# Spatial and Economic Changes in Asansol, 1951-2001

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# Preface

Asansol, located in the western part of the Barddhamaan district, is one of the important urban centres of West Bengal. It started as a railway junction in the middle of the nineteenth century but consequently became the focal point of the Raniganj coal-belt. With the abundance of coal in its surrounding areas and iron-ore from Chhotanagpur area led to the establishment of the first iron and steel factory in Kulti and Burnpur. Agglomeration factors worked and colonial economic demands soon transformed Asansol into a industrial-cum-transport hub in the western part of Bengal. At the time of independence, Asansol-Raniganj area was one of the premier industrial regions of the country. In the post-independence period, the region enjoyed the benefits of the planned growth in the country. The Damodar Valley Corporation, Chittaranjan Locomotive Works and Durgapur Steel Plant were the three public sector projects, established and started functioning in the fifties shaped the economy and the subsequent growth of the region. In the sixties of the last century, when the other parts of the state and the country were suffering from industrial recession, Asansol was more or less, remained unaffected. The next decade saw the nationalisation of the coal sector and the grip of the public sector tightened in the area. But the area lost its initial advantages in coal and steel because of the freight Equalisation Policy of the Government of India, The private enterprises could not cope up with the political unrest in general and labour troubles in particular, along with industry-specific causes like shift in demand, changes in raw material composition and most important of all being lack of modernisation in machineries. The nineties ushered the age of globalisation along with liberalisation and privatisation. This region also took the advantage of that and tertiary sector has become the most important component of the economy here.

This particular paper by Mousumi Ghosh traces the changes in the Asansol city in the post-independence period. This is compiled from her doctoral thesis submitted to University of Calcutta in 2009.

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Dr. Mahalaya Chatterjee
Director
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# Spatial and Economic Changes in Asansol 1951-2001

## 1. Introduction

Man's creation of organised space is an economic activity. The ways in which people use space sometimes result in certain built spaces being permanently devoted to particular uses, while certain other may experience a variety of uses at different times. Space is thus like any scarce commodity and every human use of space has economic implications. To assess the importance of these spatial and economic interactions, we need to know the spatial requirements of various activities in terms of their locations. It is especially relevant for an urban area. An urban area is defined as an area with a relatively high population density in comparison to that in a rural area. Unlike in the villages, there is little or no trace of primary activities in a city. It is the hub of various secondary and tertiary activities. These activities can be carried out more easily or profitably in one space than in other. So in every town, almost all pieces of land or in other words the physical space is a built space. Its utilization depends on one or more decisions. Thus any town or a city is unique in its built space. However, if the decisions had been taken place at different times and if different groups of people had been party to such decisions, the spatial and economic interaction pattern might become different.

Asansol city in the western part of the Barddhaman district in West Bengal, for example, is a model of a city which owes its existence to a spatially concentrated mineral deposit, coal. It is the nodal centre of the vast Raniganj coal belt. Coal is the chief resource which initiated the process of capital circulation in this region. Consequently, Asansol is an important railway junction station in eastern India connecting it to the northern and south eastern part of the country. Very few cities in India and no other places in West Bengal have such juxtaposition of natural and built space like collieries, agricultural lands, villages as well as very important rail and road networks, junction rail station, basic and heavy industries and different ancillary industries and a bustling trade and transport centre. Asansol thus seems to be the space where the factors like comparative advantage, scale economies in transportation, and agglomerative economies played a positive role in its urbanisation process. Moreover welfare maximising public sector industrialisation policy of the country during the early five year plan periods in the post independence period played a considerable role here, generating new hopes of urban development.

India gained independence on the 15th August, 1947. Thereafter, the economic policy of independent India was evolved accordingly to serve the interest of her people. As a consequence, the ownership of the collieries changed hands to indigenous entrepreneurs. The industries were confined mainly in Asansol, Kulti, Burnpur and Raniganj. Asansol was the largest town of them. Further, after independence, the exigency of revamping the railways called for a locomotive works. The construction of a locomotive factory was

started as early as in 1948 at Chittaranjan, 30 kms away from Asansol, since both steel and coal were available there in West Bengal.

India spelled out its first resolution on the Industrial policy in the year 1948. Accordingly, the year 1951 saw the beginning of the First Five Year Plan. Thus 1951 became the point of initiation and we seek to trace the spatio-economic changes in the Asansol city from 1951 till 2001. Along this time scale the economic policy of our country has changed its course significantly at least twice in 1971 and 1991.

The main purpose of our study is to examine the interactions between spatial and economic changes in the Asansol city during the post independence period. The present work aims to incorporate both space and time to study the interaction process between economic forces and spatial changes. Specifically our objective is to analyse the intra city location pattern by ward level study for determining the nature of land use in land. Consequently, the whole period is divided into

   i)   Pre-Nationalisation period-1951-71;

   ii)  Post-Nationalisation period - 1971-1991; and

   iii) Post-Liberalisation period- 1991-2001.

There has been a considerable volume of useful studies available for understanding the various facets of the process of urbanisation. Among them, the analysis of the growth of small and medium towns in West Bengal (Giri, 1988) and a case study of Durgapur (Basak, 1988) are immensely valuable for our study. The first one contributed significantly to develop our knowledge regarding the industrial-urban development of Asansol and Durgapur subdivision of Barddhaman district based on mining and mining based industries during the 1951-1981, which is part of our study period, Basak's paper contributed notably to understand the nature of growth process in steel town Durgapur and its spatial impact on the surrounding region. Further, her extensive study of the five Indian steel towns namely Jamshedpur, Durgapur, Bhilai, Rourkela and Bokaro covering the period 1961-1991 (Basak, 2000) also examined the nature, direction and degree of interaction of the steel towns with the surrounding region.

Likewise, the study of mining and urbanization in the Raniganj coal belt by Lahiri-Dutt (2001) analysed how in the post independence years, the huge amounts of public capital investment in natural resource extraction and industries generated urban growth and a complete transformation of the physical and cultural landscape over a short period of time. In her research from the view point of an urban geographer, she studied the growth of mining towns of Raniganj coal belt and analysed the implicit linkages between coal mining and urbanization in the Raniganj coal belt. However, the issue of how the multiple kinds of economic activities resulting in the spatial expansion of Asansol where the coal mines

served as the germ cell was not within the ambit of her research area.

There are some cross-sectional studies where Asansol region figures. They concentrated on some specific issues. For instance, the study on the ancillary industries in Asansol-Durgapur region (MacDougall, 1965) was an in-depth one. The account of these industries provided us necessary information about the pattern of industrialisation here during the 60's.

There have been some considerable research works by urban geographers concentrating on the spatial aspect of the urbanisation process of Asansol-Durgapur region like the evolution of Asansol-Durgapur industrial complex (Chakraborti, 1998), spatio-temporal growth of industrial centres and its impact on urbanization in Asansol-Durgapur area (Guha, 1996) and the impact of environmental problem on land use of Ajoy Damodar inter-fluve (Dutta, 2003). They focussed mainly on the regional aspects. Asansol Planning Organisation and Asansol Durgapur Development Authority published some socio-economic reports. A considerable volume of studies on this region focussing mainly on the industrialisation aspect thus demonstrate the economic importance of Asansol city, the nerve centre of the Asansol-Raniganj-Durgapur region as a subject of case study.

However, a comprehensive study of a city incorporating both space and time has remained an unexplored area to the best of our knowledge. To fill in this gap, the present study concentrates on how the spatial and economic changes shaped the settlement pattern in Asansol during 1951-2001. It is an intensive study of the wards of Asansol Municipal Corporation followed by statistical analysis.

Moreover, it is relevant and significant for accessing the industrial-urban development of West Bengal as in the post-independence period West Bengal experienced rapid urbanisation in its Asansol-Raniganj-Durgapur mining based industrial region. We have chosen 1951- 2001 as our datum line for this reason.

Before analysing the intra-city location pattern, it is necessary to have a picture of the region in which Asansol is situated. The western part of Barddhaman district, the mining based Asansol industrial region is an integration of a number of cities and small towns starting from Durgapur in the east and stretching westward to Raniganj, Asansol, Burnpur, Kulti, Neamatpur, Rupnarayanpur and Chittaranjan of which Asansol is the nucleus. Among the notable ones, there are two Class 1 cities Asansol and Durgapur governed by Municipal Corporations. Asansol is the hub of trade and commerce. Raniganj is the storehouse of coal, and Jamuria has also many coal mines. It is also becoming an industrial hub. The urban areas created in the colonial period are Asansol, Burnpur, Raniganj and Kulti. The towns created for fulfilling the needs of heavy industrialization objectives of the Indian Government in some backward areas of Asansol region are Chittaranjan, Durgapur (1961), Jamuria (1961) and Hindusthan Cables Town-

Rupnarayanpur (1971). A major industrial- urban cluster grew up around the city of Asansol since it is a provider of rail junction and road network, coal and steel and a trade and commerce hub. The city Asansol has an urban area of 127.87 sq km. The population of Asansol is 475,439. Population density is 3718 per sq km. (Barddhaman District Census Handbook, 2001). The urban local body of the city, the Asansol Municipal Corporation of today was formed in 1994 by amalgamating Asansol municipality, Asansol blocks and the Burnpur Notified Area.

A large number of coal mines of Eastern Coalfields of India are in and around Asansol. Collieries are mainly located in the eastern part. Asansol is an important division of the Eastern Railways. It is along the axial routes connecting the metropolis like Kolkata and Delhi. The grand chord line (Raniganj to Dhanbad) and main line (Sitarampur to Chittaranjan) of the eastern railway bifurcates at Sitarampur junction, a little to the west of Asansol. In addition, the branch of the south eastern railway connects the city with other parts of the country through Adra and then to Jamshedpur via Purulia and Kharagpur via Bankura. A branch line connects Andal with Sainthia via Sahebganj loop. A large number of super fast express trains, passenger trains and goods trains pass through Asansol daily. The Map 1.1 below shows some of these spatial links.

Map 1.1

## TRANSPORTATION LINK OF ASANSOL WITH NEIGHBOURING REGIONS



LEGEND

| | | | |
|---|---|---|---|
| Proposed Satellite Township Mangalpur | Jamuria Municipality (JM) Area 82.00 sq. km. | Metalled Road | |
| Raniganj Municipality (RM) Area 25.00 sq. km. | Kulti Municipality (KM) Area 99.00 sq. km. | Unmetalled Road | |
| | | Railway | |
| | | Railway | |
| Asansol Municipal Corporation (AMC) Area 129.20 sq. km. | Durgapur Municipal Corporation (DMC) Area 154.20 sq. km. | PS Boundary | |

SCALE : 1" = 4 Mile

Source : Asansol - Durgapur Development Authority

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The spatial advantage of Asansol is not restricted to rail transport only. Asansol has an excellent strategic location as it is situated in the border region of Bengal and Jharkhand. Grand Trunk road (NH-2) is positioned in the east-west direction parallel to the eastern rail line. It is the main arterial road of this region. NH-Bypass has been constructed in the northern periphery of Asansol Urban Area. Most of the urban settlements are located along this transport corridor. The city being the centre of trade and commerce is well linked with other regions. It is also a market for steel since there are railway engine, pipe and wagon making factories here. There is high centralization of multiple activities of retail and whole sale trade on GT Road.

The secondary and tertiary sectors, the development of built infrastructures like good mass transit system, construction of basic and heavy industries like Kulti Iron Works, Burnpur Iron and Steel Factory, ancillary sectors, wholesale as well as retail trade and commerce contributed to a large extent in the city's development.

The type of built infrastructure is a signifier of the economic activities of the city. The industries occupy 2750.36 acres of land of this city (An Introspection, Asansol Municipal Corporation, 2001). They are mainly concentrated in the north western part. The largest employers in this city are the two public sector units, namely Eastern Coalfields Limited and IISCO Steel Plant of Steel Authority of India Ltd. Other major industries are both public and private sector units of various size and age producing a variety of products like sponge iron, industrial gas, refractory items etc.

The land use pattern of a city is a proof of the inter-linkage between space and economy. Each and every city has unique land use pattern which specifies how the space has been created by the economy.

Mining occupies 675 acres of surface land in the city. Damra, Ajay Second, Khusdanga, Girmint, Kakardanga, C M Ghusik, Ghusik no 3, Mohisila Hattola, Narsamudra, Ghusik, and K.D.Sim are the collieries within the corporation area. Railways occupy 1630 acres of the total land of the city. Industries occupy 2750.36 acres. Industries are mainly concentrated in the north western part. Agriculture occupies 7943.52 acres. Crops are harvested mainly during the rainy season. For other urban functionaries' 10256.12 acres are reserved. Total vacant land is 82.45 acres. (An Introspection, Asansol Municipal Corporation, 2001). There is lack of adequate information regarding the underground land use of this mining based industrial city. The pie chart-figure 1.1 below shows the percentages of the surface land utilisation pattern of this city.

## Fig 1.1

### Surface Land Utilization Pattern in Asansol City



Legend:
- Mining
- Railways
- Industries
- Agriculture
- Other Urban Functionaries
- Vacant Land

Values shown: 2%, 5%, 9%, 25%, 26%, 33%
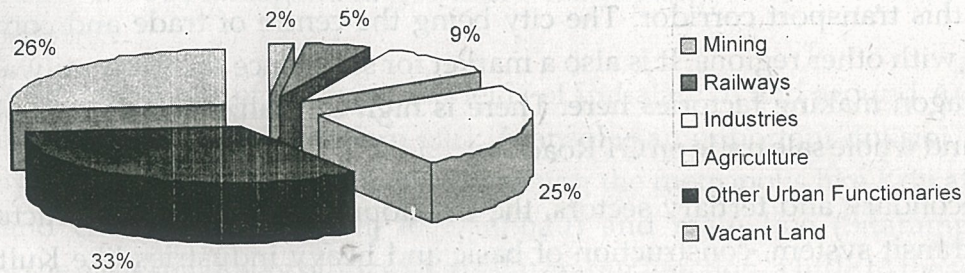
Source: An Introspection (2001), Asansol Municipal Corporation, Asansol

In Asansol region, the space transforms from wilderness to a busy mining based industrial urban agglomeration due to flow of capital and subsequent construction of built infrastructure, flow of people, setting up of linkage industries, creation and expansion of inter and intra regional linkage.

Colonialism played a major role in this regard. Though coal was discovered in Raniganj as early as in 1774, colonial policy restricted the mass extraction process for nearly a half century. The formation and expansion of economy of Raniganj was related to the motive of the British capital owners and the managing agencies. Moreover, the construction of railway in India helped in the expansion of coal sector. The expansion of railway here was mainly due to the security reason. The First War of Independence disturbed the economic drainage process. It brought both a change in administration where the administrative power transferred from East India Company to British Emperor. Consequently, the nature of capital flow also changed. Therefore, the nature of development of that space was the outcome of the interest of those foreign capital owners. They initiated the urbanisation in this mining belt for extraction of the surplus generated from their initiatives.

Moreover, the native princely rulers and the big zamindar class with huge possession of land also took part in the production process. Similarly, people from different states came here both as provider of capital and labour. Accordingly, this region generated localisation and urbanisation economies. The urban hierarchical structure with formation of towns like Raniganj, Asansol, Kulti and Burnpur in this mining region in the colonial period was the outcome of these agglomeration economies. They acted as a backdrop for the creation of an industrial- urban region which in the later period became famous as the Ruhr of India.

**The Data Base**

The study is based mainly on secondary data substantiated by primary data as per requirement.

The Secondary data sources consist of:

1-i)  Primary Census Abstract of Barddhaman district of different years

1-ii)  Reports of Asansol Durgapur Development Authority

1-iii)  Reports of Asansol Municipal Corporation

1-iv)  Reports of Central Pollution Control Board, Web edition

1-v)  Relevant literature and research papers on mining and urbanization

1-vi)  Industrial statistics (especially small industries sector) from the Sub District Industries Centre, Durgapur

1-vii)  Website of Coal India Limited

1-viii)  Other web resources.

The primary data consists of

2-ii)  Unpublished information materials gathered from the offices of the Asansol Municipal Corporation; coal mines of Eastern Coalfields Limited; Asansol Sub Divisional Mini Bus Union; Eastern Railways and West Bengal Industrial Development Corporation.

2-iii)  Oral history of the region and the present scenario collected from local people.

The study is divided into six sections besides this introductory one. The second section describes in brief the existing urban location theories for analysing the intra city spatial dynamics. They function here as the framework of our study. The next three sections 3, 4 and 5 analyse the spatial and economic changes during the three significant time periods. Some emergent features cropped up during these different periods. Accordingly a conceptual outline is developed in the section 6 based on 1991-2001 data followed by its statistical analysis. Section 7 contains concluding remarks.

## 2. Urban Location Theories — A Framework for Intra City Spatial Dynamics

The land use pattern in a city can be explained by economic location theories which emphasize primarily on the competition for scarce land. The urban location theories explain the process of transformation from a mono-centric to a multi-centric urban spatial structure. They focus on the different nature of agglomeration economies leading to the separate spatial concentration of firms and households in a city.

Cities can be mono-centric or multi-centric according to the urban spatial structure. It is based on the concept of land use and the rent. Mono-centric city model assumes a spatial

economic structure where all economic activities take place only at the central location. The central point is called the Central Business District (CBD) which has maximum connectivity with the other parts of the city. Land is homogenous. Transport cost is least at the centre and rises as distance from city centre increases. Space is used more intensively at the centre and near it and the density of use declines with increasing distance. So rent increases as one move near the city centre. The bid rent function is downward sloping.

As rent is highest at the CBD, the land goes to those who gains maximum from being located at the CBD and who can afford to pay that high rent. The user of the land there are mainly non residential business firms and the administrative sectors. Households can demand there only a smaller space as price of the land is very high. Among the firms, office firms or the service sectors demand the most central space as they gain most from being in the centre. These sectors require face- to- face personal meetings, trained labour and white-collar executives, quick information network, access to specialised business services like printing, lawyer, accountant, designer shopping and recreational activities. So the CBD is the chosen space for the different corporate headquarters, administrative headquarters, banking and finance institutions, brokers, insurance companies and management consultancies.

In the mono-centric framework, households are attracted toward centre to curtail their commuting cost. As all economic activities are located here, they have to come here for their living. As rent is highest in the centre, the housing price function resembles a negative sloped price curve which reduces as distance from the CBD increases. So overall use of central slots by households are smaller than the business units as the high rent structure made the land use more suitable for business classes than residential ones. The central land use pattern reveals that city centre is the dwelling place of two classes. One is the business class and the other is the poor household class attached strongly with these business activities by formal and informal jobs but cannot afford a high commuting cost. So they get struck with minimum housing space there. Higher income group can stay at a comparatively greater distance as they prefer more housing space and thus can afford a higher commuting cost. They have wider choices as they can stay near the CBD in the high rises which is an indication of vertical space use in an economy. So the land can be used by more people for different uses.

The spatial structure of a mono centric city are explained by the concentric-zone theory (Burgess, 1925), the axial-central theory (Hurd, 1924) and the wedge or radial sector theory (Hoyt, 1939). They integrated the role of different disciplines like economics, urban ecology, geography and sociology in the evolution of a mono centric city structure. The concentric zone theory states that the process of urban growth occurs through a series of concentric circles expanding radially from the central business district (Figure 2.1). There

are five broad zones: 1) central business district; 2) transitional zone; 3) low income housing; 4) high income housing zone; and 5) commuter zone.
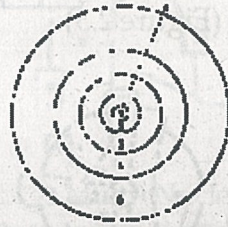


Fig 2.1 Concentric-Zone Model
Source: Harvey, Jack (2000). *Urban Land Economics*, New York, Palgrave

The axial-central theory, along a transportation axis based on accessibility advantages offered by sites on this axis or in a central mode around a point of attraction based upon proximity was introduced by Hurd (1924). The urban growth is the combination of these two growth patterns. The city grows fast along the main transportation axes (rail and road) radiating from the centre of the city, with the parts between being filled up afterwards (Figure 2.2).
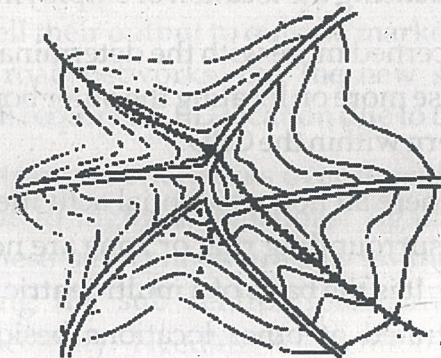


Fig 2.2 Axial Model
Source: Harvey, Jack (2000). Urban Land Economics, New York, Palgrave

The wedge or radial sector theory is a combination of the concentric-zone theory and the axial theory by allowing the spatial expansion in a more irregular mode. It focuses primarily on the location pattern of the households and incorporates the socio–economic factors in residential location choice. It suggests that as the city grows, diverse socio-economic groups tend to segregate. Over time, high quality housing tends to expand outwards from the centre along the fastest travel route (Harvey, 2000) whereas low income households are located on the opposite side of the CBD near the industrial land use. So instead of concentric zone there are sectors. Household sectors radiate outwards from the

city centre separating the manufacturing into other sectors. Sector 1 is the central business area; sector 2 is the wholesale and light manufacturing area, sector 3 is foe low income housing groups, sector 4 is for middle income housing groups and sector 5 is the residential site for high income groups (Figure 2.3).



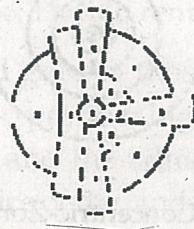Fig 2.3 Radial Sector Model

Source: Harvey, Jack (2000). Urban Land Economics, New York, Palgrave

The household land use pattern in the city depends not only on transport cost but also on similar income, taste pattern and culture. People can pay a higher rent for high income housing in sector 5 to live with residents of similar outlook and in a good environment. It is an example of the social agglomeration economies which will be analysed later. This theory gives attention to the factors influencing household location decision in an urban area but neglects the factors influencing the location of employment opportunities.

However these theories are concerned more with the determination of residential location choice. Moreover, they emphasise more on locating the outer boundary than to find out the space economy interaction pattern within the CBD.

These assumptions of zoning where all non residential activities are concentrated only in the CBD and all housing in the surrounding ring or zone are not a consistent one when a city spatially expands over time. It is the basis of a multi centric city where non residential activities are spatially concentrated at other locations besides the CBD. The spatial arrangement in a multi-centric city is explained by the multiple-nuclei model. The multiple-nuclei theory (Harris and Ullman, 1959) states that urban growth is manifested in multiple clusters or nuclei of complementary uses. Thus a number of nuclei exist in large cities (Figure 2.4). These nuclei are the centres of activities other than the prime centre at the CBD. Nucleus 1 is the CBD. Nucleus 2 is the site for wholesale and light manufacturing followed by low income housing in nucleus 3. Nucleus 4 and 5 are the sites for middle and high income residential groups. Nucleus 6 is the site for heavy manufacturing; nucleus 7 is the outlying business area followed by residential suburb in nucleus 8 and industrial suburb in nucleus 9.
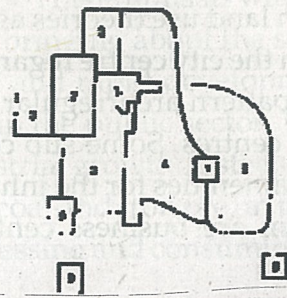
Fig 2.4 A Multi- Nuclei Model
Source: Harvey, Jack (2000). Urban Land Economics, New York, Palgrave

There are a number of reasons for the emergence of these sub centres. These centres act as focal points for generating agglomeration economies. Secondly, the high rents in the CBD compel the firms to establish or shift their production centre in the peripheral areas. Moreover after a certain time, CBD cannot accommodate new employment due to shortage of physical space. Other areas of the city will be more attractive than the city centre for employment generating activities. The agglomeration economies of the CBD will weaken ultimately due to exhaustion of increasing returns to scale. Again, a large number of manufacturing industries do not prefer a CBD location. They require large site. The large plant size can internalise the externalities. So they avoid the exorbitant rent and heavy traffic congestion costs in the centre by choosing other peripheral locations. Moreover the firms who sell their output to outside market prefer peripheral locations for easier transportation via road networks. But the new small firms who are unable to internalise externalities still require a CBD location due to the advantages of the CBD.

The development of road transport networks over time thus encourage firms producing basic goods to locate close to highway junctions. Again the reasons for the offices to establish themselves in these sub centres are due to the decoupling of their different operations and thus using the sub centres for many back office activities, better communication and connectivity. Needless to mention the spatial attributes of zones results in the formation of the sub centres and their distinctive land use patterns. Similarly from the viewpoint of the household, rising income, lower commuting costs due to better roads, a better socio cultural environment, induce people to concentrate in some particular locations.

So the growth of these nuclei or sub centres is related to the 'range of a good and service' and on the 'spatial threshold'. When a city grows, it gradually diversifies various activities. The major centre at the CBD and the sub centres thus perform different functions. For specialised higher order services, citizens are ready to commute to the CBD. For other lower order services, they avail the nearest sub centre. Hence to the citizens, the CBD and the sub centres are both valuable.

A multi-centric city theory is thus a more flexible approach than the mono centricity

approach. The mono centric urban land use theories assume that population densities are identical at the same distance from the city centre regardless of the direction. But in a multi centric city, the rent and density pattern are irregular ones depending on the distinctive types of land use in the multiple centres. Some sub centres which provide services like good educational, health or other amenities for the inhabitants may have high population densities and since many of them are business centres, they can reflect a residential population density crater.

However, we analysed the formation and evolution of a multi-centric city from the standpoint of mainly business activities, but the arrangement of urban sub areas is beyond the scope of just physical, economic and administrative phenomena. The spatial concentration of people in the different areas is guided also by the criterion of social agglomeration economies. Especially social stratifications besides economic stratification are closely associated with the urban multi centric spatial structure. There are also other operating forces like historical influences, topographical characteristics, cultural and political factor and size of the urban area and the role of institutions. The discussion thus gives an idea that no single theoretical framework can analyse the dynamic urbanisation process of a city which changes over time and space. Each urban area includes different operating forces or special features. The spatial and economic interaction mechanism is not identical in all urban areas. The study has to be formulated accordingly considering the unique spatial characteristics besides the other factors.

Urban location theories assume that the competition for scarce land in any urban area is the main factor that influences the location pattern in a city. Thus the accurate information regarding the urban land use pattern seems to be an important component. However, the problem here is due the shortage of authentic and exhaustive statistical record regarding the rent pattern and the functional use of land. To override that problem, residential population density is chosen as a proxy variable for intensity of land use. No doubt, the decision of the residents regarding their location to carry on their objectives reflects the nature of demand for the land in a city.

In view of that, we are studying the structural changes in the city mainly by considering the socio- economic characteristics of the residential population in the different wards of the city during the above mentioned three periods. Wards are the smallest politico-administrative units in a city and there are accessible census reports regarding their areas as well as economic and social characteristics which are useful for our analysis.

## 3. Spatial and Economic Changes in Asansol City during 1951-1971

Asansol region experienced significant spatial and economic changes due to major shifts in the national economic policy. Asansol, being its nerve centre naturally felt the impact.

The Indian economy was embedded to the Mahalanobis Planning strategy during the period from mid fifties to the mid sixties which stressed the long term benefit of investing

in basic and capital goods industries. This emphasis was reiterated in the Industrial Policy Resolution of 1956. With a view to bringing about the socialistic pattern of society, it was decreed that the need for planned and rapid development require that all industries of basic and strategic importance be in the public sector. The implementation of this policy required strategy of balanced industrial growth. If steel capacity was to be increased, there had to be a matching expansion in coal and iron ore, in the capacity of railway to and from the steel factories and the steel processing and consuming industries.

The industries of this region were mainly the basic and capital goods producing ones. Therefore, the aforesaid Industrial Policies played significant role in the industrial-urban growth in the city as well as in the region.

Asansol was a mono-centric town in 1951. The introductory section narrated how the town evolved rapidly in the late nineteenth century because of rail transport. Since rail was the earliest high-speed mode of public transport there, all the main transport routes converged to the railway station and so the central business district was also located in its neighbourhood. Thus people gathered around the then city centre, which comprised of the railway station in the north of the Grand Trunk Road and the market in the south of the this road. Except that, absence of suitable routes connecting the other areas initially made land at the central locations adjacent to the rail station and along the Grand Trunk Road the most valuable. Such locations offered the advantage of low transport cost, greater accessibility to the input market, and a greater range of economies of scale. As the Grand Trunk road is also parallel to the rail route, the residential population densities were higher adjacent to the road. The municipality then consisted of seven wards. Asansol however was promoted from the status of a class II town to a city in 1961. It still consisted of seven wards. And its area was the same as in 1951; but the population density of the wards escalated. The Table 3.1 depicts the rise in population growth in the different wards.

Table 3.1

Ward Level Decadal Rate of Growth of Population in Asansol, 1951-1961

| Ward Number | Decadal Rate of Growth of Population (%) |
| --- | --- |
| 1 | 51.29 |
| 2 | 240.07 |
| 3 | 116.54 |
| 4 | 190.52 |
| 5 | 169.84 |
| 6 | 146.94 |
| 7 | 33.49 |

Source: Computed from the data of Census of India, District Census Handbook for Barddhaman 1951 and 1961.

Among the wards as mentioned by the above Table 3.1, ward no 2 recorded the highest growth rate. It was alongside the G.T. Road and had an excellent location being the gateway to the Burnpur Road and the IISCO factory and also the entry point of the way to Kulti Iron Works and the Chittaranjan Locomotive Works. The administrative centre of the city — the court, treasury, and the police station were also in the neighbouring ward number 1 and 3. The built spaces for non basic activities like good schools were located in the nearby areas thus making the locality an attractive space for residential location even for the people who were employees in the industries of the neighbouring industrial-urban centres like Burnpur, Kulti and Chittaranjan. People preferred to reside in wards like 2, 4 and 5. The growth rate of ward no 1 and 3 were comparatively low as there were some areas which were not available for private use since they were under government jurisdiction. Ward number 5 also had land under rail authority's control. Budha village, one of the oldest localities of Asansol was in Ward number 6. There were also large size of lands owned by Christian missionaries in wards 6 and 7. The comparatively lower population growth in these wards was due to non availability of land during this period for new settlement. Moreover, Ward number 7 was near the market area and the lowest growth rate suggests that the land was allotted for non residential business purposes.

During 1961-1971, the decadal growth rate here was an impressive 50.83%. The rapid rise of residents in the city changed the structural composition of the wards. The existing wards were rapidly restructured and the number of wards increased from 7 to 25.

Table 3.2
Area & Number of Wards, Asansol Municipality, 1951-1971

| Year | Area (in sq km) | Number of Wards |
|------|-----------------|-----------------|
| 1951 | 10.44 | 7 |
| 1961 | 10.44 | 7 |
| 1971 | 10.44 | 25 |

Source: Census of India, District Census Handbook for Barddhaman 1951, 1961 and 1971.

This restructuring of Asansol was due to population hike in the city since 1961. Consequently the population of the first 7 wards of the reorganised Asansol Municipality had a steep fall as the following Table 3.3 shows. It depicts decadal growth rate of population in the erstwhile seven wards of 1961.

---

[1] A ward is a constituency for Municipal elections. Whenever the population of a constituency crosses the upper ceiling of its population the ward is delimited yielding place to new wards. In short this is how wards multiply in a municipality whose area might remain constant.

Table 3.3

Ward Level Decadal Rate of Growth of Population in Asansol, 1961-1971

| Ward Number | Decadal Rate of Growth of Population (%) |
|---|---|
| 1 | – 54.01 |
| 2 | – 73.71 |
| 3 | – 60.70 |
| 4 | – 75.29 |
| 5 | – 86.42 |
| 6 | – 39.85 |
| 7 | – 69.10 |

Source: Computed from the data of Census of India, District Census Handbook for Barddhaman 1961 and 1971

The urbanisation of Asansol within the compass of its municipality was in fact vigorous and expansive. This can be best proved by its spill over effect on the neighbourhood of the municipality. The following maps 3.1 and 3.2 show how urbanisation was rapidly expanding itself with Asansol municipality as its nucleus.

# Map 3.1
## Urban Area in Asansol, 1961
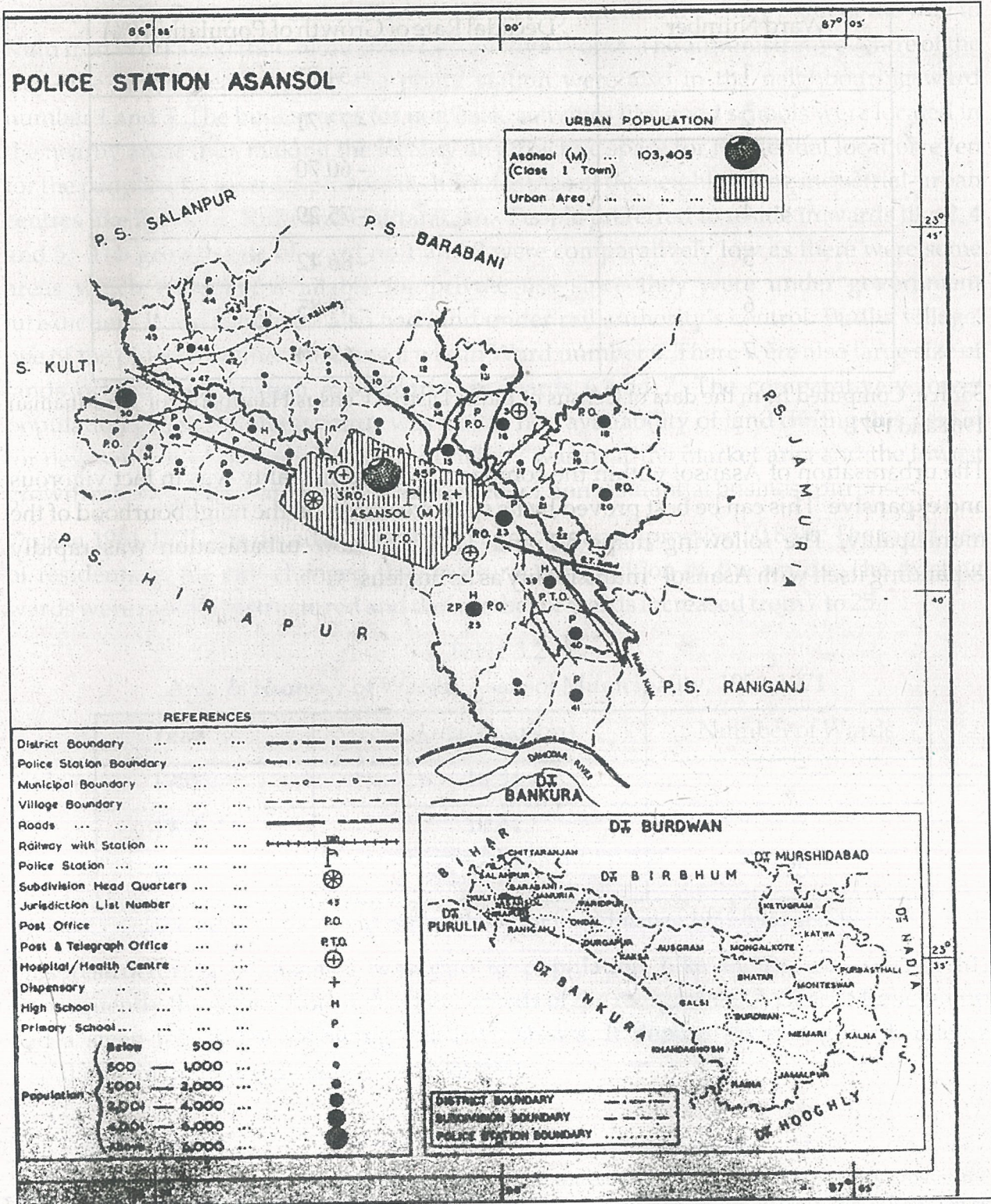


Source: Census of India, District Census Handbook for Barddhaman 1961

# Map 3.2
## Urban Area in Asansol, 1971

**POLICE STATION ASANSOL**

BIHAR    DT BURDWAN

DT BIRBHUM    DT MURSHIDABAD

DT PURULIA    DT BANKURA    DT NADIA

DT HOOGHLY

FURLONGS   2 MILES

| | |
|---|---|
| STATE BOUNDARY | — · · — |
| DISTRICT DO | — · — |
| SUBDIVISION DO | — — — |
| POLICE STATION BOUNDARY | — — — |

P.S. SALANPUR    P.S. BARABANI

P.S. KULTI

SARAKDI-NADIHA (N.M.T.P)

NH

P.S. HIRAPUR

ASANSOL (M)

P.S. JAMURIA

P.S. RANIGANJ

DAMODAR RIVER

DT BANKURA

N.B. NEW J.L. NUMBERS ARE GIVEN

**INDEX**

| | |
|---|---|
| District Boundary | — · — |
| Police Station Boundary | — — — |
| Municipal Boundary | — o — o — |
| Non-Municipal Boundary | — + — + — |
| Village Boundary | — — — |
| Police Station Headquarter | © |
| Jurisdiction List No. | 12 |
| Railways (Broad Gauge) | RS |
| National Highways | NH |
| Roads (Metalled/Unmetalled) | |
| Rivers | |
| Post & Telegraph Offices | P.T.O. |
| Post Offices | P.O. |
| Hospitals/Primary, Subsidiary Health Centres/Dispensaries | ⊕ |
| Maternity, Child Welfare And Family Planning Centres | ▼ |
| Schools — High | H |
| Schools — Primary/Middle | P |

| Population | |
|---|---|
| Below 200 | · |
| 200 — 499 | |
| 500 — 999 | |
| 1,000 — 1,999 | |
| 2,000 — 4,999 | |
| 5,000 & Above | |

**URBAN POPULATION**

| | |
|---|---|
| ASANSOL (M) | 155,968 |
| (CLASS I TOWN) | |
| SARAKDI — NADIHA (N.M.) | 5,786 |
| (Sen Raleigh Township) | |
| (CLASS V TOWN) | |
| URBAN AREA | |

Source: Census of India, District Census Handbook for Barddhaman 1971

The shaded parts show the total urban area. The spatio- economic changes also led to the rise in urban growth during the next decade. Our next section analyses the emergent factors behind the urbanisation process in this period.

## 4. Spatial and Economic Changes in Asansol City during 1971-1991

The seventies was the era of nationalisation of industries. Coal industry was nationalised during 1971-1973. The city turned bigger during these twenty years as shown by Table 4.1.

Table 4.1

Area & Number of Wards, Asansol Municipality, 1971-1991

| Year | Area (in sq km) | Number of Wards |
|------|-----------------|-----------------|
| 1971 | 10.44 | 25 |
| 1981 | 20.02 | 25 |
| 1991 | 25.02 | 30 |

Source: Census of India, District Census Handbook for Barddhaman 1971, 1981 and 1991.

The area of the city increased significantly during the first decade of this study period. The wards became bigger in size. In the next decade, the number of wards also increased to thirty from twenty five with expansion of the area. The city was transforming from mono centric to multi centric one due to emergent features which came up during this period.

The seventies was the era of nationalisation of public sector industries like coal, steel and some other manufacturing units. Nationalisation of these industries gave a fillip to the overall development in the employment and urbanisation in this region. The rate of urbanisation here was 17.57% in the first decade and a significant 42.98% in the next decade.

As mining and manufacturing industries played a dominant role for urbanisation, we are comparing the proportion of population engaged in mining and non household industries in the 25 wards of 1971 with those wards in 1991 . The following Table 4.2 depicts the location pattern of the residents engaged in the mining sector in 1971 and 1991.

---

[2] It is convenient to study the changes in occupational structure considering the 1971 and 1991 Census as both of them were depicted similarly in nine fold classifications. Among the 30 wards in 1991, the first 25 wards were the comparable ones. It is not possible to compare these changes in the other decades due to unavailability of data in the same format.

Table 4.2
Proportion of People in Mining Occupation (%), 1971 and 1991

| Ward Number | Male '71 | Male '91 | Female '71 | Female '91 |
|---|---|---|---|---|
| 1 | 5.49 | 12.43 | 4.41 | 3.85 |
| 2 | 2.49 | 6.04 | 1.72 | 2.60 |
| 3 | 1.91 | 4.86 | 0.00 | 0.47 |
| 4 | 1.53 | 1.54 | 2.50 | 0.00 |
| 5 | 2.11 | 3.37 | 3.77 | 4.58 |
| 6 | 1.29 | 5.52 | 2.00 | 2.61 |
| 7 | 2.03 | 2.95 | 2.08 | 2.92 |
| 8 | 0.10 | 1.40 | 0.00 | 0.48 |
| 9 | 0.27 | 4.01 | 3.45 | 3.39 |
| 10 | 0.46 | 2.71 | 0.00 | 1.27 |
| 11 | 0.96 | 0.74 | 0.00 | 0.00 |
| 12 | 0.92 | 0.51 | 0.00 | 0.00 |
| 13 | 0.92 | 0.39 | 0.00 | 0.00 |
| 14 | 2.76 | 1.94 | 0.00 | 1.89 |
| 15 | 2.33 | 1.84 | 4.00 | 0.00 |
| 16 | 3.17 | 3.32 | 1.72 | 1.15 |
| 17 | 27.33 | 1.71 | 41.38 | 1.18 |
| 18 | 0.79 | 2.10 | 0.00 | 0.00 |
| 19 | 2.33 | 3.18 | 0.00 | 1.32 |
| 20 | 0.63 | 14.65 | 0.00 | 9.06 |
| 21 | 1.00 | 3.43 | 0.00 | 2.70 |
| 22 | 0.46 | 0.79 | 0.00 | 0.43 |
| 23 | 0.80 | 0.89 | 0.00 | 3.48 |
| 24 | 0.15 | 3.61 | 0.00 | 2.22 |
| 25 | 0.44 | 1.97 | 3.45 | 2.56 |
| Asansol MC | 2.51 | 3.44 | 2.82 | 1.93 |

Source: Computed from the data of Census of India, District Census Handbook for Barddhaman 1971 and 1991.

The Table 4.2 shows that during 1971-1991, more male population engaged in the mining activities started to reside in the city but the residential female population engaged in the mining sector diminished. The policy decision of the government adversely affected the female mining employment scenario.

The settlement pattern became more even in 1991 than in 1971. Excepting a single ward, ward number 13, every other ward contained male population engaged in mining occupation. The concentration of female workers in some wards also reduced during this period. Ward number 13 was the CBD area. The mining based working population naturally lived in the wards where there were service quarters for them or else they thronged in the wards where there was built in infrastructure for residence with schools and other likely amenities were near at hand. They were well connected by transport network and were either beside G.T. Road or its parallel S.B Gorai Road.

The above table shows that there were significant changes in the proportion of mining population in the wards 17 and 20. Whereas the first one revealed a notable reduction, the second one demonstrated a considerable increase. Ward 17 was adjacent to the Central Business district and the other wards in the CBD like the ward numbers 13, 14, 15 and 16 also exhibited that either the population of the mining population remained constant or else waned. These wards thus have been transformed from residential to non residential urban space with scarcity of land for residential purposes. Moreover, the mining population here in the sixties i.e. in the pre nationalisation period were mainly semi skilled migrants from the neighbour states. They stayed together in a location. Ward 17 was one of those wards which give an idea about this social and cultural agglomeration. However, from the eighties onwards, in the post nationalisation era, ECL suffered a setback which virtually reduced the in migration of semi skilled labours employed in coal industry here from other states (CDP, 2006). The mechanisation of production led to decrease of manual labour as revealed by the decrease of residents engaged in mining activities in some wards. In-migration decreased here (Socio Economic Report of ADPA, 1999-2000). Thus depopulation occurred. However, the built up area could not remain as an empty space. Thus gradually these wards were turned to non residential ones. The changes in the occupational structure as studied from these wards are evidences of that. Ward 20 was one of the peripheral wards at that time. Land was comparatively cheaper there than in the central locations. It was alongside the G.T. Road. A significant number of people employed in the mining activities were the residents of the Mohisila colony here[3]. The location of a degree college and two higher secondary schools nearby also enhanced the preference of this ward for residential purpose. Moreover, there were coal mines in the neighbouring areas and the adjacent town Jamuria was developing as a manufacturing centre. Thus people associated with the activities there also chose to reside here due to availability of urban amenities. The few wards which experienced a rise in female population engaged in mining activities were those where proportions of male mining population were also comparatively high. Thus it indicated the existence of social agglomeration of some sort in those areas.

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[3] The refugees of East Pakistan were systematically settled in Mohisila Colony during the fifties. The State Government granted ninety years' lease of land to the settlers. The colony was a vast one incorporating ward number 18, 19 and 20. The refugees supplied a fresh army of labourers and white collar jobs.

The following Table 4.3 depicts the location pattern of the residents engaged in the non household industries in 1971 and 1991.

Table 4.3

Proportion of People in Non-Household Industries in Asansol Municipality (%), 1971 & 1991

| Ward Number | Male '71 | Male '91 | Female '71 | Female '91 |
|---|---|---|---|---|
| 1 | 44.09 | 32.50 | 7.35 | 8.85 |
| 2 | 19.17 | 23.51 | 13.79 | 4.33 |
| 3 | 54.64 | 30.08 | 36.36 | 7.55 |
| 4 | 24.29 | 57.01 | 1.25 | 9.20 |
| 5 | 11.40 | 22.75 | 0.00 | 6.11 |
| 6 | 28.98 | 34.03 | 8.00 | 4.58 |
| 7 | 26.97 | 27.72 | 2.08 | 7.30 |
| 8 | 21.43 | 24.05 | 8.33 | 1.90 |
| 9 | 11.47 | 25.62 | 10.34 | 5.08 |
| 10 | 15.22 | 22.87 | 3.13 | 5.06 |
| 11 | 17.94 | 23.76 | 12.12 | 4.88 |
| 12 | 16.70 | 13.23 | 2.7 | 0.00 |
| 13 | 20.37 | 7.11 | 1.3 | 2.33 |
| 14 | 37.69 | 20.92 | 0.00 | 6.60 |
| 15 | 21.72 | 13.04 | 7.00 | 4.92 |
| 16 | 28.64 | 12.87 | 5.17 | 1.15 |
| 17 | 24.70 | 28.69 | 6.90 | 4.71 |
| 18 | 6.96 | 16.90 | 3.30 | 2.01 |
| 19 | 18.05 | 28.25 | 0.00 | 2.65 |
| 20 | 15.82 | 25.26 | 0.00 | 4.72 |
| 21 | 25.24 | 21.86 | 11.11 | 0.00 |
| 22 | 9.77 | 7.14 | 5.00 | 1.30 |
| 23 | 19.80 | 8.94 | 8.33 | 0.87 |
| 24 | 23.18 | 13.01 | 0.00 | 7.41 |
| 25 | 25.46 | 15.92 | 0.00 | 7.69 |
| Asansol MC | 22.79 | 22.28 | 6.15 | 4.45 |

Source: Computed from the data of Census of India, District Census Handbook for Barddhaman 1971 and 1991.

The Table 4.3 shows that though the proportion of residential population engaged in the non household industries reduced during this period. We have studied in the last chapter that since the '80's, deceleration set in the large manufacturing and mining sectors. The recession in production affected both the public sector and the large private sector industrialisation jointly. Some large private sector manufacturing units became sick due to

losing in market competition, the public sector suffered as they were compelled to nationalise some of these sick units. It was quite normal that the proportion of population who resided in some wards and employed in non household industries reduced. However, some wards reflected an opposite trend. Proportion of people engaged in these industries increased in some of them. Male workers increased significantly in the wards like 8, 9, 11 and 17. Similarly, female workers increased significantly in the wards like 13, 14, 24 and 25. We have studied in chapter 4; there appeared a trend towards the proliferation of small scale manufacturing units in the city during this period. They were concentrated in some wards to gain the benefit of external economies of some sort. For instance, productions of mining and machinery equipments were concentrated in wards like 17, 20, 21, 24 and 25[4]. These wards experienced either rise in male or female employment or rise in both male and female employment. Wards like 24 and 25 had also small scale units producing exquisite garments and home décor to cater the high end market. Similarly factories producing electrical equipments were concentrated in the wards like 18, 19 and 20 especially in ward number 20. Among them, ward numbers 19 and 20 show significant rise of both male and female population employed in non household industries. These were all parts of already developed Mohisila colony. We have mentioned earlier that these wards were also suitable for residential location due to availability of non basic activities in the neighbourhood. There were also automobile repairing units in ward number 20.

Thus it shows that besides the city was turning multi centric with a number of sub centres having diverse economic activities.

Similarly, in the south western part of the city, ward number 4 and 5 attracted a considerable number of residential population engaged in the non household industries. There was more than one reason for this kind of urbanisation. For instance, land was available here during this period as the missionary schools which owned large tracts of land sold parts of them. The residential area Hill View developed in this way here. Transport network started to develop through S. B Gorai Road. Ward number 1 and 3 beside S. B Gorai Road as mentioned earlier had land congenial for new urban growth as it already contained built space Court, Thana, Treasury Stadium, schools and college. Moreover, there were factories producing electrical equipments in ward number 1, 3 and 4. There was also automobile repairing unit in ward number 3. The availability of land with improvement in public transport network helped in the expansion of the neighbouring ward numbers 4 and 5. Markets for daily consumables grew up accordingly.

We have compared here the first 25 wards from 30 wards of the city in 1991. However, small non household industrial units were also started to growing in the peripheral wards

The information regarding the concentration of industries is compiled by the author from the data available from Sub DIC, Durgapur.

like 29, 30 in 1991 due to expansion of road network like construction of NH2 Bypass. A significant percentage of male population (15% to 23 %) engaged in the non household industries started to reside in these new wards. It proved that the city expanded in spatial size as land was not available or too expensive near the G.T. Road or the CBD area. The planned Kalyanpur housing estate area for middle income service groups was built in the 80's in the north western periphery of the city in ward number 30. Public Transports in the form of new bus routes were started to develop in these newly urbanised areas. Another sub centre was developing there with the improvement in built infrastructure like road network, new schools and increase in public transport.

The study of spatio-temporal changes made it clear that there were a number of emergent features behind the urbanisation of Asansol city. Moreover the study shows that improvement in transport network played a major role in the development of the sub centres.

## 5. Spatial and Economic Changes in Asansol city during 1991-2001

Asansol city turned bigger by five times during 1991-2001. The city expanded in spatial area and transformed into the highest local municipal body, the Municipal Corporation in 1994. The places which were added to the Asansol Municipality were the erstwhile Burnpur Notified Area Authority and the erstwhile Asansol CD Blocks. Map 5.1 shows the total area of Asansol Municipal Corporation in 2001. The shaded area was that of the erstwhile municipality.

Map 5.1
Asansol Municipal Corporation
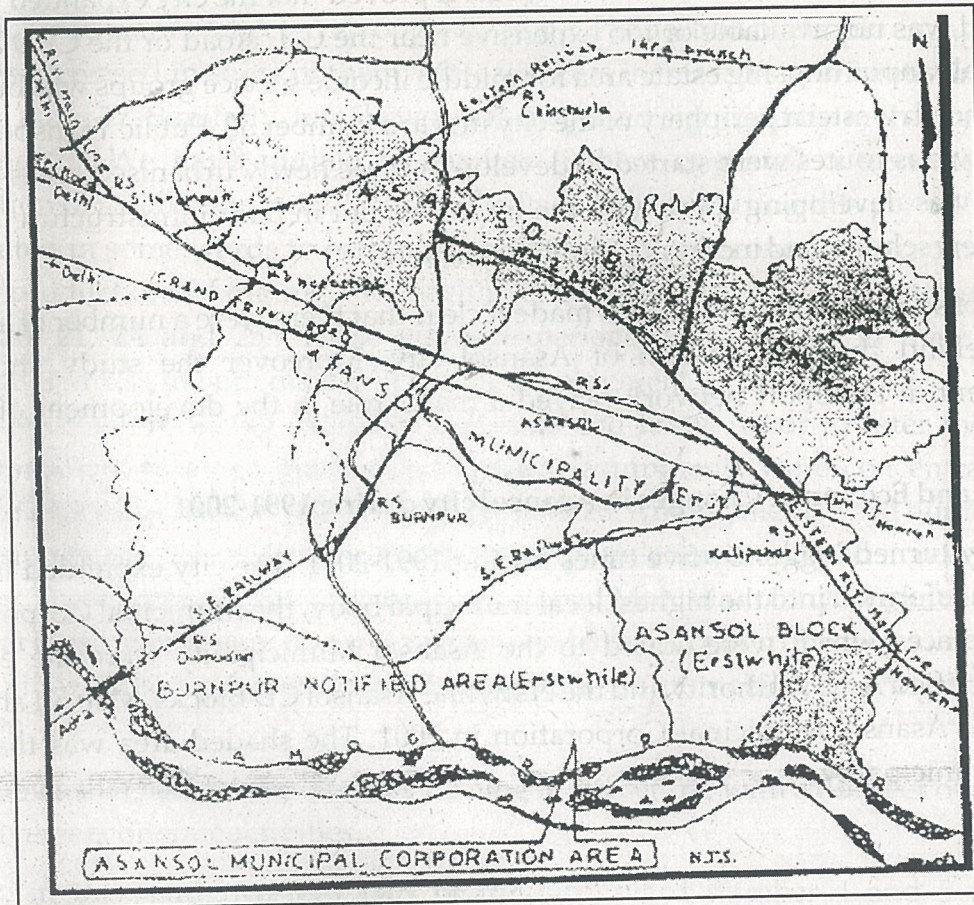


Source: Introspection (2001), Asansol Municipal Corporation, Asansol

Besides the Burnpur Notified Area and some non municipal towns, a number of villages which were not part of the Asansol city in 1991 get amalgamated with the erstwhile municipality as new wards by administrative decision.

Table 5.1 informs us about the expansion of spatial area and the number of wards in the city during 1991-2001.
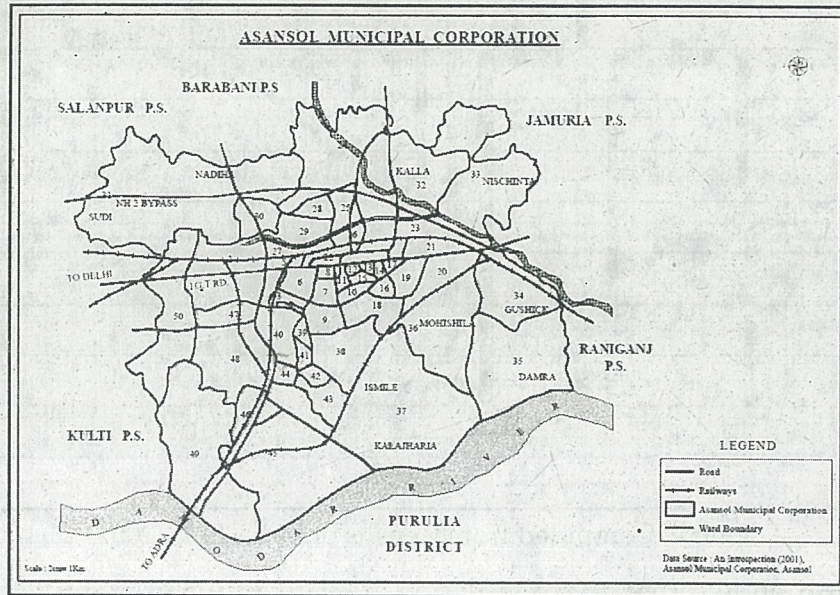
Table 5.1
Area & Number of Wards 1991 and 2001

| Year | Area (in sq km) | Number of Wards |
|------|------|------|
| 1991 | 25.02 | 30 |
| 2001 | 127.87 | 50 |

Source: Census of India, District Census Handbook for Barddhaman 1991 and 2001.
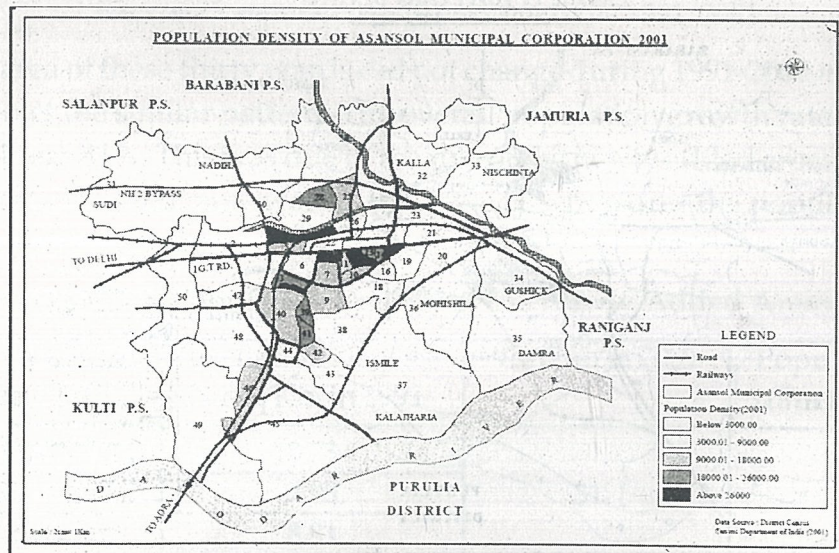
The arrangement of the wards in the Asansol city is shown in the map 5.2 below.

Map 5.2



Map 5.3 shows the population density in all the fifty wards of Asansol Municipal Corporation in 2001.

Map 5.3



To see the pattern of urbanisation in the different wards, we compared the population density figures of the first thirty wards of Asansol Municipal Corporation with the erstwhile thirty wards of the former Municipality in the Fig 5.1 below.

## Fig 5.1 Change in Population Density 1991-2001
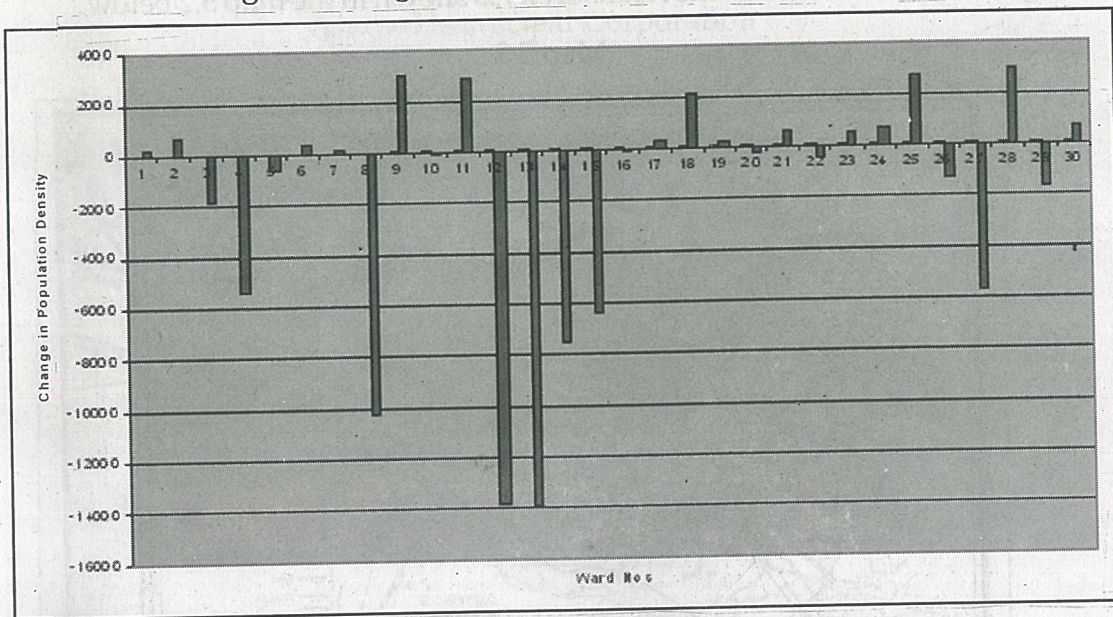


Source: Computed from Census of India 1991, 2001.

The above graph shows that the population density reduced significantly in a large number of wards. The change in the population density in the Asansol city, 1991-2001 is shown in the map 5.4 below.

Map 5.4
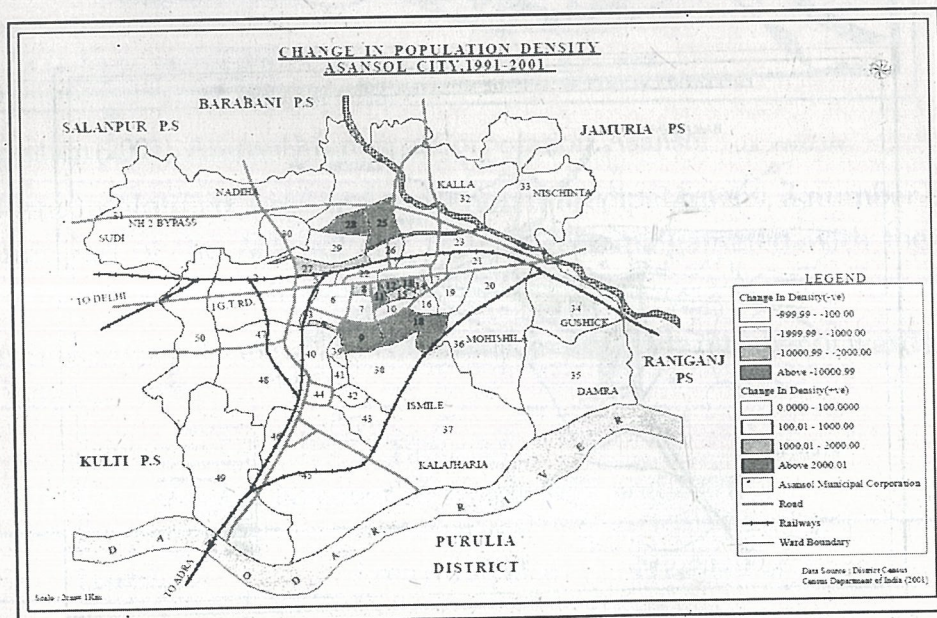


To find out the pattern of urbanisation in these wards, we look into the growth rate of population in these thirty wards from the Fig 5.2 below.

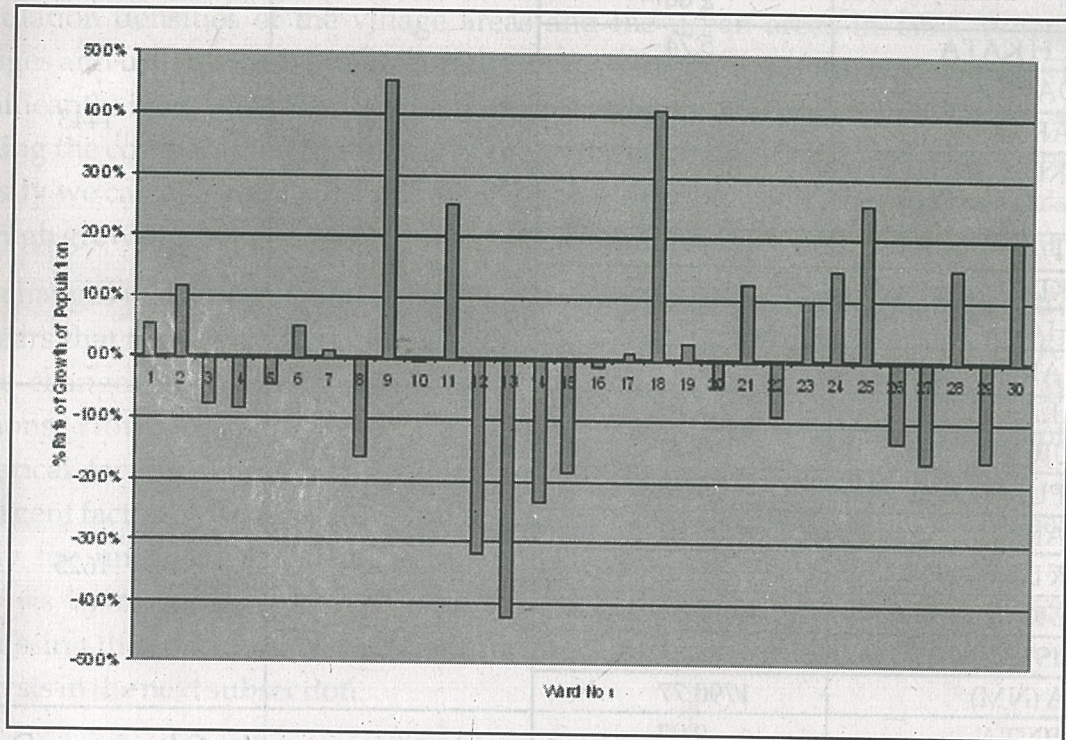Rate of Growth of Population (in percentage)
1991-2001



Fig 5.2
Source: Computed from Census of India 1991, 2001.

As the spatial area of these thirty wards did not change during 1991-2001, the above Fig 5.1 and Fig 5.2 depict the similar pattern. The overall population growth rate (unadjusted) of the city in 2001 was 81%. This was due to the role of the newly added areas. Thus to see the urbanisation pattern in the new wards, the Table 5.2 compares the population density of these places[5] in 1991 with 2001.

Table 5.2: Population Density of the Newly Added Areas

| Name of the villages & Urban Area 1991 | Population Density Per sq Km in 1991 | Ward no in 2001 | Population Density Per sq Km in 2001 |
|---|---|---|---|
| PALASHDIHA | 13.73 | 31 | 1443 |
| GOPALPUR | 7.98 | | |
| RAMJIBANPUR | 8.81 | | |
| RAGHUNATH BATI | 13.30 | | |

[5]The areas of four villages which became incorporated in ward number 31 are not reported in the 2001 census record. Information regarding the area of the newly added spaces and total population as in 1991 is in Appendix Table 5.1. It has not been possible to identify the specific newly added areas which developed into the ward numbers 34 and 36 in 2001.

| Name of the villages & Urban Area 1991 | Population Density Per sq Km in 1991 | Ward no in 2001 | Population Density Per sq Km in 2001 |
|---|---|---|---|
| SUDI | 4.99 | | |
| MARICH KATA | 5.74 | | |
| GOBIDAPUR | 6.58 | | |
| BANSARAKDI | 12.14 | 31 | 1443 |
| SARAKDI NADIHA (NM) | 823.05 | | |
| GARUI | - | | |
| SARAKDI | - | | |
| NADIHA | - | | |
| HATGARUI | - | | |
| SHITALA | 37.16 | | |
| MAHUJURI | 10.42 | | |
| BARAPUKURIYA | 8.26 | | |
| GARPARIA | 15.02 | | |
| UTTAR DHADKA | 19.10 | 32 | 1625 |
| SAT PUKURIA | 7.51 | | |
| BAN BISNUPUR | 14.61 | | |
| KALLA (NM) | 1790.77 | | |
| NISCHINTA | 9.02 | | |
| KESHABGANJ | 7.03 | 33 | 1188 |
| CHAK KESHABGANJ | 5.87 | | |
| KANKHYA (NM) | 2875.91 | | |
| DAMRA | 10.96 | 35 | 852 |
| BURNPUR (NA) | 2659.96 | 37 | 611 |
| | | 38 | 3637 |
| | | 39 | 23484 |
| | | 40 | 11795 |
| | | 41 | 21032 |
| | | 42 | 12654 |
| | | 43 | 6588 |
| | | 44 | 8177 |
| | | 45 | 847 |
| | | 46 | 12477 |
| | | 47 | 8096 |
| | | 46 | 2474 |
| | | 49 | 857 |
| | | 50 | 1729 |

Source: Computed from the Census of India 1991 and Census of India 2001-Provisional Population Totals.

The above table shows that in 1991 the population densities were high only in the non municipal towns and in the Burnpur Notified Area. Population density was very low in the villages when they were not part of the city. A wide disparity was noticed among the population densities of the village areas and the urban areas in 1991. When all these villages and urban areas became part of the city we see that population densities increased significantly in the new wards which incorporated these places. Thus though we are not finding the comparable growth rate of these places but looking into the rise of population density we can assume a considerably high rate of population growth here. This explains the high growth rate of Asansol Municipal Corporation as a whole to some extent.

The changes in the population density indicated the further development of sub centres. It appears that the city is becoming a multi centric one in 2001. There are many reasons for these changes in population density. We have discussed some of them in the earlier sections. However there were other socio-economic, demographic, geographical and historical factors which could affect population density pattern in a city. Moreover emergent factors with passage of time could influence the residential location decision. To study the impact of them on population density we are undertaking the regression analysis by considering the 1991-2001 data. For that, in the following section we are discussing the conceptual framework for choosing these variables followed by statistical analysis in the next subsection.

## 6. A Conceptual Outline and the Methodology

The intensity of land use in a city as mentioned above depends on a number of factors. The explanatory variables which assumed to have effect on population density of the wards and in turn shape the urbanization process of Asansol are:

i) Orthogonal Distance of the wards from the Grand Trunk Road

ii) Radial Distance of the wards from the rail station area

iii) The square of the distance of the wards from the rail station

iv) The north- south dummy variable

v) Work participation rate for male main worker

vi) Gender ratio

vii) Literacy rate of female population

We are summarising the reasons for selecting the above explanatory variables as follows:

In Asansol, the prevailing public transport mode during 1991-2001 consisted of buses, mini buses and rail transport. Rail network as the earlier chapter studied played an important role in the agglomeration economies of this region. However, as we have

discussed in the earlier sections here that in the intra city equitable development, the availability of necessary road transport network was also equally important. Therefore we have considered the orthogonal distance of the wards from the G.T. Road, radial distance of the wards from the rail station and the square of the distance of the wards from the rail station to examine the impact of physical accessibility on residential population density in the wards here.

Grand Trunk Road divided the city into two parts. The larger southern part was more congested with a larger number of wards and higher average population density than the northern part.[6] We are considering the north- south dummy variable to see whether any difference exists in the settlement pattern between the northern and the southern part of the city.

To analyse the impact of accessible transport on population density in the wards in the northern and the southern parts of the city, the following methodology is followed:

a) The wards are grouped according to their orthogonal distance from the Grand Trunk Road, in Table 6.1. The wards located within average distance of 2 Kms from the Grand Trunk Road are either belong to or adjacent to the Central Business District. The wards at an average distance of 4 Kms and above are peripheral wards.

Table 6.1
Location and Distance of the Wards from the G.T road, 2001

| Average Distance from Grand Trunk Road (in Kms ) | Location / Ward Number | | Number of Wards | |
|---|---|---|---|---|
| | North of G.T road | South of G.T Road | North | South |
| 0.0-2.0 | 2, 5, 21, 22, 23, 24, 25, 26, 27, 29, 30, 32, 33 | 1, 3, 4, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 34, 47, 50 | 13 | 21 |
| 2.1– 4.0 | 28, 31 | 36, 38, 39, 40, 41, 42, 44, 48 | 2 | 8 |
| 4.1-5.2 | - | 35,37,43,45,46,49 | - | 6 |

Source: Computed from the Map of Asansol Municipal Corporation

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[6]The information regarding the number of wards in the northern/southern part of the G.T Road and their average population density is in Appendix Table 5.2

b). The rail station and the adjacent business areas is our perceived city centre; it is ward 22, the ward which accommodates the rail station and at present the Central Bus Stand. It is well connected with the rest of the city. To study the accessibility criteria, the distances of the wards from the city centre have been calculated. Concentric circles are drawn from the rail station taking the distance from one circle to another as 1 km. For instance, the radius of the innermost circle is 1 km, next is 2 km. They are grouped in Table 6.2 as follows.

Table 6.2

Location and Distance of the Wards from the Rail Station, 2001

| Average Distance from the rail station (in Kms) | Ward Number | Total Number of wards |
|---|---|---|
| 0.5 | 22, 23, parts of 17,19, 20,21,24 and 32 | 8 |
| 1.5 | 13,14,16,remaining parts of 19,20, 21, 24, 27 parts of 25, 26, 32 and 33 | 10 |
| 2.5 | 11, 12,15,Parts of 8,9,10, 18,25,26,28,29,32, 33 ,34 36 , 37 and 38 | 13 |
| 3.5 | 7,8, 28,Parts of 5, 6,9,32,33, 34,36,37and 38, | 11 |
| 4.5 | 3,39,remaining parts of 5,6, 33,38, parts of 1,2,30,31,34, 35,36, 37 ,40 and 41, | 16 |
| 5.5 | 4,40,41,42, parts of 2,1,30,31, 32,34,35,37,42, 43 and 44 | 13 |
| 6.5 | Parts of 1,2,35,31,37,44,45, 47,48,45,46,47 and 48 | 13 |
| 7.5 | Parts of 1,2,31,37,45,46, 47,48 and the beginning of 50 | 8 |
| 8.5 | 49,50,parts of 31 and 37 | 4 |

Source: Computed from Map of Asansol Municipal Corporation

The wards within the average distance of 2.5 Kms from rail station are adjacent to the city centre or some of them are parts of the CBD area. The wards which are at an average distance of 7.5 Kms from the rail station are in less accessible locations with respect to railway facilities.

The next component, the Main Work participation rate of male population is an indicator of the economic condition and thus expected to influence the population density in a space.

Since Asansol is a built space consisting of basic and heavy industries besides coal mines and rail, the predominant workers are male. So we have chosen male main work participation rate for more detailed study.

Theoretically, gender ratio is an indicator of the settlement pattern. As Asansol is a city which is known as the hub of the mining, industrial and trading centre, people resided here mainly for fulfilment of economic objectives. The study thus anticipates a negative relationship between the gender ratio and intensity of land use. Population density is high in those parts of this industrial city where the labourers and people connected to different business activities live. But that are not developed organised spaces to live with families.

Again, the bottom most explanatory variable, literacy rate of female population is also a measure of the settlement pattern because high female literacy rate is an indication of progressive society. Theoretically, literacy rate for female is negatively related to population density as it is high only in upper middle class areas where intensity of land use is comparatively low. From the regression analysis in the next sub section, we can know whether they are statistically significant or not.

All the relationships hypothesized here are tested in the next sub section in a regression framework.

**Statistical Analysis**

Regression analysis has been done by using SPSS software package to test the conceptual framework and for supporting the theoretical argument. To make the distribution more symmetric, logarithmic transformations have been done. We have checked the correlation matrix which shows very low levels of correlation between two or more predictors. So the problem of multi co-linearity does not arise.

The data sets computed from the Census report of 1991 and 2001 are shown in the following Tables 6.3, 6.4 and 6.5.

Table 6.3
Resultt of Regression Analysis
Year 1991, No of wards – 30
Dependent variable (Y): log population density, 1991

| Independent Variables | Regression coefficients |
|---|---|
| Radial Distance from rail station | 2.418*** |
| Square of the distance from rail station | – 2.309*** |
| Orthogonal Distance from G.T Road | – 0.296* |
| Gender ratio | – 0.548*** |

| | |
|---|---|
| Work Participation Rate Male Main | – 0.245 |
| Female Literacy Rate | – 0.052 |
| North-South Dummy | 0.395* |

Adjusted $R^2$ = 0.524    F = 5.568***

[* for significant at 10%, ** for significant at 5% and *** for significant at 1% besides the values.]

As $R^2$ is 0.524, the regression is a good fit. The overall regression model with all the independent variables included is statistically significant as F is statistically significant.

Table 6.4 and 6.5 are based on 2001 census report. Table 6.4 consists of the data set of the old thirty wards and not the newly added twenty wards for comparative analysis.

Table 6.4
Result of Regression Analysis
Year 2001, No of wards – 30
Dependent variable (Y): log population density, 2001

| Independent Variables | Regression coefficients |
|---|---|
| Radial Distance from rail station | 1.566** |
| Square of the distance from rail station | – 1.301** |
| Orthogonal Distance from G.T Road | – 0.494*** |
| Gender ratio | – 0.345* |
| Work Participation Rate Male Main | – 0.261 |
| Female Literacy Rate | – 0.110 |
| North-South Dummy | 0.322* |

Adjusted $R^2$ = 0.378, F = 3.519***

Here $R^2$ is 0.378 so the regression is a moderate fit.

Table 5.13 shows the regression calculated from the set of population data of 50 wards of Asansol Municipal Corporation in 2001.

Table 6.5
Result of Regression Analysis
Year 2001, No of wards – 50
Dependent variable (Y): log population density, 2001

| Independent Variables | Regression coefficients |
|---|---|
| Radial Distance from rail station | 0.934** |

| | |
|---|---|
| Square of the distance from rail station | -1.025*** |
| Orthogonal Distance from G.T Road | -0.336** |
| Gender ratio | -0.239** |
| Work Participation Rate Male Main | -0.083 |
| Female Literacy Rate | 0.620*** |
| North-South Dummy | 0.027 |

Adjusted $R^2$ = 0.614    F = 12.124***

Since $R^2$ is 0.614 here, the regression is a good fit.

We summarise the main findings below and sorting out the inconsistencies since the test of hypothesis does not match with the conceptual understanding in some cases.

The above tables show that the explanatory variables denoting physical accessibility are the most important link with population density. This confirms that the intensity of land use and physical accessibility in the form of built infrastructure transport network go together. Physical accessibilities from the CBD area as measured by the radial distance from rail station and the square of the distance from the rail station emerge as statistically significant explanatory variables in both 1991 and 2001. Residential population density was low near the rail station i.e. the CBD area as expected. It was more profitable to use land there for non residential business activities. Moreover, adjacent to the rail station there were built spaces owned by railway authority for administrative set up and service quarters. As land was scarce there, naturally the rent and price was expected to be very high and individuals had to stay at a distance from the rail station. The city expanded accordingly, transport network evolved and sub centres were created to cater the various needs of the residential population. Again, the radial distance from the rail station emerges as a stronger statistically significant explanatory variable when the observation was based on erstwhile 30 wards instead of the 50 wards in 2001. This is because the newly added wards were at a greater radial distance from the rail station. Some of these wards were agricultural and mining areas which needed more land for production activities. Thus residential population density was lesser than the erstwhile thirty wards.

Transport facilities were not developed in the fringe areas. So population density was low there in 1991. When the city expanded spatially in 2001, the relation followed the same pattern because the development of public transport network was not uniform in these areas.

The orthogonal distance from G.T. Road emerges as a statistically significant variable at 10% level of significance in 1991. It emerges as more significant when we consider the old

30 wards of AMC in 2001. It also contributed significantly to the population density changes when the study considers all the fifty wards in 2001.

As mentioned earlier the expansion of the city over time was along the two sides of the G.T. Road. There was lack of adequate built infrastructural development in road and transport network in the areas away from the G.T. Road. Thus population density was high near the G.T. Road in 1991. During the decade 1991-2001, infrastructural development in road construction and public transport network expanded in some other areas of the old city. The automobile ownership of the residents also increased than in the earlier decades as it became easier to commute by motorised transport. We have also mentioned earlier that sub centres have evolved in these wards. But, as we have mentioned earlier, the spatio-economic characteristics of the newly added twenty wards were different from the erstwhile wards. G.T. Road was lifeline for the population there as rail station was far away and CBD is adjacent to the rail station. Moreover most of these new wards lacked the non basic activities like educational institute and health infrastructure for which they needed the G.T. Road to avail themselves of these facilities. Thus distance from the G.T. Road is statistically significant in all the analysis.

Gender ratio as anticipated is statistically significant in all the statistical analysis. However, it emerges as a stronger variable in 1991 than in 2001. This is because the city expanded vertically during this decade in the majority of the old thirty wards where there were advantages of non basic activities. Thus more people can reside with family in the same area in 2001 than in 1991. Thus the explanatory variable gender ratio becomes a significant predictor for population density changes only at 10% level of significance. However, it contributed significantly to the population density changes at 5% level of significance when we consider all the fifty wards. We have already mentioned that the spatio economic character of the newly added wards was different from the old wards. Vertical space in the form of multi storied apartment was not developed there because a large part of the land there was owned by IISCO and ECL authorities. There were residential family quarters for the middle and high income earners where intensity of space uses were considerably high. Besides some wards were tribal inhabited areas with few urban amenities.

The work participation rate of male main workers is not statistically significant in all the above three tables. Thus, in Asansol, the residential location decision was not determined by the number of workers in the localities in 1991 and 2001.

Female literacy emerges as a statistically significant variable for population density changes only in 2001 where we consider all the fifty wards. The upper middle and high income earners whose female literacy rate was high shifted from the old city to the new areas. Lands were available there and these people could enjoy more space in these areas.

Moreover, female literacy was comparatively high due to incorporation of the Burnpur Notified Area as it was the residential area of the middle and higher income population employed in the public sector steel industry.

In 1991, the North-South dummy variable contributed significantly to the population density changes. In the northern part there were lands owned by the railway authority. The rail station was in the northern part. There were some of the oldest parts of the Asansol town where poor minority communities live from earlier days. There were also mining areas where there were restrictions on private ownership of land. Moreover the northern part lacked the built infrastructural facility and NH-2 Bypass was not constructed then. For these reasons, residential population density was higher in the southern part and thus north-south dummy variable emerges as a statistically significant predictor for population density changes. When we consider the old thirty wards of the city, the north-south dummy variable again emerges as a significant predictor for population density changes. The construction of NH-2 did not change the population density variation in the two parts of the G.T. Road. This is because most of these thirty wards were away from the new Bypass. Sub centres in these wards also grew in the southern part of the G.T. Road. However, the north south dummy variable is not significant when we consider all the fifty wards in 2001. The industries and the mining sector were passing through a slump in the decade 1991-2001, Asansol being a reputed trade and transport centre, people pressed upon the G.T Road both in the north and south. With the expansion of the city along either side of the G.T. Road both in the north and the south, the habitation along the G.T. Road also expanded. The new wards in the north are adjacent to the NH-2 Bypass. The development of the transport network here led to rise in population density in both parts. Moreover, as land was scarce or the rent was high in the southern part where urban infrastructure was more developed, people settle in the northern part near the G.T. Road. The new Satellite Township was constructed in the northern part. Sub centres grew up in the newly added areas due to the creation of built space like schools, engineering college and hotels. Moreover some of these activities which were in the erstwhile municipality areas along the G.T. Road earlier shifted their activities in the northern part of the newly added areas beside the By Pass. For instance a reputed school in the city relocated their activities beside the Bypass here. As the school became large with more students, it needed more space which was not possible where it was located earlier due to scarcity of land. So it shifted to the new location because of the availability of required land. It gradually emerges as a new sub centre with increasing residential population density adjacent to it.

## 7. Conclusion

Thus along the passage of time, the rate of urbanisation increased and sub centres started to evolve depending on external economies. A social agglomeration tendency was also noticed in some places. The empirical findings reveal that residential location patterns in

the different wards of the Asansol city is more influenced by the formation and evolution of built infrastructure Thus in the inner city they played an affirmative role. In 1951, non residential business activities were concentrated around the then city centre comprised of the neighbourhood of the railway station in the north of the Grand Trunk Road and the market in the south of the this road. Absence of suitable routes connecting the other areas initially made these locations adjacent to the rail station and along the Grand Trunk Road the most valuable. They offered the advantage of low transport cost, greater accessibility to the input market, and a greater range of economies of scale. The rapid rise of residents in the city over time changed the structural composition of the ward. The city turned bigger during these twenty years. As the Grand Trunk road is also parallel to the rail route, the residential population densities were higher adjacent to the road. Residential population density was low near the rail station because it was the CBD area there were built spaces owned by railway authority for administrative set up and service quarters. The population density increased initially at a distance from the rail station and the CBD area. As in the earlier decades, there was lack of adequate built infrastructural development in road and transport network in the areas away from the G.T. Road. The expansion of the city over time was along the two sides of the G.T. Road. The spill over of the urban population was due to the reason that land was not available or too expensive near the G.T. Road or the CBD area. Transport network evolved and sub centres were created to cater the various needs of the residential population. The city gradually turned from a mono-centric to a multi-centric one over the period of fifty years. The small scale manufacturing units were concentrated in some wards to gain the benefit of external economies of some sort. Residential population density was high in the areas where non basic activities were available. Vertical space[7] in the form of multi storied apartment was built in some of the old thirty wards. The spatio economic character of the newly added wards was different from the old wards. Vertical space for general population was not developed there because a large part of the land there was owned by IISCO and ECL authorities. There were residential family quarters for the middle and high income group employees where intensity of space uses were considerably high. Some of these wards were agricultural and mining areas. A few were tribal inhabited areas with few urban amenities. Thus residential population density was lesser than the old thirty wards.

The empirical findings reveal that population density changes in Asansol in 1991-2001 is influenced by the physical accessibility in the form of rail and roadways, gender ratio, literacy rate of female population and the location of the wards in the northern or the southern part of the G.T. Road. Thus residential location patterns in the different wards of the Asansol city is influenced by a coordination of socio-economic, demographic, geographical and historical factors.

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[7] Vertical growth in the city can influence the population density pattern in a city. But we do not have authentic information about the size and height of the structures on ward level.

The construction of NH2 Bypass and the inflow of capital in the tertiary sectors like private technical education institutes after the set back of manufacturing sectors helped in the emergence of new sub centres especially in the northern fringe area. The availability of land helped in the expansion of increasing residential population density adjacent to it.

Ours has been rather an attempt at the application of a few general theories on urbanisation as noted above to understand the dynamics of the city of Asansol. But other components could be also there to any urban growth or deceleration. They might be accidental ones such as land subsidence, destruction of environment and so on. Asansol region being a mining based industrial one is faced with recurrent land subsidence, underground fire, pollution, water crisis and loss of fertility of agricultural land. They surely need special attention from scholars on humanitarian ground and in the interest of economic prosperity of our count.

# Appendix

## Appendix Table 1

The Area and Total Population of the Villages and Urban Areas in 1991 which became part of the Asansol City in 2001

| Name of the villages & Urban Area, 1991 | Ward No In 2001 | Area per sq km in 1991 | Population in 1991 |
|---|---|---|---|
| GARUI | | | 1135 |
| PALASHDIHA | | 50.97 | 700 |
| SARAKDI | | - | 925 |
| NADIHA | | - | 1008 |
| GOPALPUR | | 67.57 | 539 |
| HATGARUI | 31 | - | 362 |
| RAMJIBANPUR | | 90.22 | 795 |
| RAGHUNATH BATI | | 85.54 | 1138 |
| SUDI | | 192.49 | 960 |
| MARICH KATA | | 159.87 | 917 |
| GOBIDAPUR | | 164.86 | 1085 |
| BANSARAKDI | | 77.59 | 942 |
| SARAKDI NADIHA (NM) | | 5.90 | 4856 |
| SHITALA | | 45.53 | 1692 |
| MAHUJURI | | 78.04 | 813 |
| BARAPUKURIYA | | 161.20 | 1331 |
| GARPARIA | 32 | 171.64 | 2577 |
| UTTAR DHADKA | | 91.24 | 1743 |
| SAT PUKURIA | | 181.33 | 1362 |
| BAN BISNUPUR | | 65.28 | 954 |
| KALLA (NM) | | 2.60 | 4656 |
| NISCHINTA | | 398.39 | 3592 |
| KESHABGANJ | 33 | 60.14 | 423 |
| CHAK KESHABGANJ | | 69.79 | 410 |
| KANKHYA (NM) | | 1.37 | 3940 |
| DAMRA | 35 | 344.65 | 3779 |
| BURNPUR (NA) | 37-50 | 65.79 | 174933 |

Source: Census of India 2001-Provisional Population Totals, Census of India 1991

## Appendix Table 2

Location of the wards and their Average Population Density in North/ South part of the G.T Road in Asansol, 2001

| Location(North/South) | Ward Number of Wards | Total Number | Average Population Density |
|---|---|---|---|
| North of G. T. Road | 2, 5, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33 | 15 | 8688 |
| South of G. T. Road | 1, 3, 4, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 34-50 | 35 | 13740 |

Source: Asansol Municipal Corporation

## Appendix Table 3

Data Set for Regression Analysis, 1991 and 2001

| WARD NO | N (0) - S (1) OF GT RD | DIST FROM RAIL STN (KM) | DIST FROM G.T ROAD (KM) | POPULATION DENSITY | | GENDER RATIO | | FEMALE LITERACY RATE | | MALE MAIN WPR | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | '91 | '01 | '91 | '01 | '91 | '01 | '91 | '01 |
| 1 | 1 | 6.64 | 0.66 | 4955 | 5211 | 833 | 964 | 77.7 | 84.8 | 49.8 | 49.1 |
| 2 | 0 | 6.00 | 0.55 | 5977 | 6670 | 853 | 933 | 61.1 | 83.5 | 47.2 | 49.7 |
| 3 | 1 | 4.73 | 1.60 | 24409 | 22546 | 804 | 900 | 80.5 | 88.4 | 47.4 | 45.0 |
| 4 | 1 | 5.00 | 0.28 | 66321 | 60926 | 806 | 877 | 72.9 | 80.8 | 39.4 | 39.6 |
| 5 | 0 | 4.00 | 0.28 | 13043 | 12437 | 862 | 978 | 79.7 | 83.0 | 43.8 | 50.4 |
| 6 | 1 | 4.00 | 0.55 | 7871 | 8263 | 914 | 925 | 76.8 | 90.0 | 39.7 | 44.2 |
| 7 | 1 | 3.45 | 0.99 | 13302 | 13456 | 879 | 899 | 72.4 | 81.9 | 38.1 | 48.5 |
| 8 | 1 | 3.00 | 0.28 | 62737 | 52554 | 868 | 896 | 74.0 | 77.8 | 45.0 | 44.4 |
| 9 | 1 | 4.00 | 2.09 | 6735 | 9796 | 870 | 933 | 76.7 | 83.4 | 49.0 | 44.8 |
| 10 | 1 | 2.55 | 1.10 | 17292 | 17175 | 868 | 934 | 82.8 | 88.0 | 49.1 | 48.4 |
| 11 | 1 | 2.64 | 0.44 | 11702 | 14634 | 801 | 908 | 85.1 | 86.8 | 49.9 | 42.5 |
| 12 | 1 | 2.36 | 0.17 | 43128 | 29359 | 841 | 885 | 77.5 | 88.9 | 49.7 | 47.6 |

| WARD NO | N (0) - S (1) OF GT RD | DIST FROM RAIL STN (KM) | DIST FROM G.T ROAD (KM) | POPULATION DENSITY | | GENDER RATIO | | FEMALE LITERACY RATE | | MALE MAIN WPR | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | '91 | '01 | '91 | '01 | '91 | '01 | '91 | '01 |
| 13 | 1 | 2.00 | 0.17 | 32796 | 18920 | 705 | 859 | 75.0 | 87.7 | 58.2 | 54.3 |
| 14 | 1 | 1.73 | 0.55 | 32105 | 24573 | 737 | 916 | 81.1 | 87.0 | 58.4 | 55.6 |
| 15 | 1 | 2.00 | 0.55 | 34677 | 28328 | 771 | 821 | 75.8 | 84.2 | 49.8 | 49.6 |
| 16 | 1 | 1.73 | 1.10 | 8388 | 8283 | 827 | 926 | 74.9 | 80.2 | 52.5 | 53.3 |
| 17 | 1 | 1.00 | 0.22 | 26017 | 26291 | 814 | 896 | 74.2 | 83.5 | 48.9 | 49.4 |
| 18 | 1 | 2.45 | 1.87 | 5119 | 7219 | 938 | 953 | 74.1 | 83.4 | 49.9 | 49.6 |
| 19 | 1 | 1.00 | 0.66 | 8623 | 8865 | 846 | 920 | 66.3 | 80.5 | 52.2 | 48.6 |
| 20 | 1 | 1.36 | 0.55 | 6110 | 5869 | 873 | 899 | 68.1 | 79.0 | 46.8 | 46.4 |
| 21 | 0 | 0.70 | 0.28 | 5041 | 5677 | 735 | 895 | 74.8 | 85.2 | 46.8 | 47.6 |
| 22 | 0 | 0.00 | 0.44 | 5448 | 4945 | 720 | 862 | 59.8 | 72.8 | 47.9 | 48.3 |
| 23 | 0 | 1.00 | 1.21 | 4684 | 5156 | 818 | 849 | 67.6 | 69.2 | 38.0 | 39.6 |
| 24 | 0 | 1.45 | 1.27 | 4498 | 5160 | 836 | 906 | 72.1 | 74.4 | 44.7 | 42.4 |
| 25 | 0 | 2.36 | 2.26 | 10781 | 13528 | 813 | 833 | 58.9 | 72.2 | 43.1 | 42.4 |
| 26 | 0 | 2.00 | 0.77 | 9297 | 8058 | 753 | 865 | 56.1 | 75.9 | 47.6 | 47.8 |
| 27 | 0 | 3.00 | 0.55 | 34764 | 29024 | 832 | 910 | 75.3 | 80.8 | 40.3 | 40.9 |
| 28 | 0 | 3.45 | 2.48 | 19600 | 22564 | 870 | 899 | 49.7 | 65.9 | 37.3 | 36.7 |
| 29 | 0 | 4.00 | 1.54 | 10255 | 8612 | 845 | 922 | 56.2 | 65.1 | 38.2 | 36.7 |
| 30 | 0 | 5.45 | 2.42 | 3533 | 4247 | 873 | 924 | 85.1 | 87.0 | 47.2 | 42.1 |
| 31 | 0 | 8.00 | 2.75 | - | 1443 | - | 907 | - | 59.5 | - | 34.0 |
| 32 | 0 | 2.00 | 1.49 | - | 1625 | - | 921 | - | 49.0 | - | 29.9 |
| 33 | 0 | 2.45 | 1.93 | - | 1188 | - | 913 | - | 54.3 | - | 27.6 |
| 34 | 1 | 4.00 | 1.38 | - | 2041 | - | 848 | - | 44.5 | - | 33.7 |
| 35 | 1 | 5.00 | 4.51 | - | 852 | - | 906 | - | 55.6 | - | 36.5 |
| 36 | 1 | 3.00 | 2.97 | - | 1290 | - | 865 | - | 52.7 | - | 31.3 |

| WARD NO | N (0) - S (1) OF GT RD | DIST FROM RAIL STN (KM) | DIST FROM G.T ROAD (KM) | POPULATION DENSITY | | GENDER RATIO | | FEMALE LITERACY RATE | | MALE MAIN WPR | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | '91 | '01 | '91 | '01 | '91 | '01 | '91 | '01 |
| 37 | 1 | 5.36 | 5.34 | - | 611 | - | 903 | - | 41.1 | - | 31.5 |
| 38 | 1 | 4.00 | 3.91 | - | 3637 | - | 898 | - | 69.7 | - | 33.1 |
| 39 | 1 | 4.82 | 2.42 | - | 23484 | - | 881 | - | 73.6 | - | 34.3 |
| 40 | 1 | 5.82 | 2.86 | - | 11795 | - | 859 | - | 65.5 | - | 36.1 |
| 41 | 1 | 5.00 | 3.41 | - | 21032 | - | 904 | - | 88.8 | - | 43.8 |
| 42 | 1 | 5.18 | 4.29 | - | 12654 | - | 837 | - | 86.5 | - | 46.5 |
| 43 | 1 | 5.73 | 5.45 | - | 6588 | - | 887 | - | 73.8 | - | 37.5 |
| 44 | 1 | 6.00 | 4.02 | - | 8177 | - | 882 | - | 85.7 | - | 43.1 |
| 45 | 1 | 7.00 | 5.78 | - | 847 | - | 906 | - | 73.1 | - | 33.3 |
| 46 | 1 | 7.45 | 5.23 | - | 12477 | - | 901 | - | 69.7 | - | 38.1 |
| 47 | 1 | 7.00 | 1.49 | - | 8096 | - | 820 | - | 67.5 | - | 40.4 |
| 48 | 1 | 7.45 | 3.41 | - | 2474 | - | 843 | - | 81.0 | - | 43.7 |
| 49 | 1 | 9.45 | 5.56 | - | 857 | - | 886 | - | 59.2 | - | 30.3 |
| 50 | 1 | 9.00 | 1.65 | - | 1729 | - | 887 | - | 63.8 | - | 34.7 |

Source: Computed from the data of District Census Handbook Census of India 1991, Census of India 2001 and Ward Map of Asansol Municipal Corporation

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