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## **Urban Sprawling and Structural Changes: A Case Study in the 10 Km Buffer Area of Burdwan Municipality**

**Jagannath Guin**

Assistant Teacher, Department of Geography, Nabadwip Hindu School, West Bengal, India

### ***Abstract:***

*Urban sprawl is a worldwide phenomenon. In developed countries about 3,000 sq Km area of agricultural land is covered every year by urban growth. Burdwan municipality is the core town of Burdwan district. Urban sprawling takes place rapidly during the year 1971 – 2001 to its surrounding villages which are mainly under the buffer area of 10 km from Burdwan Municipality. Urban sprawling in the Burdwan municipality area creates the structural changes like household density, population density, literacy rate and primary occupation to its surroundings areas. The present paper deals with the study of Urban Sprawling and Structural Changes in the 10 km buffer area of Burdwan Municipality.*

*In order to study the spatial pattern and extent of sprawl over the time period of 1971 – 2001 Topographical sheets of 73 M/15 and 73 M/16 of 1964 has been used and satellite images were taken from IRS – ID LIIS III data of 2001 and 1990 which were merged with Pan image of the same year and time. Various demographic facts were collected from Census Reports (1971, 1981, 1991, 2001) and other Governmental reports. Sprawl has been delineated applying slicing method on different satellite imageries of IRS – ID LISS III.*

*The study throws a very interesting and clear picture of urban development in and around of Burdwan Municipality. The changing face of urban agglomeration and structural changes set an example of urban transformation of rural villages.*

***Keywords:*** *Burdwan municipality, household density, literacy rate, population density, primary occupation, urban sprawl*

### **1. Nature and Pattern of Urban Sprawl**

Burdwan (also Bardhaman ;), is a city of West Bengal state in eastern India. It is the headquarters of Burdwan District. Burdwan has been a district capital since the time of Mughals. Later on it became a district headquarters of British India. Burdwan is an alternative name for the city, which remains in use since the British period. The area which has been taken over for the present study is Burdwan Municipality and surrounding 10 km buffer area.

C.D. Block	Name of Panchayat	Name of Revenue Village/ Census Town	J.L No.	C.D. Block	Name of Panchayat	Name of Revenue Village/ Census Town	J.L No.
<b>BURDWAN - I</b>	<b>BAGHAR-II</b>	TALIT	10	<b>BURDWAN - II</b>	<b>BAIKUNTHAPUR-I</b>	KALYANPUR	71
		CHANDUL	14			NANDARA	72
	<b>BELKASH</b>	JHINGUTI	15			DANGACHHA	73
		NABABHAT	16			BAMCHANDIPUR	74
		ISUFABAD	17			KANDARSONA	86
		KHARGESWAR	23			GANGPUR	88
		IDILPUR	24			JOTRAM	89
		FAKIRPUR	25			BAIKUNTHAPUR	91
		KANCHANNAGAR	26			ASWATHAGARIA	92
		BIRUTIKRI	27			NAOPARA	93
		KATRAPOTA	28			SYAMSUNDARPUR	94
		BONGPUR	32			ICHHLABAD	75
	GODA	41	KANAINATSHAL			76	
	<b>KSHETIA</b>	KAMNARA	49			ALISA	77
		MALKITA	54		GOPALNAGAR	78	
	<b>RAYAN-I</b>	RAYAN	68		BECHARHAT	79	
		SADHANPUR	69		SRIRAMPUR	80	
		NARI	70		HATSIMUL	81	
		KANTIA	95		PAMRA	82	
	<b>SARAITIKAR</b>	NUTANGRAM	12		KANTHALGACHHI	83	
		AMAR	13		CHAITPUR	84	
		BAHIR	42		AMIRPUR	85	
		SARBAMANGALA	43		NANDUR	87	
		KRISHNAPUR	43				
		JOTGODA	44				
		BIDCHHALA	45				
		SARAITIKAR	46				
		PALITPUR	47				
DIURI		48					
MIRZAPUR	66						

Table 1: List of the Villages in 10 Km Buffering of Burdwan Municipality.  
Source: Primary Census Abstract, District Burdwan, 2001

Burdwan Municipality was established in the year 1865 though its urban entity came in 1657. At that time the municipal area was 12.8 sq km. with a population of 39818. As per the 1991 census the population and area of Burdwan Municipality was 2, 45,000 and 13.03 sq. km. respectively. And in 2001 the population and the area was 2, 85,602 and 23.04 sq km. Although Burdwan city has grown over centuries in various phases. But in the present study its process of sprawl has been examined during 1971 to 2001. The process of sprawl has been discussed in two phases depending upon the availability of data and material. These are Phase I during 1971-1991 and phase II during 1991-2001. A discussion of each phase is given below.

#### 1.1. Urban Sprawling During 1971 – 1991

With the information of toposheet no. 73 M/15 and 73 M/16, there have seen some little urban sprawling in the year of 1964. The urban sprawling was mainly Ribbon type because sprawling was happened according to the main road side. The expansion of the city was in all direction but largely towards the north & east. This was primarily the result of the concentration of industries, jobs and other services. There had some ribbon sprawling along the GT road side at Gopalnagar and kanainatsol. Low density sprawl towards the central part of Rayan and to the north side along the railway ribbon sprawling have been seen.

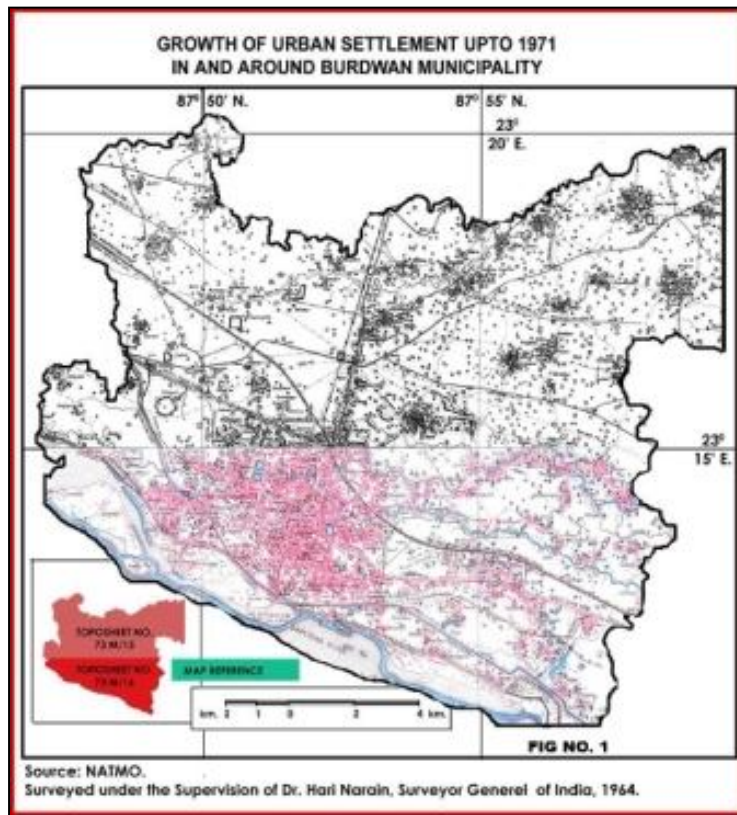


Figure 1

During this period the urban sprawling was not uniform in all direction. The village land was acquired mainly to provide for necessities of expanding city. In the satellite imagery of 1990 it seen that the urban sprawling was in the east and west direction. The most ribbon sprawling was seen towards the eastern side in the Nandur, Gangur, Pamra and Alisa village. In the western side towards Kanchannagar and Khargeswar some ribbon sprawling developed. There have also some leap fog sprawling to the northern side at Mirzapur village. In the Sadhanpur and some parts of the Rayan village there have seen low density sprawl according to the boundary of Burdwan Municipality.

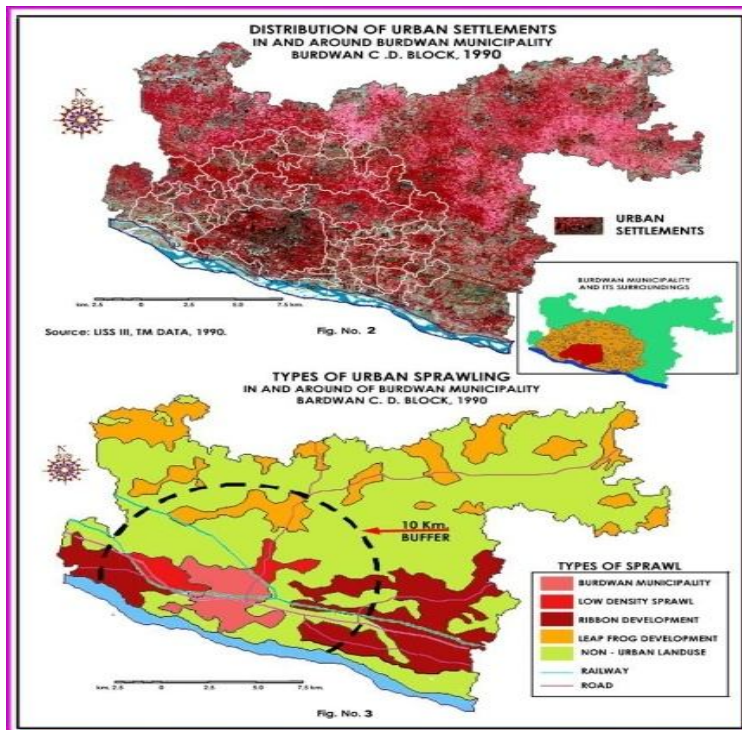


Figure 2

### 1.2. Urban Sprawling During 1991 – 2001

During late 1990's the extension of urban sprawl of city was inhibited. And the changed have been seen in the satellite imagery of 2001. The urban sprawling was took the new dimension after the year 1991. In 2001 it's seen that there have higher growths of urban sprawling. The urban sprawling was in all direction around the Burdwan Municipality. The eastern sector witnessed tremendous sprawl because of increasing number of people opting for better residential spaces and higher living standards. The Govt. of West Bengal is trying to bring in many new projects to facilitate the growth of Burdwan Township. Two large developments on a Public Private Partnership are coming up on the NH 2 connecting Kolkata and Delhi, on which Burdwan town lies. One of these is a Bus Terminus, with retail and other hospitality services. The other is a Mini Township at Goda, Burdwan. Also on the highway, this 250+ Acre mini township is being Developed by Bengal Shracchi Housing Dev. Ltd. It will revolutionize the way people see residential units in Burdwan. The Burdwan Development Authority is also playing a big role in these PPP projects.

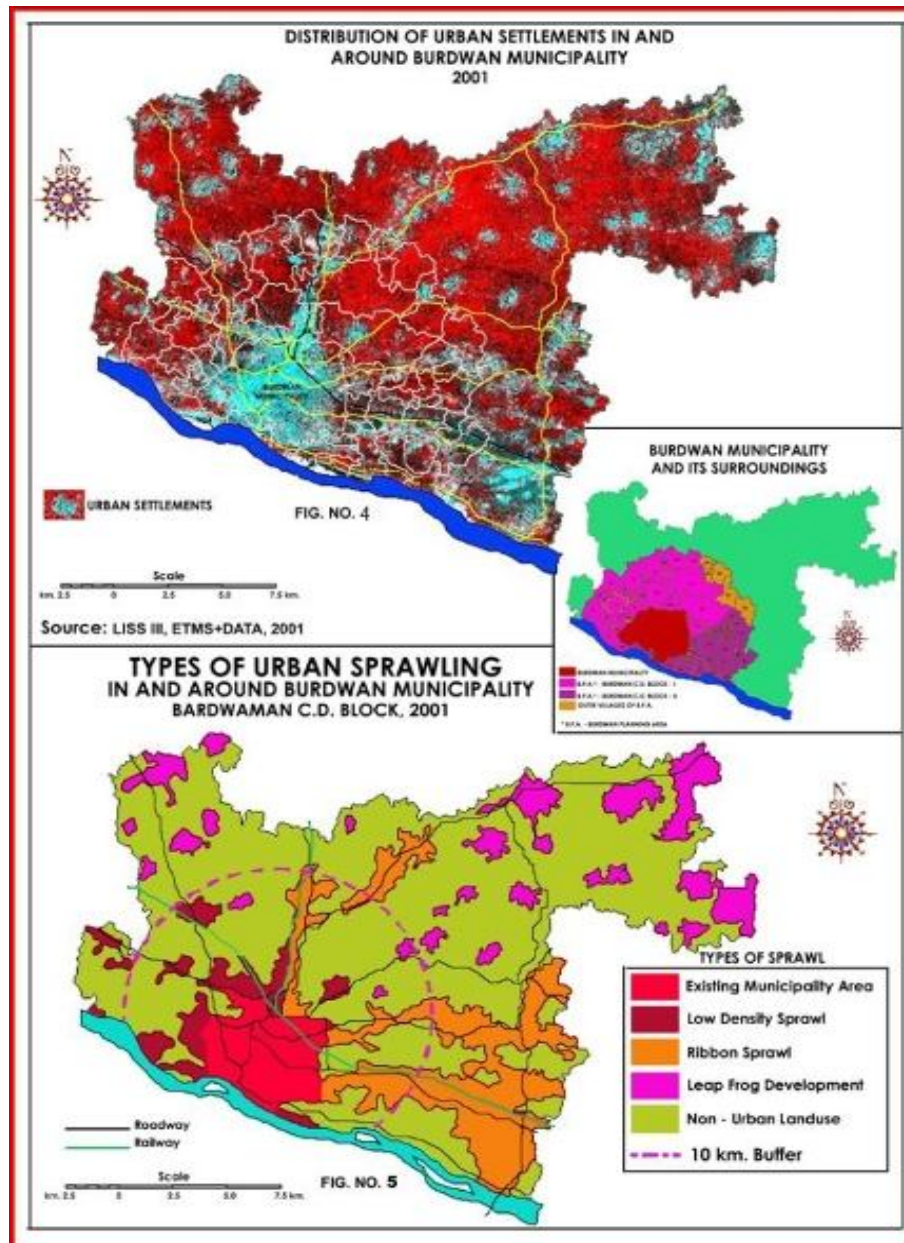


Figure 3

### 2. Structural Changes Associated with Urban Sprawl

The story of land use change and acquiring land use for Burdwan city is quite similar to the stories of other cities undergoing planned industrialization followed by urbanization process like Jharia in Jharkhand, Raniganj and Durgapur in west Bengal, Korba in Chhattisgarh, Singrauli in Uttar Pradesh, Singareni in Andhra Pradesh and Chandrapur in Maharashtra. Urban sprawling in the Burdwan municipality area creates the structural changes to its surroundings areas.



2.1. Changes in Population Density

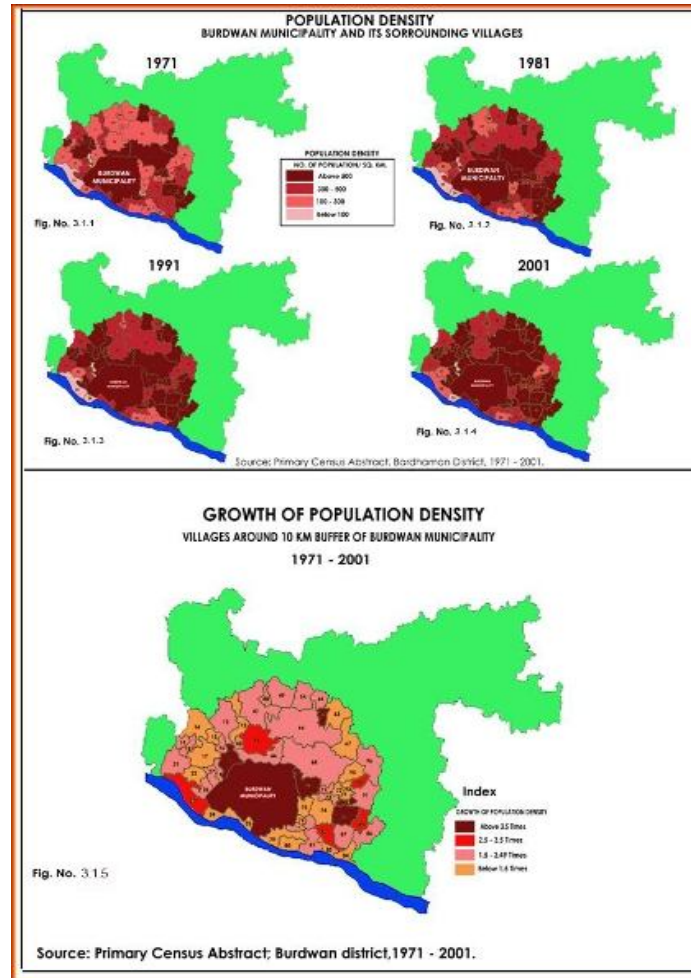


Figure 4

Population density which has a great role for the changing scenario of urban sprawling also changed with the time. It depends on population growth because land cannot be increase, only the population of it can be increased. Increasing of population means increase the population density. With the urban sprawl the surrounding area of Burdwan Municipality population density also have been changed from 1971 to 2001. In 1971 there were only 15 villages (*GOPALNAGAR, JAD GODA, KANDARSONE, MATIAL, ISUJABAD, RAYAN, JHINGUTI, ASWATHAGARIA, NABAHAT, JAMAA, KALYANPUR, JATRAM, GANGRUR, MALKITA*) which population density was above 500 population/ sq km. In 1981 it changed well. 8 more villages are added in the 1<sup>st</sup> category. In 1991 there were total 32 villages which population density was above 500 populations/sq km. JAD GODA has the highest population density of 2027 population/sq km. Most growth has been seen in NARI, almost above 3 times. Besides that, it has been observed that other village’s population density increase reasonably with the change of time. In 2001 the highest population density has been seen in the ASWATHAGARIA village which population density was 3294 population/ sq km. Also rapid changes have been seen in the GOPALNAGAR, JAD GODA, NARI, and GANGUR which population density was above 2000 population / sq km. In 2001 there was 37 village of above 500 population density.

- Bardwan – I (part) and Burdwan-II (part) blocks show higher Population growth (37.8%) since 1981.
- Burdwan Municipality grew at a high rate (46.43%) during 1981 – 91; during 1991 – 2001 growth rate has fallen [16.53%].
- Cumulative growth of total area has (44.2%) during 1981 – 91 and [21.69%) during 1991 – 2001.

Population Density	No. of Villages			
	1971	1981	1991	2001
Above 500	15	23	31	37
300 – 500	17	24	17	13
100 – 299	21	06	05	04
Below 100	03	03	03	02

Table 2: Changes in Population Density from 1971 – 2001:

Source: Computed By Author From Primary Census Abstract, District Burdwan.

The growth of the villages around Burdwan Municipality is very much high because the influence Burdwan Municipality and its rapid sprawling towards the outer part of its. The much higher growth rate has been seen in the NARI village which growth rate was above 7 times from 1971 to 2001. Besides that ASWATHAAGARIA, RAIPUR, GODA, GANGUR also have the highest growth rate above 4 times. In the growth stage there have been seen that there are 6 village- IDILPUR, KANAINATSOL, CHANDUL, JACHHALABAD, DECHARHAT, BAHARPURR which growth rate was much lower below 0.3 times. Besides that it seen every village's population growth was much respectable.

2.2. Changes in Household Density

Changes in house hold density also have been seen due to urban sprawling in the surrounding area of Burdwan Municipality. In 1971 there were only 11 villages (GOPALNAGAR, JAD GODA, NANDARA, RAMCHADIPUR, ISUJABAD, ASWATHAGARIA, RAYAN, KANDARSONE, MATIAL, KALYANPUR, JHINGUTI) along with Burdwan Municipality which house hold density was above 100. In 1981, 17 villages were in that category. There were rapid changes in the Nari village which household density changes to 101 from 54. In 1991 the household density was increased at Jad Goda village which house hold density was 404. SHYAM SUNDARPUR, PAMRA, GODA, NANDUR, MALKITA, BIDCHHALA, KANCHANNAGAR, KASHIMPUR, JAMAA are also were came in that category. BIDCHHALA village which house hold density was in the 3<sup>rd</sup> category in 1981, came into the 1<sup>st</sup> category in 1991. Most changes happened in house hold density in 2001.almost most of the village came in the 1<sup>st</sup> category. In 2001 ASWATHAGARIA had the highest house hold density, which growth was maximum- above 4 times. Beside these 11 more village's house hold density changed into the above 100 category.

Household Density	No. of Villages			
	1971	1981	1991	2001
Above 100	11	17	26	37
75 – 100	07	11	12	07
50 – 74	18	19	10	07
25 – 49	13	05	04	03
Below 25	07	04	04	02

Table 3: Changes in Household Density From 1971 – 2001

Source: Computed By Author From Primary Census Abstract, District Burdwan.

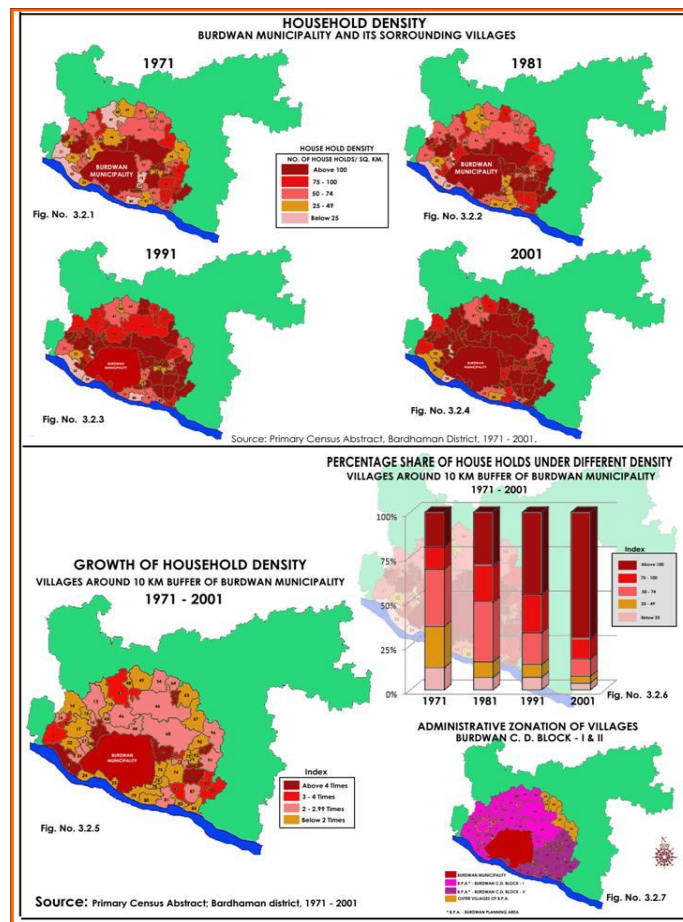


Figure 5

2.3. Changes in Literacy Rate

Literacy rate is also one of the major factors which can determine the structure of any village or city. Higher literacy rate can develop any region and other infrastructures can build over these. But the lower literacy rate cannot develop any region and for that it is important so much for the urban sprawling.

Literacy Rate	No. of Villages			
	1971	1981	1991	2001
Above 60	01	00	06	26
40 – 59	06	20	35	25
20 – 39	31	27	14	02
Below 20	18	09	01	03

Table 4: Changes in Literacy Rate from 1971 – 2001

Source: Computed By Author From Primary Census Abstract, District Burdwan.

In 1971 there was very low literacy rate in the villages around Burdwan Municipality. Only in the JHINGUTI village there was literacy rate above 60 percent and in NARI village there have seen the literacy rate above 50 percent. And rest of the above the literacy rate was below 42 percent. In 1981 there have seen 5 villages which literacy rate was above 50 percent. In 1991 the growth of literacy rate was improved. The highest literacy rate of 72 percent, has been seen in the NAOPARA village. There have seen 5 villages (JHINGUTI, RAIPUR, NABAHAT, ISUJABAD, and DANGACHHA) which literacy rate was above 60 percent and 11 villages have the literacy rate above 50 percent. The most growth in literacy rate has been seen in 2001. The highest literacy rate was 77 percent in the SRIRAMPUR which literacy rate was 40 percent in 1991. There were 6 villages (RAMCHADIPUR, JHINGUTI, KANCHANNAGAR, GANGUR and BASATPUR) which literacy rate was above 70 percent. There were also 20 villages which literacy rate was above 60 percent. And rest of the villages also well improved in literacy rate. So from 1971 to 2001 it is seen that the literacy rate in the surrounding villages has been changed rapidly.

It justify that the impact of Burdwan Municipality and its sprawling create the positive growth in literacy rate in the surrounding villages of Burdwan Municipality.

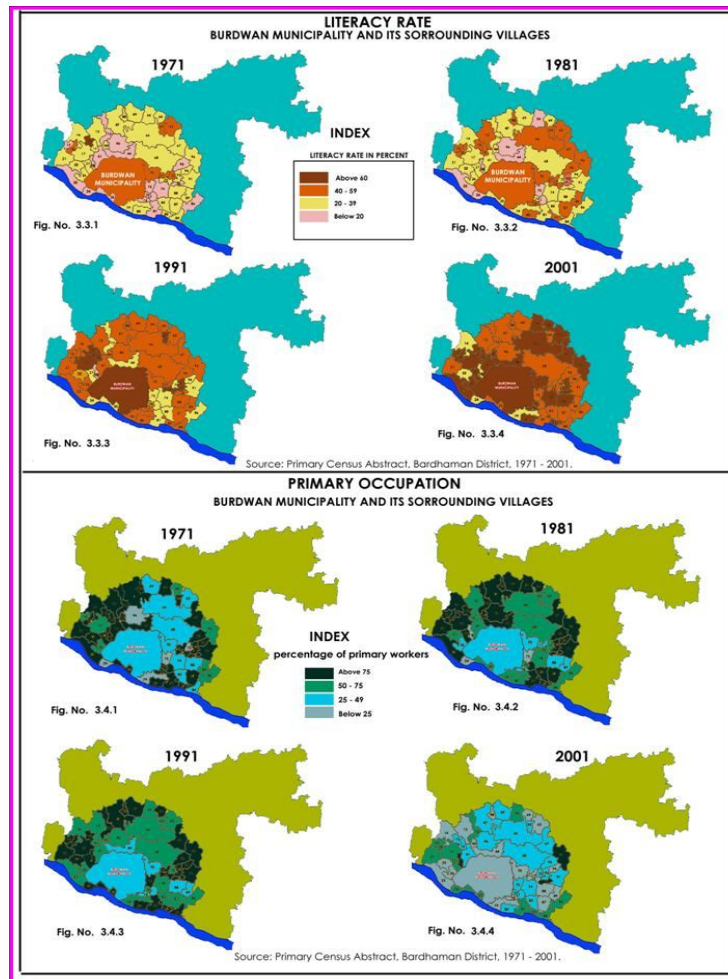


Figure 6

#### 2.4. Changes in Primary Occupation

Primary occupation is the major occupation of any village. If the primary occupation changed into secondary or tertiary the region grows towards the urbanization. According to the census of India one of the criteria of the town should be the primary occupation of any region must be above 75 percent.

Percentage of Primary Workers	No. of Villages			
	1971	1981	1991	2001
Above 75	34	30	30	03
50 – 75	07	17	20	14
25 – 49	10	06	06	20
Below 25	05	03	00	19

Table 5: Changes in Primary Occupation Structure From 1971 – 2001  
Source: Computed By Author From Primary Census Abstract, District Burdwan.

In 1971 primary occupation was the only main occupation of most of the villages around the Burdwan Municipality. There were 19 villages which 100 percent working population were engaged in primary occupation. Beside that there were 22 villages which have less than 75 percent working population were engaged in primary occupation. In 1981 it changed some quietly. There was only one village which 100 percent population engaged in primary occupation. Beside that 30 villages have primary occupation above 75 percent of working population. The most changes have been seen in KALYANPUR village which primary occupation was 100% and changed into 44%. In 1991 there was some little change in primary occupation because in this year also 30 villages have the primary working population above 75 percent. But the huge change has been seen in 2001. There have only 4 villages which primary working population was above 75 percent. Only KATRAPOTA village have the 100 percent primary working population. There have seen less than 10 percent primary working population in GOPALNAGAR, NARI, KHAIDMA, KALYANPUR, SHYAM SUNDARPUR, DANGACHHA, BAHARPUR, DECHARHAT AND CHANDUL village. So the changes from 1970 -2001 suggested that every village is going under the way of urbanization.

#### 3. Concluding Remarks

The study throws a very interesting and clear picture of urban development in and around of Burdwan Municipality. The changing face of urban agglomeration and structural changes set an example of urban transformation of rural villages. Some of the striking findings are described below;

- Urban sprawling taking place rapidly during 1991 – 2001 with the collaboration of Burdwan Planning Authority and most of the villages are taken by the Authority are mainly under the buffer of 10 km from Burdwan Municipality.
- Mainly Leapfrog development and Ribbon development were the basic trend of urban sprawling within buffer of 10 km from Burdwan Municipality. Due to the presence of Eastern railway, National Highway and furthermore the development of Bypass nearby Housing complex (Ullhas and others).
- Population density one of the major aspects of structural change associated with urban sprawling having an exceptional result. Some of the villages having experience 3.5 times of density growth during the period of study (i.e. 1971 – 2001).
- Household density also changes within the time span of 1971 – 2001. The share of highest class of household density (Above 100 households/ sq. km.) was near to 30 percent in 1971 which changes into above 75 percent in 2001. So, the changes during 1971 – 2001 were extraordinary.
- Level of literacy is also increasing during 1971 – 2001. The number of villages having more than 60 percent of literacy level was 01 in 1971, but in 2001 it were 26. .
- In respect of primary workers the change has been found during 1971 – 2001 was very interesting. Most of the villages having less than 75% of primary workers were changing its occupational structure in 2001.

#### 4. Acknowledgement

Today it is my pleasure to prepare my paper on 'URBAN SPRAWLING AND STRUCTURAL CHANGES: A Case Study on the 10 km Buffer of Burdwan Municipality' which could be completed after crossing many steps.

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