Chapter-1

Introduction
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INTRODUCTION

Urbanization is a dynamic process, which transforms the rural into urban areas and gives the impetus of growth to the other existing urban areas. Urbanization brings with it a whole gamut of social progress. It is a long term and continuous process. Urbanization is a complex phenomenon and nearly all the societies, nations, states and regions go through it. It is the process of becoming urban or to be making them urban. In real sense, the increase in the ratio of urban population is called urbanization.

Urbanization occurs when the rural character of a settlement is gradually replaced by urban character in terms of physical, socio-economic and demographic features. According to B. N. Ghose, "Urbanization is the process by which villages turn into towns and towns develop into cities." Essentially, it is an increase in the portion of people living in urban areas. This usually occurs when a country is still developing. It is both an indicator and a manifestation of economic development and social change. In the process of urbanization, the number of urban settlements and the size of population and area of an urban settlement increases with time to time. According to Kingsley Davis, "Urbanization refers to the proportion of the total population concentrated in urban settlements or else to arise in this proportion." The speed of urbanization is affected by the economy of an area. It also develops structural and behavioural changes in population.

Growing urbanization is world-wide phenomenon and it is more pronounced in developing countries of Asia. On global level number of urban population has equated rural population and after 2007 urban population is growing at a faster rate.

Since, 1950 the most rapid growth in urbanization has occurred in economically less developed countries like Asia, Africa and South America. During 1950 to 1990 the urban populations living in less economically developed countries were doubled. In India urbanization has a long past history but the country has remained prominently rural in respect of population
composition. The rate of urbanization has increased after 1951 due to the growth of secondary and tertiary sectors of economy.

Prime Minister Nehru firmly believed that “no country can be politically and economically independent unless it is highly industrialized and has developed its resources to the utmost.” Nehru’s ideas about India’s development were broadly incorporated in free India’s first Industrial Policy Resolution adopted by the constituent Assembly in 1948. In keeping with resolution it was decided to establish a chain of steel plants all over the country in the public sector. The first such plant was set up at Rourkela in Orissa followed by Bhilai in Madhya Pradesh, Durgapur in West Bengal and then followed by a steel plant at Bokaro in erstwhile Bihar (presently in Jharkhand state).

Bokaro district of Jharkhand state is highly urbanized region. The process of urbanization in this district is closely linked to the Bokaro Steel Plant and development of industrial belt and mining activities in Bermo and Phusro coal fields. Bokaro Steel Plant attracted an influx of population to the district.

In the present research work, the researcher has made an attempt to study the urban growth and challenges of Bokaro Steel City.

The present chapter is divided into three broad sections, viz.

I. Conceptual Framework

II. Review of Literature and

III. Analytical Framework

1.1 CONCEPTUAL FRAMEWORK

1.1.1 CONCEPT AND DEFINITION OF URBANIZATION

Urbanization is the process becoming urban Geographers use the term ‘Urbanization’ as the process of transformation of rural to urban. It is a dynamic process, which transforms the rural into urban area and gives the impetus of growth to the other existing urban areas. Urbanization brings with it a whole gamut of social progress. It is a long term and continuous progress. It occurs when the rural character of a settlement is gradually replaced by urban character in terms of the physical, socioeconomics and demographic features. Essentially, “it is a gradual increase in the proportion of people living in urban areas”, and the ways in which each society adapts to the whole change. According to the Encyclopaedia of Social Sciences;
Urbanization is characterized by movement of people from small communities concerned chiefly or associated with agriculture to other communities generally larger, whose activities are primarily centred in Government, trade, manufacture or allied interests (non-agricultural pattern of economy).

According to **Kingsley Davis**, urbanization is described as the shifting of population from rural areas to urban areas or change in the ratio of the total population living in urban areas. It describes both the increasing footprint of urban areas and the increasing percentage of the urban population.

It is predominantly the process by which the towns and the limits are founded and become larger as more people begin living and working in central areas. The United Nations projected that the half of the world’s population would live in urban areas at the end of 2008. It is predicted that by 2050 about 64% of the developing world and 86% of the developed world will be urbanized. Notably, the United Nations has also recently projected that nearly all global population growth from 2015 to 2030 will be absorbed by cities and about 1.1 billion has urban people over the next 15 years. According to **UNICEF**, Urbanization is the proportion of a country that is urban. Urban growth or urbanization is the relative or absolute increase in the number of people who live in towns and cities and they are primarily engaged in non-agriculture activities. The rate of urbanization is the increase in the proportion of urban population over time period. When the urban population grows at a faster rate than the total population is known as positive urbanization.

Urbanization is relevant to a range of different disciplines like geography, sociology, economics, urban planning and public health. This phenomenon has been closely linked to the modernization, industrialization and the sociological process of rationalization. According to **Nels Adnderson**, “Industrialization is the occupational or professional aspect of modern urbanization.” Urbanization can be seen as a specific condition at a set time period like the proportion of total population or area in cities or towns, as an increase in that condition over time. So, the world Urbanization can be quantified either in terms of the level of urban development relative to the overall population, or as the rate the population is increasing. According to

Urbanization is not merely considered as a modern phenomenon, but a rapid and historic transformation of human social roots on a global scale, whereby predominantly rural culture is
being rapidly replaced by predominantly urban culture. It is a complex phenomenon and nearby all the civilization, societies, nation’s states and regions go through it. It is the process of becoming urban and an indicator of economic development and social change. According to **R. B. Mandal**, the growth of population in urban areas is known as ‘Urbanization’. The gonedays have seen the birth of thousands of towns and cities, many of which have largely expended during the last 50 years. The growth is almost explosive. At present urban population explosion is found in each and every country, leading to the formation of fabroblast and sarcoma settlements “Third World Urbanization and Regional Development” (Ed. **R. B. Mandal and G. L. Peters**, Concept Publishing Co., New Delhi, 1982, pp.21-39.)

The economic development of society and the progressive division of social labour have of necessity led to the formation and expansion to towns and cities, with ever increasing migration of people to perform a wide variety of functions. Urbanization depends on the socio-economic system of the society and the rate of its development. Each nation which has founded towns and cities imparts to them, their own special appearance and their own unique content.

The urbanization as a social phenomenon seem to have percolated even in countries which were rural and the greater acceleration in growth rates have been observed for towns and cities which are old and new. It is closely associated with the spread of industry, commerce, manufacturing and the improvement of transport and industries. The main factors contributing to the urban development are as follows:-

1. Establishment of ports and harbor
2. Establishment of Municipality
3. Industrial Performance
4. Dominant Religions Centers
5. Growth of Trade and Commerce
6. Intensification of Rural –Urban migration
7. Rise of Higher Education
8. Mining Towns
9. Rise of Subdivision and District Centers
10. Hill stations and Fishing Towns

Urban growth is influenced by physical factors, socio economic factors, political factor, demographic factor, cultural factor and technological factor.
1.1.2 GROWTH OF URBAN POPULATION

Urbanization is a dynamic and continuous process, which transforms the rural character of a settlement to urban character due to growth of urban population. Growth of urban population depends upon the mainly three aspects of urbanization viz. behavioural aspects, structural aspects and demographical aspects.

Lampard (1965, p.p. 514520), suggests that a distinction should be made between the three aspects of the process of urbanization i.e.

(i) Behavioural Aspects
(ii) Structural Aspects
(iii) Demographic Aspects

(i) Behavioural Aspects of Urbanization:

The behavioural aspects of urbanization condition as the changes in the pattern of behaviour of people living in urban areas. This concept is generally associated with Louis Wisth. According to him, “it is the size of aggregate population which affects the relationship between members, where by increasing process of differentiation ultimately leads to segregation”. According to Kingsley Davis, “Urbanization represents a revolutionary change in the whole pattern of social life. It itself is a product of basic economy and technological development. It tends in turn, once it comes into being to affect every aspect of existence”.

Urban areas are the main part of the social change. Values, attitude and behavioral pattern of people are modified here. Characterized by its size, its density of population and the heterogeneity of its inhabitants, the level of interaction is extremely high here and this is the main cause of the behavioral change.

(ii) Structural Aspects of Urbanization

Structural aspects of urbanization mainly depend upon the change in the economic structure of the economic activities of the whole population. It refers to the transformation of the primarily agrarian economy to primarily industrial economy. According to the V.L.S. Prakasa Rao, “Urbanization as a process is concentration of non-agricultural occupations and land use around a single nucleus or multiple nuclei. This is primarily the result of rural to urban shift of
population with urban centers growing either at the expense of countryside or serving the countryside through modern transport and communication system”.

In the words of Thompson, “Urbanization is characterized by movement of people from small communities when activities are primarily centered in government, trade, manufacturer and allied interests.”

Thus, the structural aspects of urbanization is the transformation of a primary activity based economy like industries, factories etc.

(iii) Demographic Aspects of Urbanization

The demographic aspects of urbanization refers to the process of population of total population residing in urban areas of a given region increases and it also involves the absolute and relative growth of town and cities within a defined region, i.e. the number and size of towns in a region increases. According to this point view Hauser and Duncan, defined urbanization as “a change in the pattern of population distribution. It involves an increase in the size of urban population and growth in number of size of urban places with increasing concentration of population of such places”.

Thus, it can be said that growth of urban population is a behavioral, structural and demographic process by which villages develop into towns and towns develop into cities and cities develop into metro cities and metro cities develop into metropolitan cities.

1.1.3 DETERMINANTS OF URBANIZATION

The determinants of urbanization can be classified into three categories, i.e.

I) Social
II) Economic and
III) Demographic determinants.

According to Dr. R. C. Chandana, the economically rooted determinants are the type of economy, the degree of commercialization of agriculture, the extent of diversification of economy, the changing size of agricultural holdings, the stage of economic advancement and the degree of development of means of transportation, availability of water resource, raw material and communication. The social factors that determine the nature and magnitude of urbanization are the degree of socio-economic awakening, the social values system, the stage of technological
advancement, the public policies and government decisions. Among the demographic factors, the rate of population growth, magnitude of migration and pressure of population are significant.

(I) **Economic Determinants of Urbanization**

The economic base of urban places is very much different from that of the countryside, the economic factors gain prominence among the determinants of nature and magnitude of urbanization. Urban places which are conveniently located stimulate agricultural production and induce people into the exchange economy. Thus the expansion of urban places serving as market centers are regarded as a favourable indicator of a sound change in the economy because near urban areas commercial agriculture develops. As we know that, urban places can only exist after agricultural productivity has progressed enough to sustain people who do not grow their own food.

Generally, in societies where secondary and tertiary sectors of economy are more developed, which have an industrial base and where even the agricultural sector is highly mechanized, commercialized and based on scientific rationalization, a higher degree of urbanization is depicted and they have large size urban centers. A higher level of economic diversification and advancement and scientific and technological development leads to a higher level of urbanization. The development of transport and communication increases the accessibility of an area, breaks rural isolation and facilitates the urbanization process. The economic development of a region always leads to greater urbanization (Mandal R. B.; Urban Geography, p 365).

(II) **Social Determinants of Urbanization**

Socio-economic determinants are important factor for urbanization. Socio-economic factor is expressed through the desire of people to improve their living standards, concrete culture of the people or apartment culture, the appreciation for the benefits of urban living and break-up of the joint family system. A country which is highly developed enjoys a very high per capita income and this brings a high standard of living for its people.
This leads to urbanization. Government may take decisions to install industrial plants in rural area or a network of growth poles, peripheral areas of the towns or cities may also developed as planned manner, land utilization pattern, educational development, cultural and civic amenities development etc. All this will affect urbanization.

(III) Demographic Determinants of Urbanization

The regional differences in the rate of natural increase and the consequent migratory trends give a particular direction to the process of urbanization in any area. Urbanization is a process of population increase in urban area following some non-agricultural activities. The percentage of urban population to the total population of a country reveals the level of urban population growth. Higher is this percentage, greater is the level of urbanization and vice versa. The optimum level of urbanization depends upon the capacity of the region in providing all the amenities to the public in a fair manner. The migrant in most cases desires to move towards a big metropolitan city, ignoring all small and medium-sized towns and cities, because of the desire to live in a well known metropolitan city. The natural outcome is the overcrowding in these big cities. It is even said that many cities and towns in India are nothing but overgrown villages. This is mainly due to improved medical aid, lower death rate, increased life expectancy etc. Rural development programmes which reduce the rural-urban dichotomy and minimize the push and pull factors leading to over-urbanization of a few cities. This will also lead to balanced regional development which is necessary for achieving a high level of Socio-economic development for any nation (Mandal R. B.; Urban Geography, p 365, 367&368).

Therefore, the process of urbanization in an area is governed by the nature of its economy, social life and demographic character.

1.1.4 RELATIONSHIP BETWEEN INDUSTRIALIZATION AND PROCESS OF URBANIZATION

Industrialization is considered as the key to all economic and social development processes leading to the socio-economic transformation of a country, a state or any region.

Industrialization is the process of shifting from hand production to machine production or it is the period of social and economic change that transforms a human group from an agrarian
society into an industrial society, involving the extensive re-organization of an economy for the purpose of manufacturing.

Development of industrialization influences the process of urbanization. Urbanization is the cause of industrialization and hence they are highly correlated.

Nowadays urbanization is a great concern for the local government because the rapid growth of urban population has created environmental problems of various types (Mandal R. B.; Urban Geography, p 382).

Industrialization is the basic driving force of urbanization. The development of small industries leads to the urbanization in such areas subsequently. The development of industries in an area leads to the development of employment opportunities, new transport network, raw material, trade and commerce and public services. Industrialization subsequently attracts finance capital and human capital (money, men and material) to the place which give rise to urban centers. Industrialization and urbanization are just like brothers that grow and develop together and developed each other (Lexicon Universal Encyclopedia, 1997). Industrialization is the initiator of urbanization and urbanization is the inevitable result of industrialization.

Inventions like railroad tracks, automobiles, telephones, airplanes and electricity are a part of industrialization and the growth of cities. Urbanization occurs naturally from individual and corporate efforts to cut time and cost in commuting and transportation while improving opportunities for jobs, education, housing and transportation.

1.1.5 PATTERNS OF URBAN GROWTH

In urban centres of different population size, different types of industries predominate the scene which in turn affects the industrial environment and linkages as well.

(i) Industries of Metropolitan Centres

The metropolis of Kanpur is an industrial capital of Uttar Pradesh. It is located on the right bank of river Ganges. Besides cotton mill, Kanpur has several industries, i.e., rolling mills, engineering, chemical, plastic, medicines, paints, oil furniture, hosiery, bakery and dairy products etc. The growth of large scale industries also encourages small scale industries due to
linkage effect. Currently the manufacturing activities developed haphazardly all over the city which presents diversity in the industrial landscape of Kanpur.

The industrial concentration in the city has led to the economic prosperity and rise in the standard of living of the city dwellers by providing employment opportunities in industries and business in trade and commerce. It attracts heavy population and creates urbanization of the region.

(ii) **Industries of City Levels Centres**

Bokaro Steel City is located in Bokaro district of Jharkhand state at a distance of 260 Kms. from Patna and 300 Kms. from Kolkata. Bokaro is a monotype steel complex with six blast furnaces in the middle Damodar Valley. Bokaro gets washed coal from Dugda, Kathara, Giddi and Kargali Washeries. Iron ore is obtained from Kiriburu and Meghahatuburu mines of Bonai-Keonjhar range. Limestone is available from Bhavnathpur of Palamu district.

Water is available from Tenughat Dam and power from Chandrapura Thermal Power Station. In the early 70’s development of industrialization of the region attracted a heavy influx of migrant population to the area, resulting in the urbanization of the region.

(iii) **Industries of Small Towns**

Revelganj in Saran district of Bihar is a small town and oldest nagar panchayat whose hinterland was noted for salt-petre besides indigo production and collection centres of the district. Revelganj develops entrepot character i.e., it develop itself as a centre to which goods are brought for export and import, and for collection and distribution and transshipment led to the growth of some associated industries, i.e., boat making, blacksmith, carpentry, pottery and the making of agricultural implements are important. Wood is an important raw material and it is easily available in the nearby forest areas of Gorakhpur and Basti.

1.1.6 **RECENT POINT VIEW ON INDUSTRIAL LOCATION**

The recent trend of analyzing industrial location is not only to assess the ‘Optimum location point’ or to locate a point of ‘least-cost’ or ‘maximum profit’ or both but also to evaluate the dynamic aspect of the economics processes incorporating enhancement and efficacy
of mankind. Moreover, industrial development has now to be viewed not only from the production and employment perspective, but also from the larger perspective of social goals and spatial pattern of human activities in general. (Mishra, R.P. (1977), Growth Poles and Growth Centres in Urban and Regional Planning in India, p.11). Like most of the developing nations, India is also trying to re-orient its socio-economic set up by adopting the modern innovations and technical breakthrough for the development of regions in its vast potential backgrounds. (Mountjoy, A.B. (1966), Industrialization and under developed countries, p.165). The new Indian Industrial Policy envisages securing of such socio-economic objectives through optimum utilization of the installed capacity. It has also been for maximizing production and achieving higher productivity, higher employment generation, correction of regional imbalances through a preferential development of industrially backward areas, strengthening the agricultural base by developing agro based industries and also prompting optimum inter-sectoral relationships. However, faster promotion of export-oriented and import substitution industries would be the vital aspect. All these conditions bring a region to an economic maximization point.

In this context, it becomes most apparent to give an empirical study of the nucleus plants or the growth generating centres. These centres are located with a process of development and create ‘a zone of influence’ on the most decentralized pattern on micro, meso and macro levels. Such nucleus plants establish a linkage system based on input-output model, labour connection and even on spatial interactions, and are known as the industrial complexes.

1.1.7 INDUSTRIAL COMPLEXES

The ‘Industrial Complex’ is an economic term literally used to industrial complications in production of technology and economic growth of a region. Most of the economists like Baudeville and Perroux have called ‘growth pole’ or ‘growth centre’ to industrial complex whereas American economists, especially Isard, call it ‘Industrial Complex’.

In general industrial complex and industrial centres were considered as similar but there were difference between them. Industrial centre means a town or a city where one type or several types of large, medium or small industries or units establish just to sell out the products in the markets available, or just to enjoy the benefits of the urban agglomerations. The establishments are generally unplanned and their growth is mushroom without any strong systems or
interdependence. Technologically, these enterprises are mostly isolated and are unable to enjoy agglomeration economies. Whereas, the industrial complex or ‘production combination’ as called by socialist writer Kolosovskiy is a major progressive form of modern organization in industry. Under this form a single major production enterprise covers a variety of lines of production. The waste or products of one type of enterprise serve as the raw materials for the intermediate products or auxiliary materials for others. The branches of production are organically, technologically and economically linked in a single production complex. Therefore, complex means not just one firm, one branch of industry in one factory, but a totality of economic relations, a totality of economic exchange, even if only in small locality (Peter, N. - 1972; Planning of Industrial Complexes by Geometric Programming, p.8).

1.1.8. GROWTH OF INDUSTRIAL COMPLEX

The growth and establishment of an industrial complex at a particular location is the outcome of the interaction of varied physical, economic and social factors. When and where the causation factors exceed in favour of one major industrial activity industrial concentration takes place. Since, these factors are not ubiquitous, the industrial concentration presents uneven trend having a distinct cultural landscape. They are known as industrial districts, regions and belts.

The modern industrial regions of the world have developed, firstly, where coal, petroleum and hydro-electric-power are available in abundance. Secondly, where exploitation of raw material is done.

Thirdly, in or near large centres of population, where cheap labour and good markets of consumers are available, fourthly, at trading centres and Port cities, in order to gain labour, materials and wider markets of national and international extent and finally advanced technology, huge capital supply and also due to the welfare schemes of the socialistic governments. Development of Industrial Complexes depends upon different factors like, coal fields, raw materials, population agglomeration, port cities; advance technology, government’s welfare schemes etc.
I. Industrial Complex near Coal Fields

Development of industrial belt influences the process of urbanization and modernization. Many times, industrial belt develop as urban centres. Before the Industrial Revolution of the 18th century, power was basically derived from running water, wind mills and wood, the output of these power resources was small, transport system was not well developed and accessibility to markets was limited. Thus, small industries were set up wherever availability of favourable conditions and they also did not require a large labour force. Mostly small industries could be operated at any place which had a swift stream or wood supply.

The invention of steam engine in ending of 18th century and the development of a process for making metallurgical coke from coal in the 19th century changed the whole scenario and ushered the world into the age of industrial development. Coal gave new direction to industries. Coal gave industries greater power supplies and thus large quantity of coal was required for almost each and every industrial activity. In the early days, the fuel efficiency of coal was poor; around 12 tonnes of coal was required to smelt 1 tonne of iron ore. Therefore, the poor transportation conditions of the times, it was difficult to transport the heavy and bulky coal to long distances.

Thus, coal fields became the new site for the growth of industrial districts and the first industries to be attracted towards the coal fields was the iron and steel industry, as large amount of coal was needed in it both as source of power and raw material. Other industries also slowly tend to move towards the supplies of steel and coal. This led to a rapid migration of people in large numbers to the industrial areas as well as coal field areas in search of employment opportunities.

Thus, the development of industrialization played an important role in the coal mining and urbanization process of the world. Example of iron and steel industry at Rurh Basin, Appalachian Region, Damodar Basin etc. signify to the importance of coal for the location of industries.

II. Industrial Complex near Raw Materials

The dairy industry, food processing industries, the sugar industry, the cement industry, the copper smelting and lumbering and several other industries are located nearer at the centres
of their respective raw materials. These are bulky and perishable raw materials and invoice the heavy weight of waste material in proportion to the finished products. Hence, the production-economies are profitable and gained through location near raw materials sites.

III.) Industrial Complex near Population Agglomerations

Large urban centers provide a variety of sources for markets and labours. Therefore, different types of additional industries are attracted on account of infrastructures and other services available.

Thus, the development of Industrial Complex depends upon the different factors. And these factors develop industrialization and urbanization in industrial complexes. Several industrial and mining towns were developed. Major industrial towns located in this region.

1.2 REVIEW OF LITERATURE

During the last few decades a large number of literature have appeared on different aspects of Urbanization as well as Industrialization, impact of Industrialization and Urbanization on urban process, Urbanization vs. Environmental Degradation etc. The scholars of industrial/urban/environmental geography lay emphasis on the role of industries in the process of economic, development of their locational aspects and their impact on population and physical resources. The link between industrialization and urbanization is an important one and it has attracted the attention of geographers. Various geographers have studied these phenomena separately and various geographers have tried to analyze their relationship with each other.

Smailes A.E. (1953) had traced the development of urban areas from the earliest sites to modern megalopolis and strip cities and also discussed the classification and ranking, location and types, origin, course of development of the city and the relationship of the city to its region and nation.

Taylor G. (1961) had analyzed the topographic and other controls on the growth of towns and also traced the evolution of Primitive Asiatic towns, Greek towns, Roman towns, Early Medieval towns and modern towns.
United Nations Report (1963) had described “Industrialization is regarded as an urgent part of the wider process of economic development especially in those countries in which relationship among factors of production make for under-employment and low productivity in the agricultural sector of the economy.” Joy Mount (1963) had mentioned the three motives behind industrialization, firstly to raise the standard of living by increasing the Per-Capita National Income, secondly, it is a means to absorb surplus agricultural population and thirdly, it also improves the balance of payment situation.”

Ranis and Fei (1964) had mentioned that the index of the rate of economic development of an under-developed country is provided by the extent to which there is a net transference of labour from agricultural sector to the industrial sectors.

Mukherjee Mahamaya (1967) had made a study of manufacturing towns of Bihar.

Ram L.N (1968) had distinguished the industrial belts in South-East Chota Nagpur. In this paper he remarked that the region had a very high industrial potential on account of the rich mineral resource base and a rapidly growing demand due to increasing urbanization. Dayal P. (1968) studied the role of geographical factors on the location of iron and steel industry in India.

Mookharjee Debnath (1969) had studied the pattern of urbanization in India, 1951-1961. Kollman Wolfgang (1969) had studied and analyzed the process of urbanization in Germany at the height of the industrialization period.

Pandey Pradyumna (1970) had studied the impact of industrialization on urban growth in the Chota Nagpur region.

Lall A. and Thirtha R. (1971) had discussed the spatial analysis of urbanization in India and made a special reference to the urbanization process of the mining and industrial belt of Damodar Valley.

Gauntia R. (1978) had discussed the spatial distribution of manufacturing in the Chota Nagpur plateau and also assessed the impact of industrialization on the trend of urbanization of the region.


Chib S.S. (1984) has presented an overview of industrialization and urban growth in India. This paper positively links the urbanization to the growth of industries.

Woodeyar and Gundi (1985) have analysed the impact of industrial development on population with special reference to the twin industrial towns of Davangere and Harihur of Chitradurga District in Karnataka. Gwyne R.N. (1985) has mention the links between modern industrialization and urbanization in Latin America and has accepted industrialization as the most powerful economic force behind the tremendous expansion of Latin America cities in recent years.

Prasad Maheshwari (1986) has analyzed a study of the morphological and landuse characteristics of mining towns.

Jagannathan N.Vijay (1987) has described the role of availability of mineral resource, their subsequent exploitation and resultant industrial development in the growth of Durgapur.

Gilewska S. (1988) has analyzed the changes in the geographical environment brought about by industrialization and urbanization.

Ramachandran, R. (1989) has discussed the history of urbanization, its processes and definitions of urban places in India. This paper also described the present pattern of urbanization and the urbanization policy of India.

Reddy (1991) had contributed a paper on impact of urbanization and industrialization on migration.

Chaudhari A.B. (1992) had discussed the environmental degradation caused by coal mining with reference to the major coal fields of India, viz. Ranigunj coalfield and Singrauli coal field. Young J.E. (1992) has described the role of growing mineral extraction in environmental degradation of developing countries. Nigar Anjum (1992) has analyzed the impact of industrialization on water pollution.

Thakur and Parai Anindita (1993) have analyzed the changing nature of the growing specialized trends of urban geography in India since Independence with particular emphasis to the 1980’s and early 1990’s. Sengupta M. (1993) had reviewed some of the most significant environmental problems associated with mining and has presented an agenda for minimizing
environmental damage and offered solution for the restoration and remediation of degraded areas.

**Tiwary and Dhar (1994)** have made a study of the environmental pollution of Damodar River caused due to coal mining activities in the Damodar Valley.

**Basu S. (1996)** had discussed the history of urbanization in the Lower Damodar Valley region with special reference to coal mining and has stated urbanization is closely related to industrialization. **Winterhalder Keith (1996)** has discussed the environmental degradation problem around Sudbury, a major mining and smelting area and this paper also suggested rehabilitation measures for the landscape of the area.

**Sinha V.N.P, Shankar Urvija and Sinha S.P. (1997)** had discussed the role of mineral resources in the development of industrial regions and growth of urban population in Chota Nagpur region. **Kumar Parmanad (1997)** has presented a brief description of the growth of Urbanization in India. **Jackson J.H. (1997)** has analyzed the role of expansion of coal mining in the process of urbanization of Ruhr Valley. **Dudka and Adriana (1997)** have discussed the impact of mining and smelting of metal ores on environmental quality.

**Mishra R.P. (1998)** has monitored the evolution of Indian urban systems through the course of history. He has also discussed the contemporary urban growth dynamics in India and has also suggested methods to make the cities sustainable.

**Hussain Majid (1999)** has studied the rapid increase of urban population to industrial revolution. **Singh Savindra (1999)** has described the role of mining, industrialization and urbanization in environmental degradation.

**Saxena H.M. (1999)** has discussed the role of mining in environmental degradation. **Afzal (1999)** has studied the man-environment interaction and sustainable development.

**Roy B.K. (2000)** has studied a hundred year overview of Indian urbanization and resulting urban landscape in the country at macro level. **Handley, Paulier and Gill (2000)** have investigated the situation of landscape of coal mining towns of Lancashire and also suggested some measures for its sustainability.

**Sharma V.K. (2002)** has discussed the chronological analysis of evolution and development of industries and its prospective trends in Madhya Pradesh. **George C.S. Lin and Samuel P.S. Ho (2003)** have studied the gain in both land area and growth rate experienced by industrial mining sites in East China, where industrialization and urbanization have grown. **M. P.**
Gupta and S. Sharma (2003) have considered the role of coal resource in the industrialization and subsequent urbanization of Korba and have regarded it as a major factor that has attracted immigrants to the city. Edit Eva Kiss (2003) has discussed the major characteristics of Hungarian industrial parks and the links between them and has evaluated their role in regional economic development. Bade K. J and Brown A. (2003) have studied the migration of labourers to the centres of coal mining in Rhur Valley. Prasad Ashok (2003) has studied the facets of urbanization in Bihar. Dayal P. (2004) has analysed the trends and challenges of world urbanization.

Panchamukhi P.R. (2005) has presented a broad view about the trends of urbanization in India, its implications and challenges and has attempted to present the salient components of the approach to manage the challenges related to urbanization. Singh Y, Sawhney U. and Nayyar Indu (2005) have discussed the industrial development and growth of Ludhiana, Punjab’s primary industrial city with particular reference to the period from 1971 to 2001. They have denoted that rapid growth rate of industrialization in Ludhiana has resulted in a much faster rate of population growth, than any other city in North-west India, due to migration of industrial labour.

Mohammad Naqi (2005) has considered the problem of siltation in reservoirs of Damodar Valley Corporation caused due to coarse sediments released by mining operations in Damodar Valley coal fields.

Verma V.S. (2006) has described the past and present trends and status of urbanization in Jharkhand. Banerjee Anuradha (2006) has discussed the urban challenges in 21st century India and has analysed the impact of urbanization on environment. Datta. Pranati (2006) conducted a study on “Urbanisation in India”. This paper endeavours to illuminate on the process of urbanization in India over a century with emphasis on level tempo of urbanization and urban morphology using Indian census data during 1901-01. It will try to trace urban problems and related policy issues. The result of the study indicates that the urbanization is occurring not due to urban pull but due to rural push. Globalization, liberalization, privatizations are addressing negative process for urbanization in India.

Aijaz. Rumi, (2006) conducted a study on “Challenges for Urban local governments in India”. The paper studies urban local government institutions/municipalities are constituted for the maintenance and urban areas is miserable and the citizens lead a difficult life. To overcome
this problem, a series of reforms have been initiated by the Indian government to strengthen local-level governance. The main purpose of this working paper is to describe the major issues of governance at the local level and to identify some important challenges for urban local government institutions in India in the light of recent urban sector reforms. This assessment is based on data collected from six urban centres situated in three northern/north-western states (namely Haryana, Rajasthan and Uttaranchal) of India on Key urban local government characteristics-constitution and governance, duties, composition, management and finance practices, state/local-level initiatives and problems. The findings of this study show that urban local governments in India continue to remain plagued by numerous problems, which affect their performance in the efficient discharge of their duties.

Sarkar B. C, Mahanta B.N. Paul P.R. and Singh Gurdeep (2007) have discussed the geo-environmental quality assessment in Jharia coal field using multivariate statistics and G.I.S. Ghose M. and Majee S. (2007) conducted an investigation to evaluate the characteristics of the air borne dust created by surface coal mining in Jharia coal field. Pratap Rana (2007) has discussed the urbanization status and scenario of Bihar and Jharkhand in comparison to India.

Rai. Anil, (2010) conducted a study on “Urban India: Issues and Challenges.” This paper studies key issues and challenges of urbanization in India, holistically and argues that urban development needs to recognize the vast potential of cities with pro-active reform and appropriate policy directions. Bagga. Urmila, (2010) conducted a study on “Urban India moving towards reforms pathway”. The paper presents situational analysis relating to the performance and progress of state governments and mission cities relating to implementation of reform agenda.

Various steps taken up by the GOI for handholding the slow performing cities/states as well as the operational challenges and existing issues under JNNURM have also been presented in the article. Sharma Kumar Pawan, (2010) conducted a study on “A Core Swallows the periphery Zone”. The paper of tests the efficacy of Chandigarh Periphery Control Act 1952, amended in 1962, which was meant to retain the overwhelmingly rural character of the tract up to 16 kilometers from the project site of the city. The intention was to provide a green envelope to the city of Chandigarh and protect it from unsavory appearance of an urban sprawl. Analysis here is based on the perusal of government documents and relevant literature, processing of the secondary data for the years 1951-2001, extensive field observations and discussions with the
stakeholders. Findings show that the intended rural character of the Periphery Zone could not be conserved; it has gradually been turned into an expending modern urban sprawl. In the context of the emerging scenario it may be worthwhile to go in for a new Periphery Zone around the extended urban conglomerate of Chandigarh, S.A.S. Nagar and Panchkula. The presentperiphery has already become a part of the core through the spatial diffusion of the urbanization process.

Prasad. Meenakshi, (2011) conducted a study on “Urban Challenges of Dhanbad”. The paper attempts to assess the urban challenges of Dhanbad and suggests some measures to meet these challenges. The paper is based on empirical observations and detailed micro level field survey conducted by the researcher with the help of questionnaire. Secondary data and relevant information were obtained from M.A.D.A. (Mineral Area Development Authority) Dhanbad and Dhanbad Municipal Corporation, Dhanbad. Findings show that the city faces lotys of urban challenges but fortunately Dhanbad has been identified under ‘Jawaharlal Nehru Urban Renewal Misson’. It is expected that under the instruction of JNNURM the urban challenges of Dhanbad will be successfully met with and the conditions of the city will improve in near future. Kumar Virendra, (2011) conducted a study on “Trends of urbanization in Bokaro District Jharkhand”. The paper studies the trends of urbanization in Bokaro District. The paper is based on the secondary sources only. Findings show that the trends of urbanization in Bokaro district started in 1941. During 1971-81, 1981-91 and 91-01 the urban population grew by the rate of 86.67, 47.00 and 24.00% respectively. In 1971, 31.02% persons of Bokaro district lived in the urban areas, now it increased to 45.31% in 2001. Trends of urbanization increased in Bokaro district because it is situated in between coal and iron ore belt and other favourable conditions are also available for establishment of Iron and Steel Industry. It become ‘Iron and Steel’ capital of India in near future. It is one of the districts in Jharkhand where urbanization grew with a high rate in a short period and expected to go for higher growth rate of urbanization in near future. Bhagat (2011) discussed that the declining trend in the urban population growth rate observed during 1980s and 1990s reversed at the national level, and the rate of urbanization increased at a faster pace during 2001–2011. However, the contribution of natural increase in urban growth during 2001-2011 has declined in terms of proportions over time.

Asaaied Seba, (2012) conducted a study on “Dealing with Urban Growth in Damascus, Syria: Challenges and Recommendation. This paper will examine the role of the local government in dealing with the challenges of rapid urban growth and uncontrolled urbanization
in the city of Damascus, Syria. It will take the management of open space as case study for the urban governance in Damascus. Open space in Damascus suffers from decline and degradation and often is observed as neglected and poorly maintained. Moreover, the metropolitan growth of Damascus took place at the expense of the green area. “At-Ghouta” which was an important agricultural land and learning source for many villages. The paper will show how open space is managed in the city of Damascus, by underlining the legal framework, governance processes and the applied planning system. In the second part, recent governmental actions and their effects on the city development will be analyzed and evaluated. Finally, new policies and strategies to improve urban governance performance will be suggested.

Tripathi (2013) tried to study a positive link exists between urban agglomeration and economic growth in India. Despite data constraints, the paper considering 59 large agglomerations and applying the recursive econometrics model, found a strong positive relationship between urban agglomeration and economic growth in India. Table 3 describes the major agglomeration studies in details by giving objectives of the different studies, estimation models, major data used, and main findings of the study.

Mundhe and Jaybhaye (2014) analyzed that the trends and patterns of urbanization in Maharashtra for the decade 1991–2011. The authors describe urbanization within Maharashtra as very lopsided. Western Maharashtra is more urbanized than some extreme parts of Vidharbha and Marathwada which regions have the lowest level of urbanization in the state due to lack of industrialization.

Tripathi (2015), presented a paper on the recent trends and patterns of India’s urbanization and urban economic growth finds evidence of rapid urbanization in India in terms of number of cities/towns, urban population size, urban area and urban population growth rate. Kadi and Nelavigi (2015) tried to analyze the trends of growth of urbanization in India Urbanization, population growth, metropolitan cities and tempo of urbanization. Data on urban population, Towns and cities, variation rate of urban agglomeration, average annual exponential growth rate. Data sources are Census of India of various years. Cities in India become very populated and over crowded as result of increase in population over the decades and partially account of migration. Thongkhant hang P. (2015) tried to analyze the growth pattern of towns and cities in the north-east region of India. Exponential models, Composite index Level and growth of urbanization, Town directory 1981, 1991, 2001, 2011. Major Finding of this study is:
Availability of urban amenities such as good electrification, medical facility, recreation, cultural facility play significant role in attracting people to migrate to urban centers that lead to increasing dominance of class-I cities.

Tripathi and Mahey (2016) tried to analyze the impact of urbanization on economic growth in Punjab. Ordinary Least Square model Data on number of towns, share of urban population Town directory, 2011. The present study brings out the positive link between urbanization and economic growth in Punjab.

Sharma Sheeta (2017) tried to find out the effects of urbanization on water resources-facts and figures. The present paper is an attempt to correlate and identify the periodical changes in Urban Hydrology, during urbanization of Bhopal City, India during last twenty years and above with the help of GIS mapping and statistical analysis of related built-up areas. Major findings show an interesting relation of geology, land use, land cover and water table, which can be used for further research and sustainable development.

1.3 ANALYTICAL FRAMEWORK

1.3.1 SIGNIFICANCE OF PRESENT RESEARCH WORK

The study of industrial geography incorporates the study of regional planning in a backward economy. Regional planning of socio-economic attributes from grass-root level or micro level is the urgent need for developing countries like India. Some aspects, which invite research attention area, are:-

a) Industrialization plays a great role in the development of backward regions.

b) Growth of industries helps the socio-economic betterment of that region.

c) Industrialization through industrial complexes.

d) Industrial planning helps growth and transformation of backward region into planned region.

e) Industrial linkage is the important factor for the growth of industrialization.

The role of industrialization in the regional development is a relevant aspect of research studies. First and second Five Year Plans and Development Visions focused on industrialization in India. Regional development is the main objective of our Five Year Plans. Industrial complexes provide better conditions through the mobilization of the resources, erecting employment opportunities and achieving at the better productions, all these are meant for better socio-economic changes of that region. In a backward economy the goal of economic and social
well being can be achieved at micro or regional level through the diversification of economy from agricultural to non-agricultural sector. Urban growth in India has become more faster from 1951 onwards due to industrialization.

Industrial complexes develop around a nucleus plant. Such plants act as a mother plant and nourish several other large, medium and small scale industries. These industries are related to various other industries on the regional plane and thus industrialization is achieved. The process of industrialization has become a symbol of development in the modern era.

The industrial planning is always sought to decentralize the industrial activities to several new centers. These centres when functionally inter linked to one another become more operative. But when these centres become nodes, they accumulate huge wealth and survive at the cost of peripheries and accentuate regional disparities.

Industrial Complexes are, however inherently opposite to the industrial nodes and therefore, industrial planning is truly conditioned to industrial complexes. The process of industrialization generally provide a large number of services and urban centers, therefore, it attract a large number of populations to immigrate to urban places in search of livelihood and betterment of socio-economic conditions.

The proposed study will take into account Bokaro Steel City as its study area and also analyze the challenges in the study area. Bokaro Steel City was initially a planned township for the working population of Bokaro Steel Plant. At present Bokaro Steel City is facing several problems related to urban landuse, morphology as well as environmental degradation. New unplanned growth of urban settlements along the periphery has also lead to several problems. The old areas of the city are in need of urban renovation and renewal. Growth of new settlements is largely unplanned and haphazard. There is lack of proper drainage, water supply, sewerage and solid waste disposal facility etc. These urban challenges are hampering the proper urban functioning of the study area.

Trends in the growth of urban population in the city reveals that the lead to over-crowding, congestion, encroachment, problems of open space and housing, squatters’ settlements and overall degradation of urban environment due to excess population process. Lack of opportunities for gainful employments in villages and the ecological stress is leading to an ever increasing movement of poor families to towns. Cities are emerging and urban slums are expanding. In Bokaro Steel City squatters’ settlement is one of the hazardous problem because
squatters’ settlement in and around the city not only hamper beauty of the area, at the same time it is unhygienic and creates several problem like illiteracy, unemployment, disease, crime, polluted environment etc.

Environmental degradation and sustainable development has now emerged as an aspect of global concern. It is a result of the dynamic inter-play of socio-economic, cultural, institutional and technological activities. Scientists across the world wide have realized the symptoms of depletion and decline in the functioning of the physical components of the environment. Rapid urbanization and industrialization has caused wide spread environmental degradation in Bokaro Steel City.

In this context the present study attempts to analyze the urban challenges of Bokaro Steel City and also suggests some measures to meet these challenges.

1.3.2 OBJECTIVE OF THE STUDY

Bokaro Steel City came on the industrial map of India as an important industrial belt since 1964. The present work was an attempted to study and analyzed the “Urban Growth and Challenges of an Industrial City: A Case Study of Bokaro Steel City.” The objective of the present research work is:

- To identify the problems related to population growth and changes in physical, environmental, urban morphology and suggest some solutions for the same.

1.3.3 HYPOTHESIS OF THE STUDY

The present research work was based on the hypothesis that the process of industrialization in any region leads to boost urbanization as well as socio-economic transformation of rural to urban population in its zone of influence. In context of present research work it could be said that the establishment of large and heavy steel plant i.e. Bokaro Steel Plant at Bokaro district has led to further industrialization in this region through the establishment of a large number of small scale industries. The process and development of industrialization as well as trade and commerce leading to large scale immigration of people in Bokaro Steel City, ultimately resulting in the rapid urbanization of the township. The process of urbanization has
led to marked changes in the overall demographic, socio-economic and cultural aspects of population living in the study area. This hypothesis was tested in the preceding chapters.

STATEMENT OF PROBLEM

The hypothesis was presented in the form of statement of problems which are as follows:

- Original layout of the planned town has changed from point view of urban morphology.
- Public utility services are not coping with the growing population.
- Unchecked urban growth experiences within and peripheral areas of the Bokaro Steel City.
- Environmental degradation has taken place.

1.3.4 DELIMITATION OF THE STUDY

- The research is confined only in Bokaro Steel City.
- The study has conducted to assess the urban challenges of a planned town: Bokaro Steel City which might have some generalization.
- The sample size is limited to 978 respondents. 636 respondents from residential area and 342 respondents from squatters’ settlement of Boaro Steel City.

1.3.5 METHODOLOGY

For the completion of any research work it is important to follow appropriate, rational and practical methodology. A research work needs some necessary steps.

- **Design of the Study:** - The present study was an empirical observations and detailed micro level survey type study.

- **No. of respondents:** - 978 respondents of B. S. City were interrogated for obtaining relevant information.

- **Sampling Method:** - The purposive random sampling was used for the selection of the sample.

- **Tools and Techniques:** - The following tools and techniques were used to collect data for the study:-
  - Questionnaire
Interview Schedule
Observation Schedule
Data for the study was collected from the secondary as well as primary sources.
Data was compiled, computed and analyzed according to research methodology.
Suitable maps and diagrams were incorporated to make the analysis more illustrative.
Data analyzed with the help of statistical methods like percentages, correlation, regression, ANOVA (F-ratio test), Chi Square test and Kendall’s Method.

(a) Selection of Study Area
For the purpose of present research work the scholar has selected Bokaro Steel City as the study area. Bokaro Steel City is a planned city for the working population of Bokaro Steel Plant. It has been mentioned that the present study aims at finding out solution of urban growth and challenges of B. S. City. At present B. S. City is facing several problems related to urban landuse, morphology as well as environment degradation. Growth of squatters’ settlements is largely unplanned and haphazard. These urban challenges are hampering the proper urban functioning of the study area.

This requires a detailed analysis of phenomena which must have a base of works by different disciplines. But the study area has very limited previous literature. Therefore, the researcher has only option to do her best at her own, basing upon the limited resources already available i.e. the general plan and her own intensive field study. Therefore, the researcher has selected this area for the purpose of research work.

(b) Sources of Data and Information
For the purpose of present research work, the researcher has obtained data both from primary as well as secondary sources. In case of this study the main source of information is field work. Bokaro Steel City is a single industry based city and easily assessable in size. Moreover, the researcher living in this city makes field work easier specially for rechecking and clearing doubts by repeated visits.

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“Any study involves three principal processes: observation, recording and interpretation” (Sahu, S. D. 1997, p.60). Observation and recording were done in the field with map and printed questionnaires.

The general map of Bokaro Steel City was collected from City Planning and Architecture Department. The questionnaires have been printed after considering all urban challenges and socio-economical aspects. All points may not be delt with help to give related ideas. Hence, the primary data were collected and obtained from the questionnaires.

City planning and Architecture Department, Township Department, Horticulture Department, Design Bureau, Department of Peripheral Development helped by providing information’s, reports, books, data, maps etc.

The census report, Geological Survey of India, Geomorphological Survey of India helped the researcher to know the geographical background of the area with maps.

The author collected various books on relative topics from Bokaro Library, Central Library of Patna University, A. N. Sinha Library, Sinha Library, Central Library of Vinoba Bhave University etc. General newspapers and magazines helped by giving information about the trend of urban growth and urban challenges all over the world. Geographical magazines like Annals, Geographical Review, Indian Journal of Landscape Systems and Ecological Studies, Journal of Indian Geographical Foundation etc. gave various informations and helped in brushing up author’s knowledge.

To have first hand information regarding the location, functioning and present status of industries the scholar has personally visited almost all the industrial units in the study area and gathered relevant data and information through questionnaires. Besides a lot of information have been obtained from Nagar Seva Bhawan and Administrative (A.D.M.) Building of Bokaro Steel Limited. The author had extracted numerous data for the topographical maps to facilitate maximum accuracy and cross checking to find out geographical background of the area.

Researcher also knocked at the doors to officials and organizations for collecting data specially to know about morphology of the city. But exclusive data on the urban challenges were collected only by intensive field study with questionnaires and empirical observations. Thus, the present study is a complex attempt involving two most vital aspects of formality and functionality. Both these aspects are complementary to each other.
It was not possible to study the urban challenges and environmental characteristics of this vast population at micro-level. Hence, a sample of about 636 households of urban population of residential areas and 342 households from squatters’ settlements were selected. From each household one respondent were selected. Residential areas of Bokaro Steel City were divided into three categories i.e. HIG, MIG and LIG.

**TABLE NO. – 1.1**
Projected Population of Residential Areas of Bokaro Steel City
Number of Families surveyed in June 2016

<table>
<thead>
<tr>
<th>Quarter Type</th>
<th>Total no. of household</th>
<th>No. of Surveyed household</th>
<th>No. of Projected Family Members</th>
<th>Projected Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIG (A&amp;B)</td>
<td>26+528=554</td>
<td>44</td>
<td>5.0</td>
<td>224</td>
</tr>
<tr>
<td>MIG (C&amp;D)</td>
<td>4002+7650=11652</td>
<td>245</td>
<td>6.2</td>
<td>1519</td>
</tr>
<tr>
<td>LIG (E&amp;EF)</td>
<td>24596</td>
<td>347</td>
<td>7.0</td>
<td>2426</td>
</tr>
<tr>
<td>Total</td>
<td>36802</td>
<td>636</td>
<td></td>
<td>4172</td>
</tr>
</tbody>
</table>

**TABLE NO. – 1.2**
Projected Population of Squatters’ Settlements of Bokaro Steel City
Number of Families surveyed in June 2016

<table>
<thead>
<tr>
<th>Location of Squatters’ Settlement</th>
<th>Total no. of household</th>
<th>No. of Surveyed household</th>
<th>No. of Projected Family Members</th>
<th>Projected Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>5424</td>
<td>342</td>
<td>7.0</td>
<td>2394</td>
</tr>
</tbody>
</table>
### TABLE NO. – 1.3

Selection of Respondents from Residential Areas of Bokaro Steel City

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>B. S. L. Quarters</th>
<th>No. of Households (Types of Quarters)</th>
<th>No. of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>HIG (A+B)</td>
<td>MIG (C&amp;D)</td>
</tr>
<tr>
<td>1</td>
<td>Sect I &amp; Camp II</td>
<td>16</td>
<td>20</td>
</tr>
<tr>
<td>2</td>
<td>Sec II</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>Sect III</td>
<td>-</td>
<td>32</td>
</tr>
<tr>
<td>4</td>
<td>Sect IV</td>
<td>14</td>
<td>76</td>
</tr>
<tr>
<td>5</td>
<td>Sect V</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>6</td>
<td>Sect VI</td>
<td>-</td>
<td>23</td>
</tr>
<tr>
<td>7</td>
<td>Sect VIII</td>
<td>-</td>
<td>8</td>
</tr>
<tr>
<td>8</td>
<td>Sect IX</td>
<td>-</td>
<td>20</td>
</tr>
<tr>
<td>9</td>
<td>Sect XI</td>
<td>-</td>
<td>5</td>
</tr>
<tr>
<td>10</td>
<td>Sect XII</td>
<td>-</td>
<td>40</td>
</tr>
<tr>
<td>11</td>
<td>Wn. Suburb</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>12</td>
<td>Co-operative Colony</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>44</td>
<td>245</td>
</tr>
</tbody>
</table>

### TABLE NO. – 1.4

Selection of Respondents from Squatters’ Settlements of Bokaro Steel City

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Location of Squatters’ Settlements</th>
<th>Total No. of Households</th>
<th>No. of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sect I</td>
<td>711</td>
<td>30</td>
</tr>
<tr>
<td>2</td>
<td>Sect II</td>
<td>76</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>Sect III</td>
<td>189</td>
<td>16</td>
</tr>
<tr>
<td>4</td>
<td>Sect IV</td>
<td>498</td>
<td>28</td>
</tr>
<tr>
<td>5</td>
<td>Sect V</td>
<td>162</td>
<td>15</td>
</tr>
<tr>
<td>6</td>
<td>Sect VI</td>
<td>148</td>
<td>12</td>
</tr>
<tr>
<td>7</td>
<td>Sect VIII</td>
<td>156</td>
<td>16</td>
</tr>
<tr>
<td>8</td>
<td>Sect IX</td>
<td>257</td>
<td>22</td>
</tr>
</tbody>
</table>
“Field studies play a vital role in nearly all investigation (Prasad, N. 1979, p23)”. The author, therefore, carried out a detailed field work during 2015 and 2016 in her study area reaching by car or motorcycle at the spot and then moving on foot. This study involved keen observation, skillful recording of information’s for which the author needed following things.

i.) Questionnaires.

ii.) Outline maps of the field with sectors and roads, field-sketch diary, pencil, pen, chalk.

iii.) Camera and other essential things of personal field use.

Data concerning social-cultural characteristics such as family structure, level of income, employment structure, marital status, and place of origin of migrants, pattern of socialization, availability of public amenities, quality of life, environmental aspects and other problems were gathered through questionnaires. Observation, sample study, information discussion etc. have to be employed for gathering different types of data and information. The secondary data used in the present study includes the Reports of Census of India and other Government and non-government reports etc. these helped in finding out the growth, density and distribution of population, level of urbanization, literacy, religion, caste and age-sex structure etc.

(c) Data Analysis

In the present research work, for the purpose of data analysis both statistical and non-statistical methods have been used. Most of the data have been analyzed by suitable statistical methods. It is significant to note that for major portion of the work population data were divided into two groups i.e. 636 respondents from Residential areas of Bokaro Steel City and 342 respondents from Squatters’ settlements of Bokaro Steel City. 120 respondents from Peripheral
areas of Bokaro Steel City were not used in sample data but they were used during to prove the third hypotheses i.e. “Peripheral areas experience unchecked urban growth”.

Further calculations and analysis of data concerning inter censual growth of population, age-sex structure, literacy, occupational structure and other relevant data and suitable methods have been adopted. The data regarding level of education, level of income, size of family, type of family, availability of public utility services or civic amenities etc. were analyzed by tabulation and computation of field survey work with non-statistical methods and suitable statistical techniques or methods like percentage, standard deviation, Karl Pearson’s correlation coefficient, line of regression, ANOVA (F-ratio test), Kendall’s Rank method, Chi square test etc. Kendall’s Rank method was also used by Ashok Mitra for measuring different levels of development in India.

(d) Sources of Map

For the present research work, the base map of Bokaro Steel City has been obtained from Architecture and City Planning Department of Bokaro Steel Limited and prepared by the Survey of India for D.V.C. on which Bokaro General Plan was made. The author at first procured the relatively large scale topographical map of the city on 1:20,000 scales from Architecture and City Planning Department of Bokaro Steel Limited and prepared by the Survey of India for D.V.C. on which Bokaro General Plan was made. This was the basic map relating to relief, surface elevation, drainage, slope, city lay out and infrastructure development.

The following maps have been taken for the preparation of maps in present research work, they are:

i.) Topographical Map 73 I/2 with 1: 50,000
ii.) Topographical Map 73 I/2 with 1: 20,000
iii.) Geological Quadrangle Map 73 I
iv.) ARC GIS and Remote Sensing

With the help of the above maps and on the basis of data collection, compilation, tabulation and analysis a number of maps and diagrams have been drawn by applying suitable cartographic techniques viz. line graph, bar graph, pie diagram etc. The researcher on the basis of
intensive fieldwork has drawn maps of sector wise distribution, major and important roads, exact location of squatters’ settlements.

1.4 IDENTIFICATION OF THE STUDY AREA

The study area “Bokaro Steel City” is the administrative headquarters of Bokaro District. Bokaro District is one of 22 districts of Jharkhand state. Bokaro Steel City lies between 23°40’ N to 23°67’N latitude and between 86°09’E to 86° 15’E longitude. The City is bounded on the east by Dhanbad and Purulia, on the west by Ramgarh and Hazaribag, on the north by Giridih and on the south by Ranchi. The city stands at an elevation of 210 meters (690 feet) above sea level and has an area of 183 square kilometers (71 square miles).

Formerly there was a village named ‘Maraphari’ deep in the jungles of Chotanagpur. The closest village was ‘Chas’ and ‘Purulia’ was the closest town and the area was ruled by the ‘Maharaja of Kashipur’.

The site of present Bokaro Steel City was once a remote area. It was the vision and subsequent planning of Pt. Jawaharlal Nehru that paved way for the transformation of this place. Pt. Nehru planned to build the first swadeshi steel plant with the help of the Soviet Union. The proximity to coal, iron ore, manganese and other raw materials helped in the selection of this site for major steel plant in India. As the fourth integrated steel plant in the public sector, Bokaro Steel City was conceived in 1959 and Bokaro Steel Plant actually flourished in 1965. It was incorporated as a limited (BSL). With the Bokaro Steel Company, the area was gradually converted into a township within a span of three decades.

Bokaro Steel Project is the fourth and the largest integrated single industry-based complex in the country. The residential complex of the steel plant, known as Bokaro Steel City (B. S. City), located in the east of the plant area.

Bokaro Steel Project is divided into three main parts: -
1. The Plant,
2. The Township and
3. The Garga Dam and Reservoir.

It is bounded by the Damodar River in the north, the Garga River, one of the Damodar’s tributaries in the east and the south, and by South-Eastern Railway line in the West (Fig. - 2.2 in
Chapter-2). Bokaro Steel City is about 50 km from Dhanbad, which is on the main Delhi-Howrah railway line. It is equidistant from Ranchi and Jamshedpur. The distance is being about 136 km. the city has direct rail links with Delhi, Howrah, Chennai, Patna etc. The National Highway No. 32 runs along Chas, only 2 km. away from Bokaro Steel City and meets Grand Trunk Road via Dhanbad. Bokaro Steel City is on Dhanbad-Ramgarh Road, which is the National Highway No. 23.

Previously Bokaro Steel City was located in Dhanbad district, but due to increasing importance of Bokaro Steel Project, in 1991 a separate district named Bokaro was formed with eight blocks, keeping Bokaro Steel Project almost in the centre. Eight Blocks are Bero, Gomia, Nawadih, Petarbar, Kasmar, Jaridih, Chas and Chandankyari. Now, Bokaro has become an important district in Jharkhand with Bokaro Steel City. According to 2011 census, Bokaro Steel City was the 86th largest urban agglomeration and fourth largest city in Jharkhand.

The people of Jharkhand are influenced by Dravidian culture. Paleolithic imprints in Jharia, a place in Jharkhand (erstwhile in South Bihar) indicate the existence of human in the Paleolithic Age i.e. 200,000 – 20,000 B. C. (Ahmad, p 209, 1965). The traces of Neolithic culture are quite prominent at various localities in Chotanagpur plateau region which consists major part of the Jharkhand.

According to census of India 2011, Bokaro Sterel City has a population of 4,14,820 in India. Male population constitutes 54% of the total population and females 46%. Bokaro Steel City has an average literacy rate of 83.47% which is much higher than the national average of 59.5% with male literacy of 90.58% and female literacy of 75.47%. It is one of the most populous cities in the state of Jharkhand. The city has always been multiethnic and cosmopolitan with resident from every state of India as well as abroad. Bokaro Steel City recorded 100% urban population and fourth most urbanized city of Jharkhand state after Purbi Singhbhum, Dhanbad and Ranchi.
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