and low lying areas were converted to their residences by night. In recent years, pressure on land is observed mainly due to the people coming into this town for job from outside of the district as well as from the vast rural tracts of the district to serve in the schools, colleges, banks, government offices, private sectors and ultimately settled down here. It is clear that the residential land use of Balurghat town is the key factor in shaping urban morphology which accounts about 5.76 sq. km. i.e. more than 50% of the total municipal area. Out of the 38041 households (2011), 95% is occupied for residential purpose.

The land use pattern of Balurghat town is remarkably dominated by residential use (54. 55%) as because it grew

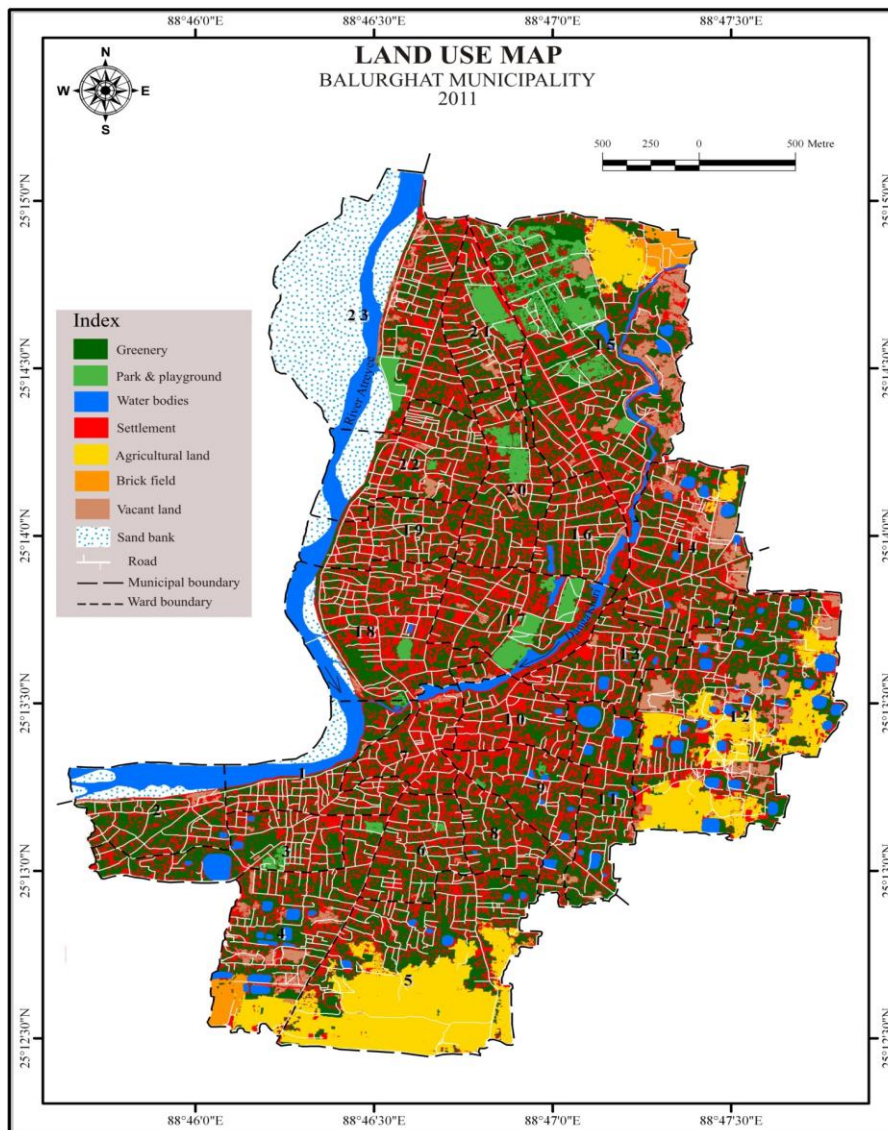


Figure 1.4 Land use pattern of Balurghat Municipality.

A considerable portion of the municipal area is devoted to greenery (about 12%) i.e. parks, play grounds, open spaces etc. which acts as the 'lung' of the town to make it an almost pollution free settlement. The town has a significant amount of

water bodies (11%). Except the river Atreyee and its tributary *Danga Khari* (both are of perennial nature), there are a number of ponds, tanks and reservoirs found in different wards of the town. Although heavy inflow of population creates maximum

pressure upon land in this town, but still a major share (almost 11%) of vacant as well as crop lands are used for agriculture and some other primary occupation. For traffic and transportation, numerous roads and streets along with their attendant structures occupy about 6% of the total urban area. The remaining part of the town highlights just above 3% of commercial and business use followed by public, semi-public and private institutions or offices (almost 1.5%). Industrial use of land is very negligible, covering less than 1% of the urban area as the town has no favourable geographical condition for the location of heavy industry. As compared to 2001, the land use pattern of Balurghat town is slightly changed in 2011 with little variations (figure 1.4).

7. Ward-wise distribution of land use

Balurghat actually an over grown village was converted into a municipal town just due to the proximate result of the partition of the country. Therefore, on one hand, the urban characteristics are perceived along the huge central tract within the municipal area, on the other hand, urban characteristics are not fully observed along the considerable peripheral tracts which have been included in the town either for administrative purposes or for the requirement of expansion of the town. The identification of ward-wise land use pattern has been carried

out through a detail field survey manifested a nine fold utilization of land such as—residential, greenery, water bodies, vacant & agricultural, roads, commercial, institutional, industrial and others. This survey has been made during 2011 reflects a slight variation in the land use of the town as it was in 2001 which is stated in table 1.3 and figure 1.5.

The degree of land utilization for residential and other purposes has been measured against the total municipal area and also in respect to the area of different wards which is discussed in the following manner:

(i) Land for Residential and Greenery uses: All the residential dwelling units are bounded by their own concrete or bamboo fencing and most of the units have sufficient space inside the fencing. However, the entire compound where the dwelling is located is treated as residential land which naturally brings out the higher proportion of land under residential uses in respect to the total land allocation of the town. From table 1.3, it is clear that the share of residential land use is found maximum in the wards 4 and 6 while it is the minimum in the ward 12 followed by 7, 10, 15, 23, 3 in respect of their individual areas.

Table 1.3 Ward-wise distribution of land use of Balurghat Municipality, 2011.

Ward No.	Area (Sq. M.)	Residential (Sq. M.)	Greenery (Sq. M.)	Waterbodies (Sq. M.)	Vacant (Sq.M.)	Roads (Sq.M.)	Commercial (Sq. M.)	Institutional (Sq. M.)	Industrial (Sq. M.)	Others (Sq.M.)
1	420000	243600	16800	50400	33600	21000	37800	8400	--	8400
2	530000	286200	45000	79500	42400	42400	13300	10600	--	10600
3	480000	254400	96000	62000	24000	14400	19200	5200	--	4800
4	470000	300800	26000	2500	56400	51700	12000	6500	--	14100
5	480000	292800	48000	14400	52800	38400	19200	9600	--	5000
6	360000	230400	36000	--	36000	25200	21600	7200	--	3600
7	410000	192700	32800	32800	4100	28700	82000	8200	24600	4100
8	380000	197600	30400	26600	57000	30400	15200	7600	3800	11400
9	450000	270000	45000	40500	49500	22500	4500	6750	4500	6750
10	480000	232800	48000	48000	72000	26400	24000	9600	9600	9600
11	340000	214200	30600	64600	10200	13600	3400	3400	--	--
12	520000	228800	67600	78000	104000	26000	--	5200	--	10400
13	460000	276000	55200	46000	23000	27600	20700	6900	--	4600
14	480000	288000	43200	52800	33600	28800	16800	7200	4800	4800
15	530000	254400	63600	68900	53000	16250	13250	31800	26500	5300
16	440000	211200	52800	52800	48400	33000	11000	8800	4400	17600
17	430000	258000	60200	38700	21500	21500	8600	17200	--	4300
18	460000	262200	55200	50600	18400	32200	13800	23000	--	4600
19	450000	247500	49500	40500	54000	27000	13500	9000	--	9000
20	430000	245100	43000	43000	43000	30100	12900	4300	--	8600
21	520000	265200	62400	26000	93600	36400	15600	5200	--	15600
22	510000	265200	76500	76500	30600	25500	15300	5100	--	15300
23	530000	259700	63600	148400	15900	21200	5300	5300	--	10600
Total	10560000 (10.56 Sq. Km.)	5776800 (54.70%)	1147400 (10.87%)	1143500 (10.83%)	977000 (9.25%)	640250 (6.06%)	398950 (3.78%)	212050 (2.00%)	78200 (0.73%)	189050 (1.78%)

Source: Based on field survey

A considerable amount of greenery of this town mainly covers parks, play grounds, open spaces with natural and manmade vegetation which plays a vital role for the healthy and purifying air to the habitants and also provide the benefits of playing, recreation, meetings and social gatherings. Sometimes the play grounds are also utilized as the grazing ground both by the domestic and stray cattle due to lack of

proper maintenance which causing damage to these fields. However, the above table shows the highest concentration of greenery in the wards 3, 12, 15, 17, 21, 22 etc. and it is found lesser in the wards 4, 7, 8, 2, 11, 14 etc.

(ii) Land under Water Bodies, Vacant & Agriculture: The entire Dakshin Dinajpur district is full of several rivers, channels, marshy lands, *dighi* (big reservoirs) and ponds which

reflect its impression upon this town also. A good percentage share of wet lands is found in different wards which not only maintains the balance of ecosystem but also used for fishery purpose. The heavy concentration of wet land is observed mainly in the ward 23 (huge portion of this ward is now under river Atreyee) followed by 11, 12, 3, 14, 15 while the absence of wet land is found in ward 6 and it is very nominal in the ward 4 as these two wards having maximum residential land use.

In spite of heavy pressure on land, still the town has an admissible amount of vacant lands which are either fallow or engaged with some primary economic activities mainly agriculture. The huge share of vacant land is produced by ward 12 followed by 21, 8, 10, 4, 15 etc. On the other side, very least amount of vacant land is found in ward 7 because of various market complexes and several other commercial purposes.

(iii) Land used for Roads and Commercial purposes:

The town depicts a good road network within its territory. The NH-512 is the main 'lifeline' which maintains the connectivity in between Balurghat and the rest of the West Bengal. The railway track is just outside the municipal boundary. However, almost each ward is well connected with the main municipal roads by several lanes and by-lanes. Main roads are made of bitumen (asphalt) while other roads are well pitched; some of the by-lanes are of cement concrete or soling type. A very insignificant amount of *kutchha* (mud) roads are found mainly along the peripheral zone of some wards.

The land used for commercial and business activities are generally scattered and diffused throughout the whole town. Practically, there are only few definite suitable places which are used for market complex and other business and allied activities. People came from erstwhile East Pakistan after 1971 War and settled here, many of them engaged in different commercial and business activities. As a result, they have constructed their shops in a haphazard and unplanned manner mainly along the road side. Due to such encroachment, scarcity of footpaths and lack of parking lots are intensely noticed. However, during the late 1980's some definite places were identified for daily markets by the municipal authority. These are—Mini Market complex (ward no. 10), *Baro Bazar* (largest market of Balurghat, ward no. 7), Power House Market (ward no. 15), *Jogomaya Market* (ward no. 14), Chak Bhabani Market (ward no. 19), Weekly *Hat* (once in ward no. 3), Weekly Bazar *Monimela* (twice in ward no. 18) etc. A big space for garments (Tahabazar) and other remarkable clothing shops are located in ward no. 7. Beside these, the biggest market of grocery items is also situated in this ward. Practically the highest share of land use for commercial and business purpose is concentrated in ward 7. Though there are found more or less almost all kinds of shops along the both side of roads in every wards.

(iv) Land for Institutional, Industrial and Other uses:

The institutional land use includes the land under administrative, public, semi-public and private sectors like—Collectorate Building, S.D.O. and B.D.O.'s office, Municipal office, Hospitals and Nursing Homes, Schools and Colleges, Electricity, Water supply, Bank, Govt. Bungalows and other

Govt. Offices; several social, cultural and religious buildings, clubs, flood shelters, *utsav bhawans*, community halls etc. Ward no. 15 and 18 share the highest percentage of such kind of land use due to the presence of numerous office institutions. The pictures in the rest wards are very nominal.

The industrially backward district also keeps its imprint upon this town. Only some rice mills, oil mills, saw mills and brick fields are found in a limited part of few wards. Ward nos. 7 and 15 having the maximum share of industrial land use, while a negligible amount is shared by the wards 8, 9, 10, 14, 16.

Land use of others category included embankment, lock gate, PHE water reservoirs, street stand posts, tube well, urinal, vat etc. which reveals the more or less same picture in each wards. Though it is slightly high particularly along the wards those are situated by the river side or adjacent to the *Danga Khari* due to the purpose of embankments.

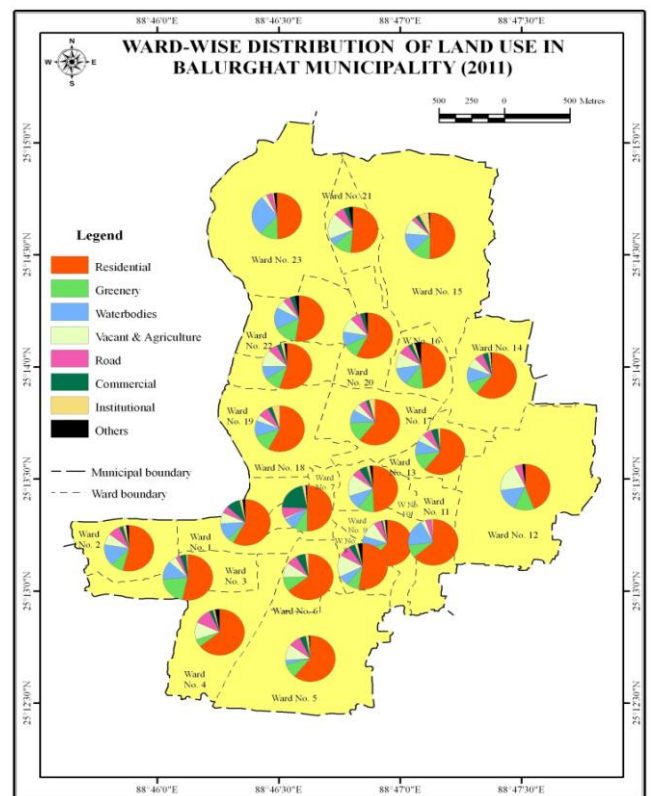


Figure 1.5 Ward-wise land use share in Balurghat Municipality.

8. Relative changes in past and present land use

The urban fabric of Balurghat town was essentially rural in nature up to the end of 1970's decade. Most of the town was full of low lying areas, marshy lands, jungles and scrubs. During the time of Independence, West Dinajpur district was formed with its headquarter at Balurghat town which attracted large number of people from various spheres of activities. Government servants, doctors, teachers, traders, lawyers came from different parts of Bengal (both East and West) during that early stage and settled in the town. These early settlers were supposed to select and share the elevated tracts of the river Atreyee and its tributary *Danga Khari* levees for residential purpose with the original people of Balurghat. However, most of the official, residential, commercial and

business houses were of *kutch*a type either with tin or thatched roof. Not only that, condition of roads was very poor, narrow and non-metal. At that time, there was no scientific drainage system, sewerage was traditional and unhygienic. Service-privies were found here and there. Practically, there were no basic urban services from the municipality.

Balurghat experienced a phenomenal growth just before and after the Liberation War of Bangladesh (1971) and a drastic change has been noticed in the land use pattern of the town by the transformation from agrarian to urban look. As the

river Atrayee restricts the urban growth towards west, the evacuees had no other option but to convert the low marshy lands, wetlands, numerous abundant river channels, jungles, paddy fields etc. into their homestead. On the other hand, since 1980 the continual flow of rural people from the neighbouring as well as from vast rural tracts of the district is uninterrupted till date basically for security, better standard of living and job opportunity. Thus, the town experienced phases of unplanned development with the immediate result of the transformation of land use pattern that have taken place particularly during the latter part of the last century.

Table 1.4 Comparison of land use distribution in Balurghat Town.

Land Use	% of Area		
	1995*	2001*	2011 [#]
Residential	36.00	54.55	54.70
Greenery	13.90	11.98	10.87
Water Bodies	14.00	11.03	10.83
Vacant/Agriculture	16.00	10.98	9.25
Roads	8.00	5.97	6.06
Commercial	4.00	3.12	3.78
Institutional	7.60	1.42	2.00
Industrial	0.50	0.95	0.73
Others	--	--	1.78
Total	100.00	100.00	100.00

Source: *Balurghat Municipality, [#]Field Survey.

From the above table, it can be easily compared about the land use pattern of Balurghat town throughout a period for more than 15 years. There is no denying that the residential land use is consistently the prime like other towns of North Bengal. It has increased to almost 55% in 2011 than that of 36% (1995) and 54.55% (2001) respectively which indicating the fact that the growth of population is still increasing pressure on residential land use. Once upon a time, Balurghat was full of jungle and forests as described by Strong (1912). Even up to 1950-60's decade, there was plenty of vegetation. But after Independence and then after 1971 war, huge migrants and heavy influx of refugees came to this town and settled here permanently. As a result, it became necessary to remove a considerable portion of vegetation for their livelihood i.e. for the expansion of agriculture, residence, trade and commerce, roads etc. It is clearly depicted by the table that a gradual loss of vegetation is found in the last two decades. The number of parks, playgrounds and open spaces are adequate in this town but the amount of both natural or man-made forests are almost nil within the municipal territory.

A gradual decrease in the amount of wetland is also noticed as because of maximum residential use of land. Existing land amount could not able to support the excessive population after 1971. Therefore, many of the big ponds, marshy lands, abundant river channels, *Danga Khari* bed etc. were converted into residential and other land use. Prior to the 1970, agriculture was one of the major economic activities in and around Balurghat town. Since 1980, a large number of people shifted from agrarian economy to non-traditional occupations like trade, commerce, government jobs etc. So, vacant as well as fallow grounds which were adequately

available just only 10 years ago recently have been converted mainly into residential purpose.

During the first half of the 1990's decade, a good share of road network is observed from table 1.4. But a large portion of road was under *kutch*a or non-metal type. Later, though the main road network of the town is not changed too much, but during 2001 the available data proved that the percentage share of land use under road category is decreased probably due to the encroachment of residential or shopping houses upon the roads as felt during the field survey. Few roads are now non-existent. In 2011, the sharing of road network is slightly increased as because the municipal authority has made some new approach roads, bridges etc. and also due to removal of illegal encroachment from the roads in some parts. Presently, more than 95% of existing roads are under metal, cement concrete or soling type. Existence of *kutch*a roads is very negligible. The commercial land use of the town maintains parity as depicted by the above table. Though it was slightly reduced in 2001 but again slightly increased in 2011. This is probably due to the reason that government jobs are very limited nowadays, so a major share of the young generation is trying to establish in different sectors of commerce and business.

A sharp decrease in institutional land use from 1995 to 2001 is found from table 1.4, though it slightly increased in 2011. Previously most of the government offices were found scatter here and there with their rented private houses. Now most of them have come under one roofed building complexes which are concentrated only in few wards. The industrial use of land is found very negligible though it was increased in 2001 due to the establishment of many rice mills. But it again

decreased in 2011. Because some of these rice mills are now closed as presently the government has stopped the export of rice to Bangladesh.

Land use of others category as perceived from field survey mainly shows the presence of embankment, lock gate, PHE water reservoirs, street stand posts, tube well, urinal, vat etc. Not only that the municipal authority now doing the strong embankment on both the banks of the *Danga Khari* by mud, boulders, cement etc. as well as trying to strengthen the weaker section of Atrayee embankment to protect bank erosion during the flood.

9. Effect of land use changes on human habitation

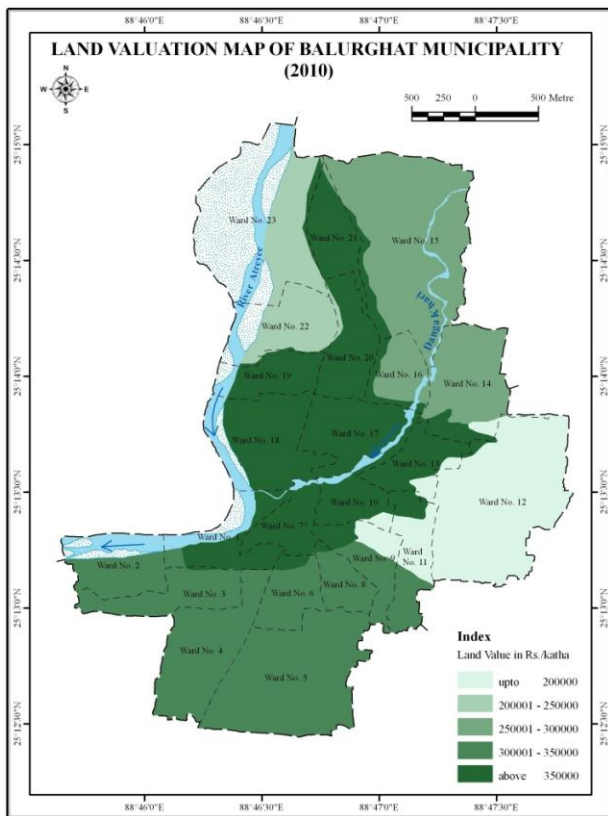
The effects of the changing pattern of land use in Balurghat town are manifold:

As the population density is continuously increasing, the land value is also abruptly increasing in recent times as experienced from the field survey and information received from the A.D.S.R, Balurghat (figure 1.6). Not only that the availability of residential land is becoming scarce day by day

and nowadays the constructions of multistoried flats are observed here and there.

Again, another important fact is that previously many low lying parts, marshy lands, wet lands, abandoned river channels of the town which were the container and free passage of excess water during monsoon, now converted into residential land use. As a result, most of the town facing the problem of water logging during heavy downpour. It is revealed during field survey that the densely populated wards are basically more affected by water logging problem. This also suggests that the human factor has definite responsibility in causing drainage congestion in the town.

Though parks, playgrounds and open spaces are adequate in Balurghat, but the town has not any forest area within its territory. Old big trees are very limited in numbers and many of them cut down during the expansion and widening of the main roads. These not only give us the fresh and healthy air, also maintain the ecological balance. Again trees are the means of food and lodging places of birds and other animals and insects. So, destruction of greenery causing hamper to the bio-diversity also.



Source: A.D.S.R, Balurghat.

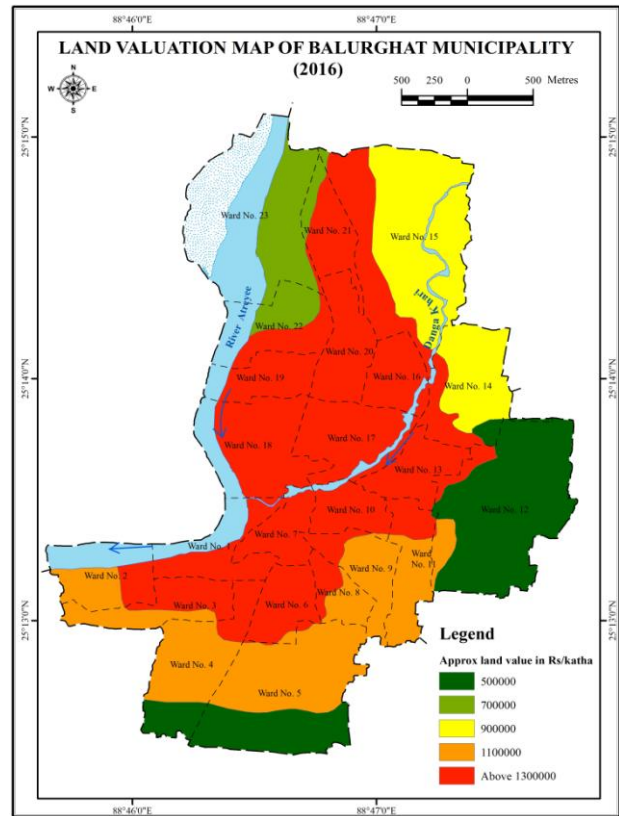


Figure 1.6 Comparative land valuation map of Balurghat Municipality.

Balurghat town is famous for fish cultivation and the town has plenty of water bodies including river Atrayee and *Danga Khari*. But the real picture is not so hopeful. Many of the big ponds are filled up for the residential and other purposes. The *Danga Khari* is the main passage for the daily pollutants of the whole town which leads to the eutrophication of this channel. It was one of the main suppliers of different species of fishes in the recent past. Since 1965, the evacuees from East Pakistan started to occupy low lying parts, *khari* and river beds as the means of their livelihood. Thus, a new dimension of human

occupation in the already decaying drainage system in Balurghat and its environs started. But the river Atrayee has lost its depth due to heavy siltation which makes it emaciated during dry season and causing over flow during rainy season. Similarly, the Atrayee getting polluted regularly by human interferences and the River has already lost several kinds of tasty small fishes which affecting the means of livelihood of the fishermen lived along the river side.

Vacant places are very limited in the central part of the town. A good portion of vacant as well as fallow lands are available in the peripheral zones particularly in the N-En, En, S-Wn and Southernmost parts of the town. The agricultural work is very restricted in these parts because the people who engaged in agriculture during recent past were left for other states in search of new jobs, while some of them working either as daily-labourers in the town or engaged as rickshaw, auto- rickshaw and e-rickshaw drivers and several other kinds of jobs. Some of the female are now working as maids in different houses.

Roads in Balurghat town are very narrow and zigzag in nature. Practically it is a footpath less town because of illegal encroachment by different houses and shops along the roads. Some efforts have been made by the Municipality in different times to remove such illegal construction but the overall scenario is not so desirable.

Balurghat is known as a pollution free town due to the absence of heavy industry. The agro- based industries like rice mills, saw mills, oil mills and brick fields are noteworthy which cause less pollution. But it is perceived during field survey that the wastes of rice mills making foul odour in the dense settlement areas and causing congestion on the free flowage of the drainage system. In the N-En part, brick fields are causing continuous pollution to the air as well as their ashes making a cover upon the nearest vegetation.

10. Conclusion

The land use mapping of towns has become a popular practice only recently and particularly after the Second World War, when the need for planning and replanning of towns was universally felt (Dube, 1966). The practice of mapping of towns

for economic purposes, however, is not new and Balurghat is no exception of it. With the passage of time Balurghat grew very rapidly not only in terms of population but also in its urban fabric. Introduction of good quality of road transport and rail communication with the rest of the country brought more socio-economic prosperity for the town. Simultaneously, it is desired that the vast rural hinterland of Dakshin Dinajpur District will open more opportunities for Balurghat to have its considerable infrastructure of trade and commerce in the coming future which will surely make the further shaping of the urban land use. There is still plenty of developable land available in and around the existing town area. Naturally, the available physical infrastructure can sustain more population, though not in a very desirable quantity. The town being an urban centre, within a large track of interior rural region, is likely to have a pull factor on the surrounding villages for urban facilities, services and job opportunities.

The future growth will have to depend mostly on tertiary economic activities and marginally on small scale industries. This is true that a sincere effort will have to be made deliberately to induce the industrial activities on the basis of available raw materials from agricultural as well as marginal forest products. However, considering the past growth trend and future prospect of population of this town, provisions will have to be made for additional land for future land use including filling in the gaps of existing shortage in infrastructural conditions.

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