REGIONAL DISPARITIES IN SOCIO-ECONOMIC DEVELOPMENT IN WEST BENGAL

ABSTRACT

THESIS
SUBMITTED FOR THE AWARD OF THE DEGREE OF
Doctor of Philosophy
IN
GEOGRAPHY

BY
MD. SHAMIM

UNDER THE SUPERVISION OF
Prof. Azimuddin Qureshi

DEPARTMENT OF GEOGRAPHY
ALIGARH MUSLIM UNIVERSITY
ALIGARH (INDIA)
2002
ABSTRACT

One of the serious problems that India is facing today is the problem of regional disparities. It results in social, economic and political instability. The current tension and strain in the Indian polity are essentially a function of inadequacy of the strategies evolved since independence to correct inequalities and distortions embodied in the Indian space economy during the period of colonial rule. These stresses in recent years have acquired alarming proportions and have been weakening the foundation of Indian unity and integrity. The recent turmoil in the northeastern states, and in West Bengal, Gorkhaland agitation, which are extremely backward regions are indications to these threats. The growing trend of regionalism, secessionism and separatism in these areas are due to frustration of the people particularly young generation arising out of prolonged regional disparities. It has been observed that problems arising out of socio-economic disparities often get linked with linguistic and cultural affinities of the region. These problems take serious shape and subsequently become difficult to eliminate.

There are many ways of analysing spatial disparities in the level of socio-economic development, but the regional approach which permit the vertical integration of socio-economic condition and horizontal variations over space, is of paramount importance. Using the spatial approach of a unit of spatial organisation of society in terms of certain selected indicators of the level of socio-economic development can be identified. Once the regions of underdeveloped have been identified, an analysis of the main factors contributing to disparities in the level of development. Only then strategies and measures for spatial order can be suggested.

This study has been divided into Six chapters. The first three chapters are theoretical and are intended to provide the
base for conceptual parameters. While the last two are mainly analytical in nature. Chapter first deals with a general geographical characteristics of the study area. The second chapter is devoted to the review of literature and third chapter deals with significance and selection of indicators and the methodological framework for the analysis of this study. It contains conceptual framework of indicators, a brief history of evolution of indicator movement in the world in general and India in particular. The rationale behind selecting various indicators for measuring disparities, in the study area has also been discussed in this chapter. The fourth chapter deals with the identification of regions of relative levels of development and disparities using the standard score additive models. While the fifth chapter highlights the relative importance of different variables and factors responsible for creating spatial disparities in the study area based on Factor Analysis. The concluding chapter discusses the main findings of this study and also highlights corrective measures for minimisation of the existing regional imbalance found in the study area.

The state of West Bengal lies between $21^\circ38'$ and $27^\circ10'$ North latitudes and $85^\circ50'$ and $89^\circ50'$ East longitude. It is located in the north eastern part of the country, and extends over 87853 Sq. kms, and covers a little less than three percent of India's land area. It is bounded on the north by Bhutan and the state of Sikkim, on the east by Bangladesh, on the north east by the state of Assam, on the south by the Bay of Bengal, on the south west by the state of Orissa, on the north-west by Nepal and on the west by the state of Bihar and Jharkhand.

The main objectives of the present study are as follows:

1. To identify the regions of relative levels of development in terms of a large number of social and economic indicators sector wise as well as in aggregate.
2. To study dimensions of disparities.
3. To highlight factors and processes responsible for emerging patterns of socio-economic disparities and
4. To suggest remedial measures for their minimisation.

Various hypotheses have been constructed to investigate the problem of socio-economic development and regional disparities. Testing of these hypotheses in the area under study is the crux of the research problem. Following are the major hypothesis of this research.

i. The level of socio-economic development is directly related to urbanization and industrialization.

ii. There is marked regional, social and economic disparities in the study area and the backward regions are characterised by a large proportion of their population depending on primary activities.

iii. Regional disparities can be reduced by maximizing regional income. This will involve utilizing natural and human resources, especially maximising the utilisation of work force.

The study is based on secondary sources of data collected from census, publications and different concerned state government departments. The disparities have been perceived in terms of a wide range of indicators covering the areas of health, housing, education, urbanisation, per capita income, agricultural development and industrial development etc. The spatial dimensions of disparities have been measured using the technique of standardized score additive Model and Factor Analysis. Districts have been chosen as unit of analysis, keeping in view the availability of data and nature of the problem.

The basic findings of the foregoing study shows that there are wide inter-district disparities in the level of socio-economic development in West Bengal. The highly developed areas are small in extent and are largely confined to the south
Bengal comprising the district of Howrah, Calcutta, Burdwan and 24-Pargana. While remaining districts are extremely backward with some exceptions in the case of Darjeeling and Hooghly district which are moderately developed. The main reason for high level of development may be attributed to their higher degree of Industrialisation and urbanisation. They are developed due to the advantage of being located in one of the richest mineral belts of India and also previous advantages, of big industrial complexes like Durgapur, Asansol, Hooghly, Calcutta and Haldia port which lie in this region. There is also good accessibility of railways, roads, and location of DVC Hydel Power Plants, and many other Thermal Power Plant.

On the other hand the underdeveloped regions lie in the south western part and between north and south Bengal. The south western region comprises the districts of Purulia and Bankura while the other backward regions include the district of Malda and West Dinajpore. Their under privileged conditions can be attributed to the fact that these districts are agriculturally as well as industrially backward. Agricultural productivity is low, the size of the land holdings are small and too many people are dependent on farming. Farmers do not adequately use the modern inputs such as chemical fertilizers, insecticides, pesticides, assured means of irrigation and modern agricultural tools and implements to raise the productivity. This region is also facing the problems of drought and flood, as a result crops are destroyed almost every year. These districts also lack in urbanization, industrialisation and infrastructural facilities, that leads to their backwardness. All these factors have increased the gap in the level of development between developed and backward regions. Thus, there are a few islands of developed area in the vast ocean of either moderately developed or underdeveloped areas.
The factorial analysis of the regional disparities in the study area has shown three dimensions, (i) Urbanisation and Socio-economic development, (ii) Agricultural productivity and Infrastructure (iii) Industrialisation and Education.

The first factor, urbanisation and socio-economic development accounts for 46.37 per cent of the total variance. The nature of factor loadings indicates that almost all the factors of socio-economic development are positively associated with urbanisation. The indicators which have very high positive loadings with urbanisation are Pucca house to total houses, Banks per lakh of population, per capita income, literacy, Hospital beds per lakh of population and non-agricultural employment. This factor shows that there are concentrations of amenities and facilities in urban centers and they are more socially developed than their rural counterpart.

The spatial pattern of the first factor shows that the areas of very high scores of socio-economic development are Calcutta, Howrah, Hooghly and Burdwan. The backward districts in terms of socio-economic development are Purulia, Bankura, Birbhum, Midnapore, Murshidabad, Malda, West Dinajpore and Cooch Behar.

The second dimension is agricultural productivity and infrastructure explains 19.70 percent of the total variance. It indicates that heavy inputs in the form of irrigation facilities, fertilizers, high yielding varieties of seeds, intensive cropping and mechanisation of agriculture has direct bearing on productivity and yield per hectare has increased. Besides this infrastructural facilities has also developed tremendously especially, availability of electricity, transport and communication etc.

The spatial pattern of this factor reveals that the regions with high agricultural productivity and infrastructural facilities are Hooghly, Burdwan, Howrah and Nadia. The most
backward district in this regard is Purulia, where development of agriculture over the western plateau region is poor, because of the rocky laterite soil and scarcity of water.

The third factor is labeled as dimensions of Industrialisation and Education. It accounts for 9.63 percent of the total variance. There is a close relationship between Industrialisation and education. The region, which is highly industrialized, the standard of educational development in these areas are also very high. Industrialisation is a key force for rapid development. Due to rapid Industrialisation most of the infrastructural facilities, such as schools, hospitals, means of transport and communication, power and banking institution expand in the area. In such areas, favourable teacher-student ratio may be due to the fact that besides government and private schools, the big industrial establishment have also established their own schools. Thus the burden of students on government schools is also shared by schools of different Industrial units.

Spatial variation in terms of third factor shows that there are large area around Calcutta which are highly developed, educationally as well as industrially. These districts comprise of Calcutta, Howrah, and 24-Pargana. There are only two districts namely Bankura and Purulia which are highly backward.

It can be put forward that the disparity exists because of natural, historical, economic and social reasons. Allocative mechanism also involved in the spatial distribution of developmental resources, invariably operates infavour of the developed regions, with the result that, the economic reward accruing to different regions are unequal. Political factors also play an important role not only for allocation of resources but also for their implementation.

A bold step should be taken for the removal of backwardness from the region which are lagging behind. The
analysis indicates a number of directions which should be initiated to improve the level of development and to minimise the inter‐district disparities in West Bengal. It is desirable that the region which lag behind in industrial development and are bereft of infrastructure, local or regional industries (small scale, and agro‐based) instead of large projects have to be developed in northern regions (Darjeeling, Jalpaiguri and Cooch Behar), north central regions (Nadia, Murshidabad, Malda and West Dinajpore regions Midnapore, Purulia, Bankura and Birbhum) of the state. This may bring about some equity in the level of development and better functional integration of industrial centers can be achieved.

Since agriculture is the backbone of the majority of the population in the region, it should be given a high priority. Agricultural operation in Bengal is still by and large dependent on the vagaries of nature. Therefore, more stress should be given to (i) Availability of inputs such as assured means of irrigation, improved seeds, fertilizers and insecticides and pesticides and (ii) Developed agricultural infrastructural facilities such as financial institutions, agricultural marketing, agricultural loans and subsidies and modern tools and equipments of farming. These measures would ultimately increase the productivity and diversify the agriculture in the state.

Presently, formulation of district plan is done at the district level, it should be in the fitness of things to formulate it at the lowest unit of planning in the state i.e. at the Block level, so that local resources can be utilised and the real benefits shell reach the grass root level.

For a balanced and meaningful development of the state and to reduce the gap between the districts, more attention should be given on agricultural as well as Industrial development. Higher agricultural productivity through improved methods of cultivation should be attained.
Therefore, a high priority of investment must be given to agriculture. The diversification of industrial sector to the backward regions is the need of the hour.

The development of infrastructure is required to industrialise the comparatively backward areas. This is so because infrastructural development like electricity, roads, railways, banks and post offices assume great significance. Such developments bring about other economic activities and hence, investment in infrastructure has to be made in anticipation for future development.

Effective adult education and vocational training in the backward districts should be promoted to provide incentives for education through job-oriented courses in order to provide employment opportunities in the backward areas.

There should be provision of better medical facilities in the remote areas, so that under privileged people can be benefited from the fruits of development. So direct investment by the government in the backward regions is needed.

With the liberalisations of economy, a conducive atmosphere should be created to attract the foreign capital investment and it should be diverted to the backward districts.
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2002
DEDICATED TO
THE LOVING
MEMORY OF MY FATHER
LATE MOHD. TAHIR HUSAIN
Certificate

This is to certify that the thesis entitled "Regional Disparities in Socio-economic Development in West Bengal" has been submitted for the award of Ph.D. degree in Geography of Aligarh Muslim University, Aligarh, India is the original work of MdShamim. The work has been done under my supervision.

(Prof. Azimuddin Qureshi)
Chairman
Department of Geography
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Md. Shamim

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INTRODUCTION
INTRODUCTION

One of the serious problems that India is facing today is the problem of regional disparities. It results in social, economic and political instability. The current tension and strain in the Indian polity are essentially a function of inadequacy of the strategies evolved since independence to correct inequalities and distortions embodied in the Indian space economy during the period of colonial rule.¹ These stresses in recent years have acquired alarming proportions and have been weakening the foundation of Indian unity and integrity. The recent turmoil in the northeastern states and in West Bengal, Gorkhaland agitation, which are extremely backward regions are indications to these threats. The growing trend of regionalism, secessionism and separatism in these areas are due to frustration of the people particularly young generation arising out of prolonged regional disparities. It has been observed that problems arising out of socio-economic disparities often get linked with linguistic and cultural affinities of the region. These problems take serious shape and subsequently become difficult to eliminate.
Problems related to economic development and undesirable regional disparities have attracted the attention of Economist, Planners, Geographers and Regional Scientists for several decades. The world today is divided into two unequal parts. One consists of relatively small group of economically developed countries, and the other of a vast number of poor and economically backward ones. The economic inequality of nations is not a quirk of historical development, but is caused by numerous and diverse objective and subjective factors, the socio-economic one being paramount among them. The problem of regional disparities exists almost in all countries in various degrees. In the developed countries the problem is confined to a few depressed areas. The areas which, for geographical and other reasons are found to be lagging behind in the process of development. But in developing countries the problem often assumes serious proportions due to the size and nature of the problem that is different in the sense that there are only a few highly developed areas in the midst of large proportion of the country which are underdeveloped. In developing countries, the regional factors underline many of the pressing socio-economic backwardness which is somewhat different from
that of developed countries. Regional disparities arise due to faster growth of some regions, while other remains behind the former regions and lagging in terms of growth of industry, employment, and other economic activities offering high rate of return. These areas which are lagging are often called as ‘distressed’ ‘depressed’ or ‘lagging’ regions or ‘backward’ regions. Regional disparities have turned into a political problem for many countries; such as Nigeria, Pakistan, Sudan, Malaysia and India. These problems of disparities have not been only in developing countries but also in developed countries like USA (Appalachian region) in former USSR (Uzbek region), UK (Central Scotland, North Ireland, East England), Italy (Mezzogiorno) former Yugoslavia (Bosnia Herzegovina) etc. However, the degree of disparities vary between developing and developed countries. The gap between regions in terms of disparities is more in developing countries than developed ones. Nature itself creates imbalances in the form of relief, climate, biotic cover and mineral endowments and man operates in this setting. The imbalances produced by nature have been aggravated by man as well. Reasons for underdevelopment of some areas are many, for example improper utilization of resources, low
savings, low output, high propensity to consume, high dependency ratio, large proportion of population depending on agriculture etc. In contrast, a developed region has a greater potential for better use of capital, labour and available natural resources to support its present population at a higher level of living and high per capita income. Another reason for regional disparity is the result of rural-urban inequilibrium in economic activities, employment and educational opportunities, medical facilities and other services. The spread and assimilation of better technologies play an important role, as in course of time it can significantly modify and upgrade the socio-cultural milieu.6 But in reality, in the present systematic context, technological development remains generally limited to a few developed regions, leaving other regions undeveloped and sometimes underdeveloped. The latter usually have to do with traditional technologies and are thus unable to judiciously satisfy the needs of growing population. Thus, the spatial pattern of disparities between developed and underdeveloped regions continue to persist relatively even though in absolute terms, considerable development may have taken place in the underdeveloped regions. Therefore, it may be stated that the
socio-economic development of the developed regions is often at the cost of increasing underdevelopment of other regions whenever development over different regions occurs unequally, regional imbalances are seen that leads to underutilization of natural and human resources, resulting in discrimination of individuals. There is often a tendency for the developed regions to be developed even faster than the lagging regions.⁷

In order to understand the processes involved in creating disparities between developed and underdeveloped regions, it is necessary to keep in mind, that inequality is an outcome as well as manifestation of factors which are predominantly structural rather than social, economic, cultural, historical and political mesh of the area and form an inherent part of the society.

There are many ways of analysing spatial disparities in the level of socio-economic development, but the regional approach which permit the vertical integration of socio-economic condition and horizontal variations over space, is of paramount importance. Using the spatial approach of a unit of spatial organisation of society in terms of certain selected indicators of the level of socio-economic development can be
identified. Once the regions of underdeveloped have been identified, an analysis of the main factors contributing to disparities in the level of development. Only then strategies and measures for spatial order can be suggested.

The Study Area

The state of West Bengal lies between $21^\circ 38'$ and $27^\circ 10'$ North latitudes and $85^\circ 50'$ and $89^\circ 50'$ East longitude. It is located in the north eastern part of the country, and extends over 87,853 Sq. kms, and covers a little less than three percent of India's land area. It is bounded on the north by Bhutan and the state of Sikkim, on the east by Bangladesh, on the north east by the state of Assam, on the south by the Bay of Bengal, on the south west by the state of Orissa, on the north-west by Nepal and on the west by the state of Bihar and Jharkhand. It has two distinct land forms, i.e. hilly northern Himalayan highlands and the alluvial plain in the south. Variations in altitude results in a great diversity of climate specially temperature and rainfall in the study area.

Above 67 million people live in West Bengal which accounts for more than eight per cent of the total population of India according to the census 1991. Although it is one of the small states in terms of area, yet the number of people
living on every square kilometer is highest (766) in the country. About three quarters of the population lives in the villages. Agriculture plays a pivotal role in the state’s income and three out of four persons in the state are directly or indirectly involved in agriculture. The chief agricultural crops are jute, rice, tea, potato, oilseeds, tobacco, wheat and maize. The state also occupies a leading position in rice and jute growing state of India.

West Bengal occupies a key position among the eastern states in India in industrial development and also an important mineral producing region, like coal, dolomite, limestone and China clay etc. It has steel plants, automobile-manufacturing plant, and numerous chemical, machinery-building and high engineering industries.

**Aims and Objective:**

The main objectives of the present study are as follows:

1. To identify the regions of relative levels of development in terms of a large number of social and economic indicators sector wise as well as in aggregate.

2. To study dimensions of disparities.
3. To highlight factors and processes responsible for emerging patterns of socio-economic disparities and
4. To suggest remedial measures for their minimisation.

HYPOTHESIS

Various hypotheses have been constructed to investigate the problem of socio-economic development and regional disparities. Testing of these hypotheses in the area under study is the crux of the research problem. Following are the major hypothesis of this research.

i. The level of socio-economic development is directly related to urbanization and industrialization.

ii. There is marked regional, social and economic disparities in the study area and the backward regions are characterised by a large proportion of their population depending on primary activities.

iii. Regional disparities can be reduced by maximizing regional income. This will involve utilizing natural and human resources, especially maximising the utilisation of work force.

Data base and Technique of Analysis:

The study is based on secondary sources of data collected from census, publications and different concerned
state government departments. The disparities have been perceived in terms of a wide range of indicators covering the areas of health, housing, education, urbanisation, per capita income, agricultural development and industrial development etc. The spatial dimensions of disparities have been measured using the technique of standardized score additive Model and Factor Analysis. Districts have been chosen as unit of analysis, keeping in view the availability of data and nature of the problem.

**Organisation of the Study**

This study has been divided into Six chapters. The first three chapters are theoretical and are intended to provide the base for conceptual parameters. While the last two are mainly analytical in nature. Chapter first deals with a general geographical characteristics of the study area. The second chapter is devoted to the review of literature and third chapter deals with significance and selection of indicators and the methodological framework for the analysis of this study. It contains conceptual framework of indicators, a brief history of evolution of indicator movement in the world in general and India in particular. The rationale behind selecting various indicators for measuring disparities, in the study area has
also been discussed in this chapter. The fourth chapter deals with the identification of regions of relative levels of development and disparities using the standard score additive models. While the fifth chapter highlights the relative importance of different variables and factors responsible for creating spatial disparities in the study area based on Factor Analysis. The concluding chapter discusses the main findings of this study and also highlights corrective measures for minimisation of the existing regional imbalance found in the study area.

References


CHAPTER 1

THE STUDY AREA: ITS ENVIRONMENTAL SETTING
CHAPTER 1

The Study Area: Its Environmental Setting

West Bengal is born out of the historic partition of India, accompanying independence on August 15, 1947, with an area of about 87,853 squares kilometers, a little less than three percent (3%) of India’s land cover and twelfth among the Indian states.¹ The state grew a bulk with accession of territories in three stages, once in 1950, when Coach Behar (erstwhile a princely state), then in 1954 when Chander nagone (formerly a French settlement) and finally in 1956, when on the recommendation of the ‘states Reorganization Committee’, The Purulia sub-division of Manbhum district and a portion of the Kishanganj sub-division of Purnea district (both previously belong to Bihar) were incorporated within the state.² Divided into Sixteen districts under three administrative divisions namely

1. Presidency division (i) Calcutta (ii) Howrah (iii) 24-Parhgamnas (iv) Nadia (v) Murshidabad.

2. Burdwan Division – (i) Bradhman (ii) Birbhum (iii) Bankura (iii) Hoogli (iv) Meduipur (v) Purulia.
3. Jalpaiguri Division (i) Jalpaiguri (ii) Darjeeling (iii) Koochbehar (iv) West Dinajpur (v) Maldah

LOCATION

The state of West Bengal extends approximately within 21°38' and 27°10' North latitudes and 85°50' and 89°50' East longitudes. The tropic of cancer passes through Burdwan district and very near Shantiniketan, the poet Rabinder Nath giving the name ‘uttarayan’ to his residence for this reason. State stretches from the outer Himalaya in the North down to the Bay of Bengal in South. It has common boundaries with Nepal, Bangladesh and the states have special treaty relation with this country. Sikkim on the North-East Assam and Bangladesh on the East, Nepal and Bihar on the West and Orissa on the South west. With direct access to the sea and a network of National and International air links, the state’s geographic location makes it truly ‘The Gateway of India’ in the East. The special strategic importance of this state, also from the fact that the narrow neck or ‘Naral Bari Neck’, which connect its northern most region with the main body of West Bengal, provides, the only corridor between the north-eastern zone comprising, Assam, Nagaland, Manipur, Tripura and
Meghalaya on the one hand and the rest of the country on the other.⁶

Geography of the state has forced different region's of the state to have natural economic linkage with areas outside the boundary of the state also.⁷

**Physiography**

West Bengal is essentially a flat, featureless plain, a large portion of it being a part of the delta of river Ganga. Only one (1%) percent of her area in the far north is really mountainous. The plateau fringe and the Purulia triangle of upland along her western border comprises about six-percent of the total area.⁸ The land area within the boundaries of the state of West Bengal may be classified into three broad physiographic divisions depicted in Figure 1.3.

1. **The Northern Mountains**
2. **The Plateau Fringe**
3. **The Plains**

**The Northern Mountains**

The mountainous area in the north, through small is a part of the world’s loftiest mountains, the Himalayas. Darjeeling District, covers an area of 3075 km², of which about 2195 sq km area forms the Darjeeling Himalayas and
the rest forms a part of the north Bengal plain. It rise to eternal snow in Sikkim north of Darjeeling dominated by Kanchanjangha and her five state like peaks. It has a maximum elevation of about 12,000 feet (4000 meters) above the sea level.

At an altitude of over, 7000 feet (250 meters) The Darjeeling Himalayas rises abruptly from the plains of North Bengal to attain great highest within a short distance of the foothills. High terrain, steep gradients, heavy rains, averaging from 80 to 160 inches in place and torrential streams makes the region extremely susceptible to soil erosion and land slides. Darjeeling town, the summer capital of the state, lends access to the majestic panorama of the towering Himalayas, and is acknowledged universally as a charming tourist resort. In the northern zone the two other districts that is, Jalpaiguri and Coochbehar consist mainly of low lying plains. A number of swift flowing perennial rivers and their tributaries, such as the Tista, the Jaldhaka and the Ranjit, traverse this region. These rivers not infrequently liable the have floods but capable of considerable damage during the rains. These are not inconsiderable also in their hydel potential. The rivers present worrying problems and offers welcome possibilities as well to the region.
The Plateau Fringe

This is a rolling upland, with small isolated hills standing here and there, breaking the monotony of the flattish landscape. The extensions of the Chotanagpur plateau in the western bulge of the state, which comprises in the district of Purulia and the Contiguous parts Midnapore, Burdwan and Birbhum districts. The red soils and the fast disappearing green forest in this region, is made up of pene-plain old rocks, most of which are below the 500 feet contour. But there are some which rise to over 1000 feet and stand out as majestic monadnocks. These rocky plains descend eastward to merge with the higher slopes of alluvial lands.

The Plains

The vast alluvial plains of the state spread from Jalpaiguri and Siliguri in the north to the Sundarban creeks and the Kanthi littoral in the south. The land is flat and lends itself to classification mainly on the basis of drainage characteristics. The plains in the south are built up by the Bhagirathi river and its tributaries such as Nayurakshi, the Damodar, the Kangsabati and the Rupnarayan. The river Bhagirathi is, in fact a distributary of the Ganga. The southern part consists of Gangetic plains and the moribund delta.
The rivers flows into the state in a south-easterly course between the southern border of the Malda and the northern border of Murshidabad to separate the three Himalayas districts along with the two adjoining plain districts of west Dinajpur, and Malda from the rest of the state, and to create a barrier to unbroken communication by land between the north and south. Life stream of the southern districts, the Bhagirathi, provided the Calcutta a port with a ritual link with the sea.

According to soil and drainage characteristics West Bengal plains just below the Himalayas high lands may be subdivided into a number of distinct areas. Such as

(a) The North Bengal Plains (Duars) or sub-montane terai, comprising the district of Jalpaiguri and Coochbeha. The feature of this region is slightly raised banks of old, located alluvial soil through which numerous small streams, taking their rise in the plains, wriggle in slight incised and intricate meanders. Its upper areas are still under forest mainly, sal, scrub jungle, grass and a few stately trees from the natural vegetation.

(b) Northern para-delta and Barind consisting of west Dinajpur and eastern part of Malda districts. In this region
various types of soils as they do, of patches of old alluvium, clayey silts, sandy clays and loams.

(c) The Gangetic delta comprising, the districts to the east of Bhagirathi and Hoogly (Murshidabad, Wadia, Calcutta, 24-parganas), of this tract Murshidabad and Nadia from the ‘moribund delta’. The northern half of 24-parganas including Calcutta down to a rough transverse line through Basirhat, canning and Diamond Harbour, constitutes the ‘mature delta’. The territory south of this transverse line is the ‘active delta’.

(d) The Damodar delta, consisting of Hoogly, Howrah, Midnapore. The triangular one between the Hoogly and Damodar is a land of dead and dying rivers’. Some of these are the dying channel of the Hoogly, which carried a lot of water of the Ganga River. This tract has been formed by the hydraulic interactions of the Damodar and the Hoogly. The land in this tract is dead, flat and often marshy more so in the south. The south eastern margins of Howrah and the mouth of Rupuarayam are still ‘active’ delta which continues along the coast line of Midnapore. In this tract, some of the former channels of the Damodar had lost their head waters by silting or by shifts of the river and the area was as a
result reduced to a region of silted and stagnant channels. But the network of Damodar canals has recently re-associated it.

Uplands of the Western Plateau Fringe or Rarh region comprising the district of Bankura Birbhum, Burdwan and Purulia and part of Midnapore.

**Sundarban’s Delta**

In the extreme south, the plains extend into the complex pattern of tidal creeks, mud flats and newly formed islands, which are covered by dense mangrove vegetation, consisting of masses of tangled still like roots of ‘Keya’ or ‘Kewra’ bushes vistas of spikes, jutting out of the muddy surface, which are in relatively tabular breathing roots, connected with the underground root system characteristic clumps of Nippa palms and ‘Golpata’ grasses in which the ‘Bengal Tigers’ who are generally man-eaters, lurk. Here new land is being built slowly day by day, by mud and silt brought by rivers to the numerous months of the Ganga.

**Kanthi Coastal Strip**

The physical setting of this strip of land along the sea coastal consists of sandunes and salt marshed mingled with each others. The measures of the mouth of the Ganga changes
the sea water with the copious supply of grey and yellow mud and silt. The marshes are formed behind well-developed sand bars. At places there are large shifting sandunes which have a tendency to blow land wards and encroach upon the cultivated land behind them. At places the coast is eroded by sea waves and currents. Vistas pf casuarain plantations are being developed all along the coast to fix the dunes and stop sea erosion. The Japanese quick growing creeper kudzu is also being planted.

**Drainage**

West Bengal is a land of many rivers. A number of rivers rises on the Himalayas. But only the Ganges the Tista and some of their tributaries rise from the glaciers on high altitudes. The other rise mainly from the drain-outs of the precipitation on the different sectors of he Himalayas ranges. During dry seasons, the latter type of rivers are either feeble or dry. As there is no glacier born rivers came from outside the state.

The Ganges, with its down distributaries and tributaries, form the central rivers system of lower West Bengal. A number of rivers rise on the far extended table-land of Chotanagpur plateau. These are all rainfed rivers. In their upper reaches,
they are like rivulets in dry seasons. But down the stream, where several of them combine together (the key tidal benefits also, if not too far from the bay), they look like rivers. But during the rainy days, they are wide, impressive and swift moving. A numbers of rivers rise within the state and after taking short journey, they meet either the Bhagirathi or one of its tributaries.

The infra-structure of the economic in this reverie state and indeed the survival of its people are a directly and in a large measures dependent on the control of the rivers. North Bengal is transferred by a number of hilly rivers. These are torrential and swift flowing rivers bringing in huge quantities of debris including boulders from their upper catchments up in the north. Some rivers rose on the cradle of the Himalayas and flow down to the plain. The river Tista is the most important one. It is a river with very strong currents, specially before coming down to plains. The river Tista Rises from the glacier in north Sikkim. Draining Sikkim it rushes southward to touch the boundary of the Kalimpong sub-division of Darjeeling district. The main tribunal of it is Rangit.

The Torsa is another river from the Bhutan hills. It runs directly southward across the plains of Jalpaiguri and coach
Behar districts. It also receives some tributaries and at lower stage is known as the Dharla.

The Ganges striking around Rajmahal hills of Bihar, it touches West Bengal at the south western boundary of Malda district. Further down, the river reaches the northern boundary of Murshidabad district, i.e. the river actually enters within the state having Malda at north and Murshidabad at south.

The Damodar, the Rupnarayan, the Ajay, the Mayurakshi, the Kossye etc are the other main rivers of the Burdwan division. They rise either in the hills of Santhal Parganas or in the vast table land of Chotanagpur Plateau in Bihar and flow down to meet the Hooghly as its tributaries. The Damodar had a very bad reputation for causing havoc of floods and that why it also called as “Sorrow of Bengal”. After rainy season, the rivers once again become shallow and feeble.

The Bhairab, the name Bhairab means the “Terrible” and its past activities amply justifies the name. The river takes off from the Ganges about 16 km west of Akheriganj in Murshidabad and after a tortuous course across the district, loses itself in the Jalanji.
The streams draining the Rarh plain, notable among them being the Mayurakshi, the Damodar, the Dwar Keswar, the Kasai and Subarnarekha, the first three belonging to the Bhagirathi-Hoogly system.

The Dwarkeshwar is the most important river of Bankura district. It originates within Manbhum district of Bihar. The Subarnarekha comes in from Bihar and goes out to Orissa before it flows into the Bay of Bengal. It travels across the south west of Midnapore district along an arc-like curved course. It mainly flows through Jhargram subdivision. It is said that traces of Gold are found on its bed and such it has derived the name. but due to prohibitive cost of recovery of cost, it has been left alone.

The Mayurakshi rises in the south parganas of Bihar. It is the main river system of Birbhum district. In Birbhum. it has an easterly course.

The part of Calcutta is nerve centre of the state, it takes crores of rupees yearly for dredging the river bed to keep the river navigable. As the tides and felt strongly upto Calcutta the ocean going vassals enter and leave the port mostly banking on these tides.
CLIMATE

The region experience a hot and humid monsoonal climate. The proximity of the Bay of Bengal on the south, the alignment of the Himalaya in the north and that of the Meghalaya plateau in the north-east determine largely the climatic character, i.e., the distribution of the weather elements with respect to time and space. Irrespective of the general vagaries and mechanism of the monsoon, the spatial and seasonal distributions of the element such as temperature, rainfall and relative humidity are too uneven.10

The tropic of cancer runs across the middle of the district, of Nadia and Burdwan and the northern portion of the district of Bankura. The area lying north of the line, falls with what it is known as the North Temperate Zone and the southern portion within the Torrid (i.e., Equatorial) Zone. Though the lower portion lies within the Torrid zone, presence of the Bay of Bengal, network of the river system, Canals, tanks, etc. do not allow extreme climatic conditions to prevail upon.

Except for the Himalaya region, the state has generally a tropical, hot and humid, monsoon type of climate. The temperature in the Himalayan district varies from well known below freezing point in winter to over 80°F (26°C) in summer,
while summers are sticky in the plains, and uncomfortable to the utmost. Though humidity is high, winters are Pleasant all over the state, though a bit too serve for the plains people in the mountain.

An important feature of the climatic conditions of the state in the periodic winds that blow across it. The seasonal; winds are known as the monsoons.

The climate of West Bengal can be best described under the four seasons recognized by the meteorological departments government of India. The four seasons of the state are:

a) The Hot season
b) The advance of the monsoon
c) The retreat of the monsoon and
d) The cold season.

The state can be divided into two broad regions, which influences the climatic conditions of the state viz, (i) Himalayan and Sub-Himalayan West Bengal (ii) Gangetic West Bengal.

i) Himalayan and Sub-Himalayan West Bengal

The district of Darjeeling and Jalpaiguri and Cooch Behar form this region. Jalpaiguri and Cooch Behar districts mostly are plain, but in the north of Jalpaiguri district abruptly appears, the mighty foot hills of Himalayas. Darjeeling district
is on the Himalayas. Further north stand the majestic, snow
cloud mountain ranges and peaks of the Great Himalayas. This
natural wised and lofty wall system had great influence over
the rainfall and other weather of this region.

(ii) Gangetic West Bengal have it own significance in the
formation of various types of climatic conditions in this region.

**The Hot Season:**

In West Bengal this season roughly covers the period
between first March and Tenth June, the normal data of the
arrival of the monsoon. Temperature starts increasing from the
month of Mach. May is the hottest month. The western parts
records some of the highest temperature in the state. In Bengal
the thunder storm (i.e. the Norwester) that rise between April
and may are locally known as ‘Kal Baisakhi’, such storm do not
affect extensive areas and such may be considered as local
atmospheric disturbances. These Norwester bring down the
temperature for a short while and give relief to the people in the
hot summer evening.

The highest temperature of the year are recorded in the
first or the Second week of April, 40°C is often recorded during
the day, and a degree or two more than this produces a most
uncomfortable scorching sensation. The humidity is low and so
there is less precipitation. The plateau fringe at this time is even hotter. Maximum temperature during the day rises up to 45°C. Asansol is the hottest place in West Bengal. The heat is slightly less in Malda Pouch, and even lesser in the northern plains. May is the hottest month. Durgapur and Bankura often recorded almost 45°C as highest day temperature for over two months. But places near sea like Calcutta and contain are not so hot.

On the other hand April, however is a very pleasant month in the Darjeeling hills. At we go up mountain temperatures decreases, so Darjeeling has a temperature about 10°C less than Siliguri. People from the hot plains flock to the hills in these months.

**Advance of the Monsoon**

The natural causes that guide monsoon winds, present a complex study. By the 15th June, the whole of West Bengal is under the influence of monsoon winds. The summer monsoon that carries moisture from the Bay of Bengal, blows almost across whole of the head of the Bay of Bengal. One portion, reaching the Arakan and Burma coast, brings heavy downpour in the area. Another wing posses across the Brahamputra-Gangetic delta, i.e., across lower West Bengal and Bangladesh. This wing is the one, on which depends the rainfall of the
Brahmaputra-Gangetic plain. Heavy rains start all over the state, from the advancing rolls of dark, low number clouds. There is a little thunder. The bursting of the monsoon in a joyous Phenomena for the farmers in the country, for upon it depends, his crop, his food and his prosperity.

The bursting of the monsoon may be extremely vigorous, if a depression forms at the heat of the Bay at this time. If the depressions are some what unfavorable, rainfall may not be normal. Due to such complications, sometime scanty and excessive rainfall is early, sometimes late in a normal phenomenon. If the monsoon start late, the agricultural operations get a bad starts. The rainy season is the most important season in West Bengal. Not only it bring welcome relief from the terrible heat but, also it helps growth of plants. It begins agricultural activities within few days the whole scene is changed. The normal time of north west monsoon in Calcutta is 8th June. But it varies between 20th May and 20th June.

The Figure 1.4 shows the distribution of rainfall. The average rainfall in the state is about 70 inches (175 cms) of which over 50 inches (125 cms) precipitate during June to September, the Monsoon months. There are however, wide regional variation in rainfall. The Himalayan region receives the heaviest rainfall, ranging from 100 inches (250 cms) to over
200 inches (500 cms), while the plain district receives on an average 45 inches (125 cms) 75 inches (187 cms) Among the district, Bankura has the lowest rainfall 47 inches or (117 cms) and Jalpaiguri the highest 156 inches or (390 cms). The Mahananda corridor, the Sundarban and Kanthi coastal strip get about 200 cm in a year. Rainfall in Midnapore, Howrah, Hooghly, Nadia and the northern half of 24-pargana is between 140 and 160 cms.

With such wide variations, the state frequently suffers from drought and floods. Droughts in the state more often means what of adequate rainfall in time than complete failure of rainfall. Similarly, floods are always without their compensation; as they flush the land, the land gets regarded by the deposition of silt.

The Autumn Season or Season of Relating Monsoon

The overhead position of the sun shifts of the southern Hemisphere, after the September and the intensity of the low pressure over the north-western part of India decreases. As a result the south monsoon winds start moving back towards the sea. This is called the retreating of the monsoon winds. Land to sea wind sets in by October and become well established by November. Cool and dry winds blow out from the land to sea
during this time. The retreat of the south-west monsoon over West Bengal is completed by the end of November.

**The Cold Season**

From December to February West Bengal is under the influence of North East Trade winds. This wind is offshore and has no moisture. As a result there is no rainfall in the winter months. The climate is cool and sunny-January invariably appears as the coldest month. the temperature ranging between $17^\circ C$ and $21^\circ C$ and increasing southward (Sagar Islands) $20.4^\circ C$. The regional variation is considerably low but becomes significant when analyzed with respect to the occasional cold spells accompanied with the western disturbances. The temperature over the western plateau areas drops considerably, but the region does not becomes as cold as the mountainous districts in the north. Morning fog is very frequent even over the plains. This is the most pleasant season over the plains of West Bengal. The minimum temperature at night is always above $15^\circ C$. The climate of the mountainous district in the north of West Bengal are different from the rest of the state. The mountains are always cooler than the plains. January is the coldest month in the hills. Average daily temperature is about $5.2^\circ C$. Frost are common cold waves hit
the northern districts from November to March, when temperature drops below freezing point. Darjeeling receives moderate snowfall in the winter months. At night altitude heavy winter snowfall is common.

SOILS

Soil is one of the most precious resources and is the mainstay of agriculture and forestry. It is one of the gifts of nature which determine agricultural productivity. Soils are economically important as different types of soils of varying nature produced different varieties and amounts of crop leading to economic disparities.

There are four principal types of soil in the state, namely, The laterite Soils of the hills region of the north Chiefly in Darjeeling and Jalpaiguri district; the red acidic laterite soils of the western parts of the state, comprising the districts of Purulia, Bankura and Birbhum and parts of the districts of Midnapore and Burdwan; The deltaic and Saline soils the mangrove areas of the southernmost parts of 24-parganas district and the alluvial soils in the rest of the state including the Gangetic delta lands in the south and Gangetic plain the north.  

e) Laterite Soil
ii) Red Soil

iii) Terai Soil

iv) The Alluvial Soil and

v) The Mangrove (Coastal Soil)

**Laterite Soil:**

The Figure 1.5 depicted the main soil types of West Bengal Vegetation altitude, which affects temperature, and moisture are greatly responsible for the development of soils of the moistures. In the sub-tropical belt the soils are rich in humus, but the steep slopes which are found in this area force the soils to slip downwards by gravity. Bad forest management aided by heavy rain has also led to frequent landslides. So much good, well developed soil is lost. The unasserted materials deposited at the foot of the Darjeeling Himalaya are responsible for the soils in Jalpaiguri and Silliguri tahsils with an areal coverage of about 6,600 km². The deficiency of plant food and organic matter and acidity (pH 5.8 – 6.7) are common. The temperate belt, higher up, very good brown forest soils are found. Terai soil are found in the foot hills of the Himalayan region.

**Red Soil:**

The Soils of the plateau fringe are generally lateritic covering an area about (5.888 km²) are found in the undulating
FIG. 1.5

INDEX
- LATERITE SOIL
- RED SOIL
- TARAI SOIL
- ALLUVIAL SOIL
- COASTAL SOIL

WEST BENGAL SOILS

BONGAIPUR

BAY OF BENGAL

SOUTH 24 PARGANAS

BHUTAN

ASSAM

BANGLADESH

BIHAR

ORISSA

SIKKIM

FIG. 1.5
well drained track along Chotanagpur high land in the western part of the state, very often they are red loams. Their fertility is medium. They are residual soils and acidic in nature (pH 5.5 – 6.6), deficient in inorganic matter and are poorly irrigated, because possess low water holding capacity. The transported laterite deposits on the eastern flanks of the lateritic stretch are known as the Red Soil (Lateritic alluvium) and are found in the eastern margin of the Rarh plain and the Brind tract of Malda and west Dinajpur covering about 4,963.6 km² area.

By proper manuring and irrigation they yield good crops. Their major defect is that they are easily eroded, perhaps more so if not properly managed. Deforestation has help a lot in making soil erosion a menace of the first magnitude in this area. There are badly gullied lands at many places. Feeble attempt are now being made to check soil as at Shantiniketan, and in the Damodar valley.

**Alluvial Soil:**

By far the most important, areally (28,921.3 km²) as well as agriculturally, are the alluvial soils. There is not much variety in the soils of the plains. All of them are alluviums transported by rivers. The two main varieties are old and new alluviums. The old alluvium soil’s found all along the outer
edge of the plateau fringe. This transported soil has lost its original fertility by leaching. Manuring improves it easily, and good crops can be obtained from it.

New alluvium spread near the river, covers parts of the North Bengal plains and the whole of the remaining West Bengal Delta excluding the coastal strips in 24-parganas and Midnapore. The soils are neutral (pH 6.5 – 7.2) and relatively poor in plant nutrients and organic matter. They may be divided into sand, silt, loam or clay according to texture. There is more sand near the river beds, and more clay further away. Also the clay content increase towards the south. Loams are the most common soils. They are also the most fertile. The Ganga alluvium is however, rich in plant nutrients and organic matter, and is alkaline in reaction.

**Man grove or the coastal Soils**

The most common soils of this region are mud impregnated with salt and are the outcome of the interaction of rivers and tides and have developed in the districts of 24-parganas and Midnapore. The soils are saline and alkaline and contain deposits rich in calcium, Magnesium and half-decomposed organic matter. The excess of salt and clay in them makes the soil too stiff for cultivation. As some places
nearer to the sea, sand is deposited near the beaches. The dense vegetational cover naturally provides decayed vegetational matter to the soil. To make these soil, cultivable, land is surrounded by closed embankment, in which salt water is not allowed to enter. Rain gradually washes away excess of salt in the three or four years, after which bumber paddy crops are obtained.

**Natural Vegetation**

Natural vegetation has almost disappeared from West Bengal, due to her heavy density of population, much of the forest areas has been cleared to make room for cultivation. There are three forest belts: (i) The mangroves and tidal forests in the Sundarban (ii) Humid tropical forests in the extreme north of the region or even green forest of the Himalayas are the only preserves of natural vegetation. (iii) Western fringes or plateau is covered by tropical deciduous forests mostly in the induced form. Table 1.1 shows the geographical distribution of forest district wise. Only 16% of the total area of West Bengal is under forest. The forest area per capita is only about 0.11 acres in the state as against 0.50 acre in India as a whole. Further the regional distribution of the forest is extremely uneven. Few
district have only scattered forest in west Bengal or they do not have not any forest cover what so ever.

These forest are related to altitude and aspects. On mountain’s different types of trees and plants grow at different heights. In the mountainous region of West Bengal,

**District wise Forest area and its Percentage to total Geographical area in West Bengal (1988)**

<table>
<thead>
<tr>
<th>District</th>
<th>Geographical area in thousand hectare</th>
<th>Forest area thousand hectare</th>
<th>% percentage of forest to Geographical area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burdwan</td>
<td>702.4</td>
<td>27.7</td>
<td>3.94</td>
</tr>
<tr>
<td>Birbhum</td>
<td>454.5</td>
<td>15.9</td>
<td>3.50</td>
</tr>
<tr>
<td>Bankura</td>
<td>688.2</td>
<td>148.2</td>
<td>21.34</td>
</tr>
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<td>Midnapore</td>
<td>1408.4</td>
<td>170.1</td>
<td>12.14</td>
</tr>
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<td>Howrah</td>
<td>1467</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Hooghly</td>
<td>314.0</td>
<td>0.3</td>
<td>0.10</td>
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<tr>
<td>24-pargana</td>
<td>1413.0</td>
<td>426.3</td>
<td>30.10</td>
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<td>Nadia</td>
<td>392.7</td>
<td>1.3</td>
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<td>532.4</td>
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<td>0.15</td>
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<tr>
<td>West Dinajpur</td>
<td>535.8</td>
<td>1.8</td>
<td>0.34</td>
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<tr>
<td>Malda</td>
<td>373.3</td>
<td>2.0</td>
<td>0.54</td>
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<td>Jalpaiguri</td>
<td>622.7</td>
<td>179.0</td>
<td>28.75</td>
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<td>Darjeeling</td>
<td>314.9</td>
<td>120.4</td>
<td>38.23</td>
</tr>
<tr>
<td>Cooch Behar</td>
<td>338.7</td>
<td>5.7</td>
<td>1.68</td>
</tr>
<tr>
<td>Purulia</td>
<td>625.9</td>
<td>87.6</td>
<td>14.00</td>
</tr>
<tr>
<td>Calcutta</td>
<td>10.4</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>

*Source: Statistical Abstract of West Bengal (1989-1999)*
emperate evergreen forests with such trees as oak, poplars and maples grow between 900-2500 meters. Between 2500 meters to 3500 meters coniferous trees such as Pine, deodar and fir grow. Still higher and found birches and rhododendrons. At the foot of the Himalaya, tropical mixed evergreen and deciduous trees are found. Some of most dense forest of West Bengal occur here. Many of them are protected. They are generally well managed and properly exploited now. The deciduous trees have shed their leaves once a year of these the Sal, Teak and Simul, Shisham are important. These forest are noted for their dense undergrowth, evergreen laurels and other moisture loving plants are found mixed up with the deciduous forest. A broad belt of trees forests stretches along the entire length of the northern district. It is broader towards the east in the Duars. Here again low level of tea gardens have taken a heavy toll of the forests. Like any other tropical rainforest, this forest is also very dense, wild animals abound in the jungles, which includes the rare and one-horned Indian Rhinoceros, the elephant and Tiger.

Deciduous and scrub vegetation covers greater part of the western regions of the lower Gaga plain in Midnapore, Bankura, Burdwan and Birbhum. scattered and isolated patches are also visible in Howrah and Hooghly districts.
Important trees of this forest are Sal, Mahua and Palash. High temperature, dry climate and poor lateritic soil do not encourage the growth of trees. Other trees are Kunda, Kusum and Arjun. Considerable parts of Murshidabad and Nadia district were once covered with dense forests. Most of these forest have been cut down to make room for cultivation. At present much of the land is used for mango orchards and mulberry cultivation.

The Sundarban is the most extensive forest land of West Bengal, situated at the mouth of the Ganga river in the southern part of 24-parganas district. The typical tree of the forest is Sundari after which the region gets its name. the wood is pink in colour and hard, mainly used for furniture, boat making and construction of buildings. The vegetation in this region has to face a very special type of environment and it has to adopt itself to it. The water is salty and ordinary plants can not grow in salt water. Near the sea mangrove vegetation predominates, the root system of this plant are usually very large to allow them to stand in deep mud. Goran, Gewa, Golpatta, Bani and Dhandal trees grown profusely. Mangrove plants have adopted themselves to grown under such conditions as saline water, rise and fall of tides and deep
accumulation of silt. Large areas of the Sundarbans have been cleared in recent years for cultivation. A dwarf of variety of palm are called nipapalm grows widely along the edge of the salt water. The most common vegetation is Keya or Kewra bushes, which grow in extensive clumps.12

Minerals

From the consideration of mineralogical resources, West Bengal is divided into two districts.

1. Mineral deposits, with the older formulations of dwars in the northern part containing the district of Darjeeling, Jalpaiguri and western Duars.

2. Rarh the western part comprising the districts of Purulia, Bankura, Burdwan, Birbhum and Midnapore in the South-west part of West Bengal.

A great variety of minerals occurs also, but only two of them have any significant production. They are coal and fire-clay of these two, coal gives 99% of the mineral wealth of the state. Coal is the principal mineral of the state and is notable for the vastness and quality of the reserves. Raniganj coalfields of national importance lie within this region. The coal reserves of the state are estimated to be over 13,000 million tons a little
less than a third of India’s total reserves. Other minerals are china clay, lime stone, Dolomite, Sandstone, Moulding sands, Silica, Ochre, Copper, Iron, manganese, Wolfram and arsenic. Below the basin structure of rocks may reveal accumulations of mineral oil, buried deep below in the rocks. Attempts to locate oil in the plains of the state have not borne fruits yet. The adjoining ore deposits of iron, copper, lead, zinc etc and their early exploitation, owing to the relative accessibility with respect to Calcutta, led to the initiation of large scale mineral based industries around Asansol near which a more sophisticated Durgapur complex has now been developed. It is notable that the region produce minerals worth about 30% of the national mineral production.

The locations of some principal mineral resources in the region are discussed below and the regions have been depicted in Figure 1.6.

Coal: The region falling in the south-west part of West Bengal contains the enormous coal resources of the Raniganj coal-field in Burdwan, which ranks second amongst the major coal producing region in India. Coal was first discovered in India in Raniganj, and even today this coals fields are very important. The coal is of good quality. The mines are not very
WEST BENGAL MINERALS

COAL ○
COPPER ○
IRON +
LEAD & SILVER Δ
LIGINITE X
GOLD
KAOLIN
LIMESTONE
ZINC
DOLAMITE
FIRE CLAY
MANGANESE
QUARTZ
SILICA
OTHERS △

FIG. 1-6
deep. Some of are them open cast. Some of the mines are gassy and requires extra care to control fire. The Raniganj coal-field are much better managed them the other coalfields of India. The coal seams of the Raniganj fields are classified into lower and upper series. Three gradations of Raniganj coal have noticed.

Darjeeling coalfields are found in the foot hills near Bagrakat and Mal. The coals are the same age as the Raniganj coals, but due to folding of rocks they have been crushed too much. After digging they crumble into powder, but their location is the far north makes them unimportant.

**Fire Clay:** Finding of very good quality is found in the Braker field. The deposits of about 4.06 million metric tones have been estimated within a depth of 6.096 meters. Deposits covering larger area are considered to be lying in greater depth. The Raniganj fireclay is of two type-Siliceous and aluminous.

**China Clay:** there are numerous small reserve of clay especially in Birbhum and Bankura. Present day extraction is concentrated at Muhammad Bazar in Birbhum over a field of 153 acres. It is estimated that the clay reserve of 300 acres remains untouched in the area. China clay also occurs in
Midnapore, but it is yet to be exploited. There are some more untouched deposits of china clay in Bankuta and Purulia.

**Iron Ore:** Deposits are found in Raniganj coalfield in iron stone which are found associated with the coal seams.

**Lime Stone:** Reserves of about 15-24 millions metric tones have been found at halda in Purulia district and also in Bankura.

**Wolfram:** Deposits occurs at Jhilimli in Bankura district; large scale mining of the reserve has not been started.

**Manganese:** Ore deposits have been located at Belphar near Gidni railway station in Midnapore. The one occurs as haematite, with low quality iron content estimated about one million tones.

**Dolomites:** Occurs extensively in the foot hills of the Himalayas. The high peaks of Buxa Duars one made up of dolomites and 100 meters thick stretches for 22 kilometers.

**Quartz:** Are of good quality occurs in the forms of veins in the gneissic country rock at Raghunathpur also occurs in Taldanga in Bankura district.

**Lead – Zinc – Copper – Silver:** The mixture ore occurs of galena at Beldih in Purulia district.
**Arsenic Ore:** is obtained in Darjeeling in small quantities at Sanpathar hill. It is used for making medicines and insecticides and also used in metallurgy for making alloys copper and lead.

**Soapstone:** is found in small quantities in Midnapore and Darjeeling.

**Mica:** Occurs in the crystalline gneisses and Schists in many places in Bankura, Midnapore and Purulia.

In conclusion it may be said that the minerals deposits in the region offer very good soap for increasing utilization, but except coal the other mineral resource of the state are not fully exploited. There are possibilities of developing various kinds of minerals indicated above. Even coal raising will have to be increased and modernized as industry develops in the country. Hence as industrial raw-material and infrastructure the mineral deposits can be said to offer a high development potential of the region.

**Spatial Distribution of Population**

**Human Resources**

The significance of human resources in a economic development of a region can hardly be over emphasized. Not only does man determines the economic pattern of resource utilization, but it itself a very dynamic essential resource,
providing the essential inputs of labour and skill in the process of utilization of natural resources. The interplay of man and resources determines the stage of development. Economic development of a region also depends to a large extent on scientific and technological advancement of the people. Though individuals nearly always more about, they congregate at certain places, and paradoxically present a fairly static distribution on the map of a region; which reflect quite a number of geographical conditions. Actually the population map of an area represents the culmination of the geographical study of the region, both physical and cultural.

Above 67 million people live in West Bengal and more than eight percent of the total population of India according to the census 1991. The area of West Bengal is smaller than many other states of India, but the number of people living on every square km in this state is the highest in India (766).

There has been nearly a continuous rise in the population of the state, being a fall only in the decade 1991-192. The rise in the last decade has been highest, amounting to a population explosion.

**Distribution and Density of Population**

The broad distributional pattern of the population of West Bengal is obtained from the table district wise. The density of
population is uneven throughout the state. The district North and South 24-paraganas has the highest the population over (12 million) while district in the North has only 1.3 million people. This shows that the distribution of population in West Bengal is not even. Some natural factors are responsible for uneven distribution of population in the state. People prefer to settle in areas where they can earn their living easily. Most people in our country earn their livelihood by farming. Areas of fertile soil and sufficient rainfall are easier of cultivate. So the deltaic plain and low lying areas of West Bengal with rich alluvial soil are thickly populated.

On the other hand, the mountains areas in the north and the infertile rocky plateau region of the west are naturally thinly populated.

People also prefer areas of pleasant climate. Darjeeling and Jalpaiguri are sparsely populated because of their cold winters as well as the uneven landscape.

Places around mines and industries are densely populated because, there are greater chances of getting jobs in these places. For example, the Damodar valley area and the Hooghly industrial regions are thickly populated. Infertile soil
and absence of large-scale industries are responsible for sparse population in the district of Bankura Birbhum and Purulia.

In West Bengal, concentration of population is highest in Calcutta and in neighbouring district of Howrah 24-parganas and Burdwan. The soil of these areas is very fertile and the rivers and rainfall supply enough water, thus, these area are agriculturally very prosperous. A large number industrial centers on the bank of the Hooghly river also attracts many people to settle in this part of West Bengal.

Rural and Urban Population

Most of the people of the state live in villages only 27.39 percent of the people live in towns and cities. Calcutta has 100 percent urban population in the state, while Howrah and North 24-pargana have about 50 percent urban population. The lowest urban population is found in Cooch Behar and Malda only about 7 percent.

While rural densities increased from 180 persons per sq. km (1901) to over 450 (1991), the urban densities shot up to over 10,000 persons per sq. km., while it was about 1800 persons during the same period. Urban population density varies from urban to urban centre. While Howrah ranks first in
rural densities, followed by Hooghly, Murshidabad etc., being lowest in Darjeeling and Jalpaiguri.

Density of population West Bengal is revealed in Figure 1.7. Perusal of the table indicates that density of population of the state as a whole was 766 persons per sq. km is roughly more than double in the national average. Judging from the national average, it is evident that the West Bengal is the most densely populated state in India. Being to the presence of state's capital and a high level of urbanization, Calcutta district (23670) is the most densely populated part of the state. Next in order of density are Howrah (2535), Hooghly (1382), 24-parganas (1175), Nadia (889) Burdwan (831) and Murshidabad (980). Other districts, which have recorded medium range of density are Malda (706), Cooch Behar (637), Midnapore (593) West Dinajpur (585), Birbhum (562), while low level of density in West Bengal are found in Purulia (354), Bankura (407), Darjeeling (424), Jalpaiguri (448), due to their different inhospitable physical and cultural underdevelopment.

Population Growth

Table 1.2, shows regional pattern of population growth in the decade 1981-91. It is clear the table that the districts which
West Bengal
Density of Population
1991

Fig. 1.7

Persons/sq. km

800 and Above
500-800
500 and Below

KM
Density of Population and Population Growth in West Bengal

Table 1.2

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Burdwan</td>
<td>7835</td>
<td>5979</td>
<td>688</td>
<td>851</td>
<td>23.66</td>
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<tr>
<td>Birbhum</td>
<td>2096</td>
<td>2556</td>
<td>461</td>
<td>562</td>
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<td>2800</td>
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<td>8350</td>
<td>479</td>
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<td>2967</td>
<td>3719</td>
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<td>3557</td>
<td>4353</td>
<td>1130</td>
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<td>24-parganas</td>
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<td>695</td>
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<td>356</td>
<td>448</td>
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<tr>
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<td>67983</td>
<td>615</td>
<td>766</td>
<td>24.55</td>
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</table>

Source: Economic Review of West Bengal 1992-93
records very high rate of population growth are Calcutta (32.76)
percent, west Dinajpur (30.22 percent) Darjeeling (30.46 percent) Nadia (29.82 percent), Murshidabad (28.1 percent and Howrah (25.34 percent). High growth rate population in Calcutta and Howrah, due to high degree of urbanization and industrial development, and the large scale of migration of people from all over the state and also from neighbouring states of Bihar Orissa and UP etc. while in the district of Murshidabad, Darjeeling and Nadia, due to the fact, thousands of refugees migrated from Bangladesh to these areas. Also some people from other state have been attracted to these districts due to availability of jobs in industries and agriculture.

Medium rate of growth of population was observed in Burdwan (23.66 percent), Midnapore (23.83 percent), Hooghly (22.37 percent) Malda (29.62 percent) Jalpaiguri 25.95 percent) etc. while low growth rate population and found in Birbhum (21.94 percent), Bankura (17.84 percent). Purulia (19.83 percent) due to their unfertile land, out migration in search of livelihood and also low level of industrial development.

Agriculture

Agriculture is the leading occupation of the people of West Bengal, about 57% of the total working population is still
engaged in agriculture to produced a third of the state income. The land under the plough gives a rather low yield of income. However, about 63% of the total geographical area of the state is occupied by agriculture, which is almost highest among all the states of India, having pressure of population on arable land, coupled with conditions of backward technology and organization, has resulted in severe under-employment of labour and low output per person engaged. The generally flat topography of the land and high fertility value of soil should help to promote agriculture.

The problems relating to agriculture in the state are mainly scarcity of arable land, low output per acre per worker, and underemployment of labour. In the prevailing situation these problems can be solved only in part through possible changes and adjustments in agriculture. A complete solution, however, will depend on a programme of integrated development spanning agriculture and other segments of the economy. The agrarian framework that evolved in the course of time following the introduction of the permanent settlement, came to exert powerful influence on the entire life and living of the people of Bengal and all its marks have not been effaced, even after a long time, after its statutory abolition. The age-old
simple and primitive practice in our agriculture were changed
during the British rule. Rather, the continuous neglect of the
productivity conditions in agriculture and the lack of
development of the agricultural infrastructure were same of the
basic civils, while the permanent settlement created in the
eastern region of India. But, in West Bengal, a part of this
region, technological changes have been taking place in
agriculture, in the post-independence days. The first period in
the 1950s is marked to be the period of irrigation, the second
period, the first half of the 1960s, is the period of other new
factors, such as mechanized minor irrigation, chemical
fertilizers, and intensive agricultural district programme. From
the second half of the 1960s, the technological period of the
Green Revolution or the high yielding variety programme with
the package of inputs, such as chemical fertilizers, pesticides
and pump sets etc. were used extensively, which bring a great
change in food production in West Bengal.

The total food grains production which is the main
component of agriculture production witnessed a remarkable
growth since 1983-84 in the state. Since then there has been
significant growth in food grains production culminating in an
all-time record production of 96 lakh tones in 1986-87. A part
from food grains production the state also achieved a record level production in oil seeds 2.64 lakh tones. Potato 35.45 lakh tones in 1986-87. Even the June crop which is not fetching remunerative price is recent years has registered significant increase in productivity.

The production of food grains in the state in 1991-92 reached a record level of 128.56 lakh tones from the production level of 112.70 lakh tones in 1990-91 surpassing the previous record production of 118.57 lakh tones achieved in 1989-90. Incidently, while in the state achieved a 14 percent growth rate in the food grain production in 1991-92 over 1990-91 at the natural level food grain production decline by 5.2 percent in the same period. Significantly the yield rate of food grains in 1991-92 also reached level of 2036 kilogram per hectare. West Bengal in terms of yielding rate of food grains for the period 1988-89 to 1990-91, was placed after, Punjab, Haryana and Tamil Nadu. The production oil seeds decline slightly. This marginal decline was because of the unfavorable weather condition during the growth period while the potato and Jute reached a record level of production respectively 43.93 lakh tones in 1991-92 and 63.73 laka bala in 1991-92. The increase was, primarily, because of the increase in the area under jute from 5 lakh hectare in 1990-91 to 5.73 lakh hectares in 1991-
92, due to the spread of irrigation, jute cultivations now have the option of cultivating others crops. These depending upon the relative price of raw jute and other crops. \(^{14}\)

The significant increase in agriculture production in the state, and the general increasing trend in agriculture production from the early eighties, as well as the ability of the agricultural sector in the state to cope with adverse weather conditions, indicate that there has been a structural changes in the agricultural production in the state, which will fringe a new phase in the over all development socio-economic conditions of the state in coming days.

**Land Utilization**

Land use studies constitute the core of spatial research. Any resource development plan depends upon accurate and fundamental information regarding the diverse uses that the unit of land area put into. \(^{15}\) The development and progress of any region solely depends on the availability and proper utilization of adequate resources in the region concerned. ‘Land in the primary element of recourse’ as anything on earth extracts its sustenance from it. Its proper utilization is a matter of utmost concern to its people. \(^{16}\) Land resources When mapped convey profound knowledge of the area.
Figure 1.8 depicts the land utilization of the state. The land use pattern in the region is of great significance because of its impact on social and economic disparities. The state has achieved a high degree of land utilization for agriculture. At present about 65% of the geographical area is under plough, high rainfall, the nature of topography and excessive pressure of population on the land are mainly responsible for such a high rate of utilization. However, the cultivable area per agricultural worker is only 0.65 acre, in the state as against 1.60 acres in India as a whole. Inspite of high rainfall and fertile alluvial soil, the crop intensity in the state is low. The uncultivable land account for 19.4 percent, excluding current fallows the total area. While forests account only 13.4 percent and current fallows 4.5 percent.

The pattern of land utilization in different districts shows in Table 1.3 that Nadia, Hooghly, Murshidabad, west Dinajpur, Malda, Midnapore, Cooch Behar and Darjeeling have more than 70 percent of their total area are under cultivation, while Purulia, Jalpaiguri, 24-parganas have less than 50 percent of their total area under cultivation and some of the districts like Burdwan, Bankura, Howrah have more than 50 percent of their land is cultivable. In respect of double cropping Nadia and
Land utilization in West Bengal (Area in Thousand Hectares)

Area not available for cultivation 19.4%
Forests 13.4%
Current fallows 4.5%
Land excluding current fallows 2.4%
Net sown area 60.3%

Fig. 1.8
Murshidabad (52 and 43 percent respectively) lead the rest of the district. For other districts this rate varies from 6 percent in Bankura to 22 percent in Malda. This regional variation is double cropping seems to be directly related to the availability of secondary means of livelihood for agricultural population and the crop yields per acre.

Double cropping is a more common practice when the secondary means are more limited and the yields rate is lower. District such as Nadia with higher rates of double cropping, have generally less of secondary means of livelihood and also lower rates of crop yield. Double cropping is very little in Burdwan, Bankura, Midnapore, where percentage are very low. Here much land is under paddy monoculture. The rice is of good quality generally and gives a good return. Double cropping has also some importance in 24-parganas and Howrah, here winter vegetable grown for supplying the urban population of Calcutta and other towns. Hooghly with its extensive rabi cultivation of potatoes has also doubled cropped area.
Land Utilization in West Bengal 1988-89 (Area in Thousand Hectares)

Table - 1.3

<table>
<thead>
<tr>
<th>District</th>
<th>%age of cultivable area to total area %</th>
<th>%age of net area sown to total cultivable area %</th>
<th>Cultivable area per agricultural worker in hectare</th>
<th>Net area sown per agricultural worker (in acre)</th>
<th>Area in thousand hectares district wise</th>
<th>Area under forest in %</th>
<th>Other uncultivated land excluding current follows %</th>
<th>Current follows in %</th>
<th>Area not available for cultivation in %</th>
<th>Net area sown in %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burdwan</td>
<td>63.34</td>
<td>96.59</td>
<td>0.60</td>
<td>0.64</td>
<td>700.55</td>
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<td>8.08</td>
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<td>0.75</td>
<td>0.74</td>
<td>454.44</td>
<td>3.52</td>
<td>8.69</td>
<td>1.70</td>
<td>12.06</td>
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<td>0.74</td>
<td>0.70</td>
<td>685.56</td>
<td>21.62</td>
<td>10.24</td>
<td>2.23</td>
<td>11.71</td>
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<td>97.67</td>
<td>0.66</td>
<td>0.65</td>
<td>1360.63</td>
<td>12.56</td>
<td>7.54</td>
<td>1.50</td>
<td>14.45</td>
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<td>0.10</td>
<td>1.26</td>
<td>0.89</td>
<td>25.14</td>
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<td>98.00</td>
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<td>0.82</td>
<td>140.18</td>
<td>29.19</td>
<td>1.26</td>
<td>0.89</td>
<td>25.14</td>
<td>43.52</td>
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</table>

Source: Economic Review of West Bengal 1991-92
has also some importance in 24-parganas and Howrah, here winter vegetable grown for supplying the urban population of Calcutta and other towns. Hooghly with its extensive rabi cultivation of potatoes has also doubled cropped area.

**Cropping Pattern and Yields**

The agriculture in West Bengal is diversified due to various reasons, and cropping pattern changes from place to place, to get maximum return from limited land to the extent as available. Various types of crops are grown in every corner in the state due to high density of population and demand of agricultural commodities, but rice is the main food crop and is grown extensively in all district. The cropped area of rice varies from 92 percent in Bankura district to 47 percent in Darjeeling district. Rice includes all the three varieties namely Aman, Aus and Boro. Aman Rice occupies the largest area in all district followed by Aus rice. Boro paddy is cultivated when supply of water is abundant and regular, because it needs intensive irrigation for cultivation. Out of the 15 districts have more than 80 percent of the cropped area under rice, are Burdwan, Birbhum, Midnapore, Howdra, Bankura, Jalpaiguri, Purulia and 24-parganas, only Jalpaiguri is located in north Bengal and the others are in south Bengal. So rice occupies the major
part of the cropped area in many southern districts in the state. Here land is fertile and favourable climatic conditions exist. Other districts of the state also produce a fair amount of rice in West Bengal.

Other crops like jute, wheat, rabi Pulses, Maize and potatoes are produced in West Bengal, but there percentage of cropped area are small compared to rice. Previously, jute was the second ranking crop in many districts here, but now it is confined to only few districts. The cropped area of wheat has been increasing year by year. Maize occupies the highest percentage of the cropped area and it is cultivable primarily in Darjeeling district in West Bengal. Jute occupies a significant proportion of the cropped area in both Cooch Behar and Jalpaiguri. Jute is the primary cash crop in the state, due to several economic problems the cropped area has been decreasing year after year. Rabi Pulses are important in Malda district. Wheat was not cultivated in West Bengal before the sixties. The percentage of cropped area under wheat increased significantly in the state specially in the districts with dry climate. But still the area under wheat is low in all the districts. Potato is another food cum cash crop yielding sizeable income
to the cultivators. Tea is the principal crops in Darjeeling Himalaya and its foot hills.

The yields rate of rice is 2090 kg per hectare in West Bengal, while it is 1741 kg per hectare in all India, because the high yielding varieties are used extensively. Yields rate of different crops are different in all the districts, due to climate edaphic and other factors. Yield rates of crops are high in the southern district, where as the yield rates low in the districts of central and northern West Bengal. As a result, concentration of crops and crop specializations vary within the state. The main reasons for the low yield rate of different crops are various, the cumulative effects of natural, economic and social factors. As far as natural factors are concerned, the occurrence of flood, uneven distribution of monsoon rain, and drought conditions adversely affects the agricultural production. The economic factors responsible for low yields, problem of supply of improve seeds, manures, fertilizers, implement, insecticides, pesticides, lack of irrigation facilities and lack of adequate and timely credit, social factors like conservatism and lack of innovativeness antiquated organizations and burdensome tenurial system etc. are the main constraint in the way of agricultural development in West Bengal.
Irrigation:

The success of agriculture is generally governed by a regulated supply of soil moisture. The provision of water at the time, it is required more important for Indian agriculture, where monsoonal rain is erratic both in time and amount of rainfall. West Bengal is generally experienced a humid climate (annual rainfall about 100 to 200 centimeters), yet paradoxically enough, the farm lands of the state require irrigation. The chief reason is the unequal seasonal distribution of rainfall, 80 percent of which is concentrated between June and September (Kharif season). The winter (Rabi) and summer seasons remaining almost dry. Further the erratic nature of the south west monsoon along with its associated floods and drought, damages the Kharif season crops. In the spatial context, the western tracts are comparatively less humid, while the southern coastal zone experiences the problems of salinity and water logging, thus restricting double and multiple cropping. Adequate and timely supply of irrigation water can partly mitigate these problems.

Irrigation plays a vital role in agricultural economy of the state. It is the most important input on which success of improved technology depends, without irrigation chemical
fertilizers can not be used with confidence and surfeit of other inputs would of a nominal. Irrigation influence agriculture in three ways. Firstly it has protective role against uncertainty of monsoon, secondly even with given technology mere provision of assumed irrigation can boost the productivity of the existing inputs and thirdly for the introduction of new technology, irrigation acts as catalytic agent and as one of the crucial factor in the package of improved inputs and new technology.

Irrigation is essential for increasing cropping intensity and productivity per unit area. Irrigation plays not only a protective role as an insurance against drought, but also pre-requisite for high-yielding varieties (HYV) cultivation. Rapid development of irrigation potential coupled with large scale adoption of modern technologies for agriculture, is therefore, of prime importance for sustained crop production.\textsuperscript{19}

In 1990-91, 2565-40 thousands hectare of minor irrigation potential had been created. Table 1.4, shows that the ground water potential created 1,401.92 thousands hectare, 1,163.48 hectare through surface water. In 1991-92 thousands hectare of irrigation potential created through major and medium irrigation. Large scale of construction of water harvesting and storage facilities have been undertaken in the
western districts to assist farmers to cope with droughts. Field bunding, surface drainage schemes and sweet water have also been undertaken in saline and drainage impeded areas.

**Irrigation in West Bengal 1990-91 (District Wise)**

**Table - 1.4**

<table>
<thead>
<tr>
<th>Districts</th>
<th>Percentage of net irrigated area to New Sown area (in Percent)</th>
<th>Irrigation by Canal (in hectare)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burdwan</td>
<td>94</td>
<td>312363</td>
</tr>
<tr>
<td>Birbhum</td>
<td>72.5</td>
<td>195991</td>
</tr>
<tr>
<td>Bankura</td>
<td>72.0</td>
<td>207437</td>
</tr>
<tr>
<td>Midnapore</td>
<td>31.03</td>
<td>177862</td>
</tr>
<tr>
<td>Howrah</td>
<td>40.21</td>
<td>4991</td>
</tr>
<tr>
<td>Hooghly</td>
<td>97.10</td>
<td>94963</td>
</tr>
<tr>
<td>24-pargana</td>
<td>22.15</td>
<td>123787</td>
</tr>
<tr>
<td>Nadia</td>
<td>40.71</td>
<td>N.A.</td>
</tr>
<tr>
<td>Murshidabad</td>
<td>33.10</td>
<td>48934</td>
</tr>
<tr>
<td>West Dinajpur</td>
<td>21.05</td>
<td>--</td>
</tr>
<tr>
<td>Maida</td>
<td>38.57</td>
<td>--</td>
</tr>
<tr>
<td>Jalpaiguri</td>
<td>11.00</td>
<td>4998</td>
</tr>
<tr>
<td>Darjeeling</td>
<td>14.14</td>
<td>647</td>
</tr>
<tr>
<td>Cooch Behar</td>
<td>12.00</td>
<td>607</td>
</tr>
<tr>
<td>Purulia</td>
<td>35.90</td>
<td>24046</td>
</tr>
</tbody>
</table>

*Source: Irrigation and water ways Directorates, West Bengal.*
There is a wide range of inter-district disparities in the development of irrigation facilities in West Bengal. Percentage of the net irrigated area to net sown area, therefore varies considerably from district to district. It is highest in Hooghly, followed by Burdwan, while it is lowest in Jalpaiguri, Cooch Behar and Darjeeling. In other districts it ranges from high to moderate.

The high percentage of net irrigated area to net sown area are in Birbhum, and Bankura district, may be attributed to the completion of the major irrigation project, like Maurakshi and Kangsabati. Besides, part of Bankura also gets the benefit of Damodar valley corporation.

Overall irrigation system of the state has to be developed, in order to increase per hectare return and ensure the maximum utilization of land. It is necessary to exploit the ground water resources in addition to existing surface resources obtained from river, canal and other sources.

**Power**

Infrastructure happens to be the pace-settler of industrial economy. Only an adequate infrastructure can ensure the industrialization and growth of economy of any region. So the power supply form one of the important locational ingredient, on
which the process of industrialization is based. West Bengal, from the economic point of view, holds a very important position in the country. About 16% of the total population live in this region, and a fair amount of Gross domestic product is contributed by the state in the national income. Major exportable item like jute goods, tea, engineering goods are predominantly produced in the state. Though the state is rich in coal and water resources, it faces seriously energy crises, which have paralized, so to say, the economic life of the people. Therefore it is worth while to study power condition in order to gauge the existing situation of the power availability and also its potential for future development. With regard to power, electricity and coal mining constitute the most important sources. Oil as a source of power is not so important, though it found recently in West Bengal in negligible amount, which cannot be used as a source of power for producing electricity. Being an industrially developed state the power shortage has affected, the pace of industrialization in West Bengal. Power shortage is not a new problem in this state. Industries are not assumed of regular supply of electricity. Load shedding are common in the densely populated areas, even in some parts of Calcutta metropolitan face the power cut continues. Jute, engineering, small scale industries, printing press are
substantially affected for the shortage of power. The state government cannot guarantee undisturbed power supply. New enterprises can not afford to bear the production loss owing to non-availability of power. The agricultural is also hard hit for non-supply of power in rural areas. Only 50% percent of villages in West Bengal is electrified. This percentage in other state are about 100 percent in Haryana and Rajasthan, Kerala, Punjab, Maharashtra Tamil Nadu and above 80 percent in Andhra Pradesh Gujrat, Himachal Pradesg and Jammu and Kashmir.

With the increase of population, expansion of industries, modernization of agriculture, the demand for power has been continuously increasing day by day. Though the installed capacity has increased fairly. The actual generation of power in power station in West Bengal varies from 30 to 50 percent of the installed capacity on the average. Hence there is a huge gap between supply and demand. The per capita power consumption in West Bengal has fallen compares to other states. In 1960-61 the per capita power consumption in this state was highest. Now the position has come down in respect of others states of India.

Another outstanding features of the situation is the striking regional imbalance that prevails in Power development,
with in the state. On the one hand, Calcutta and its industrial conurbation have attained an order of development, which is the highest in the state. The regional imbalance in the state of industrialization is reflected in the pattern and trend of generation and distribution of power between the district.

Table 1.5, shows that there is marked regional variation occur in the consumption of electricity. While the district of Burdwan, Hooghly, Calcutta, consumed high amount of electricity due to its marked progress in industrialization, on the other hand most of district. The district lagging far behind in the consumption of power.

### District Wise Consumption of Electricity in West Bengal (in million KWH)

<table>
<thead>
<tr>
<th>Name of Districts</th>
<th>Year 1982-83</th>
<th>1990-91</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bankura</td>
<td>21.7</td>
<td>65.9</td>
</tr>
<tr>
<td>Birbhum</td>
<td>44.1</td>
<td>98.9</td>
</tr>
<tr>
<td>Burdwan</td>
<td>1515.0</td>
<td>1751.3</td>
</tr>
<tr>
<td>Cooch Behar</td>
<td>6.4</td>
<td>63.9</td>
</tr>
<tr>
<td>Darjeeling</td>
<td>58.0</td>
<td>124.5</td>
</tr>
<tr>
<td>Jalpaiguri</td>
<td>41.3</td>
<td>84.9</td>
</tr>
<tr>
<td>Malda</td>
<td>17.0</td>
<td>69.1</td>
</tr>
<tr>
<td>Midnapore</td>
<td>253.9</td>
<td>397.0</td>
</tr>
<tr>
<td>Murshidabad</td>
<td>45.7</td>
<td>134.4</td>
</tr>
<tr>
<td>Nadai</td>
<td>172.3</td>
<td>303.9</td>
</tr>
<tr>
<td>Purulia</td>
<td>70.3</td>
<td>87.7</td>
</tr>
<tr>
<td>West Dinajpur</td>
<td>10.4</td>
<td>50.8</td>
</tr>
<tr>
<td>Howrah</td>
<td>135.2</td>
<td>NA</td>
</tr>
<tr>
<td>Hooghly</td>
<td>533.6</td>
<td>5531.7</td>
</tr>
<tr>
<td>24-pargana</td>
<td>414.2</td>
<td>NA</td>
</tr>
<tr>
<td>Calcutta</td>
<td>2872.0</td>
<td>NA</td>
</tr>
</tbody>
</table>

**Source:**
(i) West Bengal State Electricity (ii) Calcutta Electric Supply Corporation.
Few districts have moderate amounts of power consumptions. The district lagging behind in power consumption are industrially and agriculturally backward regions.

Table 1.6, shows that energisation of village over the district, indicate that there were ten (10) district with the percentage of energisation lying between 91 and 100 percent. In the three districts of Purulia, Bankura and Midnapur, energisation is less due to the problems of access through forests and the difficult nature of terrain. The percentage of energisation remain below the average for the state as a whole. For the rest of the three districts Darjeeling, West Dinajpur, 24-parganas (N & S) the percentage is greatest than the state average. Progress is slow in these districts, because population are located over dispersed area and there is difficulties in access to the villages. The growth of consumers is also marked in the state very highly, while it was 1,293,300 in the year 1981, and now it is more than 27 lakhs (2707655) in the year 1991-92. There has been a marked increase in load from industry and agriculture. Boro rice cultivation now is being increasingly dependent on energisation of pump sets. There is a surge on demand during the period of boro cultivation.
Rural village electrification district wise in West Bengal

(1991-92)

Table - 1.6

<table>
<thead>
<tr>
<th>Name of the District</th>
<th>Total no. of villages</th>
<th>Total no. Village electrified</th>
<th>Percentage of electrified villages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bankura</td>
<td>3540</td>
<td>2137</td>
<td>60.37</td>
</tr>
<tr>
<td>Birbhum</td>
<td>2229</td>
<td>2217</td>
<td>99.28</td>
</tr>
<tr>
<td>Burdwan</td>
<td>2570</td>
<td>2401</td>
<td>93.42</td>
</tr>
<tr>
<td>Cooch Behar</td>
<td>1139</td>
<td>1118</td>
<td>98.16</td>
</tr>
<tr>
<td>Darjeeling</td>
<td>659</td>
<td>499</td>
<td>75.72</td>
</tr>
<tr>
<td>Jalpaiguri</td>
<td>736</td>
<td>725</td>
<td>98.51</td>
</tr>
<tr>
<td>Hooghly</td>
<td>1899</td>
<td>1874</td>
<td>98.68</td>
</tr>
<tr>
<td>Howrah</td>
<td>755</td>
<td>755</td>
<td>100.00</td>
</tr>
<tr>
<td>Malda</td>
<td>1615</td>
<td>1596</td>
<td>98.82</td>
</tr>
<tr>
<td>Midnapore</td>
<td>10468</td>
<td>4717</td>
<td>45.06</td>
</tr>
<tr>
<td>Murshidabad</td>
<td>1927</td>
<td>1779</td>
<td>92.32</td>
</tr>
<tr>
<td>Nadia</td>
<td>1255</td>
<td>1254</td>
<td>99.92</td>
</tr>
<tr>
<td>24-pargana</td>
<td>3744</td>
<td>3207</td>
<td>85.23</td>
</tr>
<tr>
<td>Purulia</td>
<td>2452</td>
<td>1376</td>
<td>56.12</td>
</tr>
<tr>
<td>West Dinajpur</td>
<td>3036</td>
<td>2367</td>
<td>77.96</td>
</tr>
<tr>
<td><strong>Total West Bengal</strong></td>
<td><strong>38024</strong></td>
<td><strong>28020</strong></td>
<td><strong>73.69</strong></td>
</tr>
</tbody>
</table>

Source: Department of Power, Government of West Bengal and WBSEB
In West Bengal, there is practically, no hydro-electricity. The installed capacity of the Hydro-Projects in the state is not more than 2 percent of the total installed capacity against 30 to 40 percent in many states. The experts have suggested that the water of North and South Bengal can be utilized for power generation up to 1000 MW. Without its proper and adequate supply the state cannot continue the pace of development with rest of the country.

TRANSPORT AND COMMUNICATION

The importance of transport and communication in the economic development and prosperity of any region can hardly be overemphasized. Development of cheap and efficient means of transport and communication is necessary for the progress of the regions. It reflects the economic advancement, social conditions and political setup of an area. It not only ensures the movement of the people and materials but also the movement of ideas and skill from region to the other. Easy accessibility to different part of the region is very important factor in its overall development. The communication systems of West Bengal includes railways, roadways, water ways and air ways etc. The total length of railway lines in the state is about 3767 kms Eastern and South Eastern railway headquarters are
in Calcutta. The area of high density of railway lines are the lower Damodar valley, and lower Ganga plain region. Concentration of railways in these regions due to rich mineral deposits and industrial complexes and the level topography and large population and also the Calcutta mega-politan city. The hill district of West Bengal, the presence of many physical constraints could not developed the good railways network in the district of Darjeeling, Jalpaiguri and Cooch Behar. The region lack in transport and communication facilities. The western district of Purulia and Bankura also have not well connected with railways.

The network of roads in the state is much thicker, having surfaced road 25984 kms and un-surfaced – 32016 km and National highways about 1631 km. The role played by inland waterways in transportation system is of not great importance as compared to railways and roadways. River and canal which are navigable throughout the year is River Ganga. Major port of the West Bengal are Calcutta and Haldia have international importance and cover a huge hinterland. Bengal has one International Airport in Calcutta and a domestic airport at Bagdogna, while many other aerodrome at the local level are exists.
Industrial Development

At the time of independence, West Bengal was the most industrially developed state in India. Calcutta was, so to say, the industrial capital of the country. Now West Bengal said to be one of the backward state in India. Everywhere the declining trend of the economy of West Bengal. Infact the economy of this state did never in the post independence era, suffer such a break down as it did in those years. The state has lost its glorious position in the industrial map of the country. In the post independence period, the reduction of regional disparities has been one of the major objectives of planned development and a number of measures was adopted with a view to achieving it. Besides, a degree of preference to the less development areas in the matter of selection of the location for the central industrial projects, the equalization of steel prices and subsidizing coal prices for the areas remote from the coalfields as well as the rapid growth of electricity generation capacity in new areas have actively helped the process of wider dispersal of industries added to the above, the clogging of the part of Calcutta, and the deterioration of other infrastructure services have tended to militate against a high rate of growth in West Bengal. Indeed a sharp deterioration of industrial relations and in the law and order situation have given rise to a
process of plight of enterprise from the state in recent years.
The second important thing is that the industrial sluggishness
in the state is the result of the general macro-economic profile
of the country as a whole and the industrial policies followed by
the central government. The central investment are also made
keeping in view the political viability of the project. The state
inspite of enjoying certain natural and topographical privileges,
has become, the worst sufferer.

Figure 1.9, shows the industrial regions of the state. The
role of central investment is very vital and significant for
infrastructural development. Here also West Bengal is a victim
of gross injustices. This state had been deprived since
independence. No sincere efforts however was made for
modernizing railway's, defence and communication systems,
river and ports. also poor conditions of Indian Iron and steel
company Ltd (IISCO), is now being hatched. instead of
modernizing. The only remarkable investment made in the state
were the Metro Railway, Durgapur Steel and the partial
modernization of the airport. This unfavorable attitude also
shows that the union government step-motherly treatment for
the state, while in Maharashtra the central investment in
public sector stood Rs. 23,850.90 crore in 1990-91, while in

80
FIG. 1.9

WEST BENGAL
INDUSTRIAL

BANGLADESH

INDUSTRIAL
STATE CAPITAL
West Bengal it is only Rs. 8744.33 crore in the same year. The rate of central investment, which was 8.2 percent in 1981 in the state, comedown to 7 percent in 1991, comparably in Maharashtra the same has been increased from 8.6 percent in 1981 to 16.3 percent in 1991. In 1951, West Bengal had the highest number registered factories – 1493, she was followed by the composite state of Madras (roughly Tamil Nadu and Andhra Pradesh) with 1473 factories and Bombay (Maharashtra and Gujrat) with 1426 factories. The number of persons employed in factories in that year was 475,084 in West Bengal, 537,906 in Bombay and 180,629 in Madras. In the year 1950-51, the industrial production of the state was about 25 percent of the total industrial production of the country.

Many other factors also responsible for the slow growth of industry in the state, such as Trade unionism movement, and the left front government's hard hit policy towards the business and industrialist community also have great impact on it.

In view of regional difference of industrialization and the number of workers employed in these industries also shows a great deal of regional imbalances or inter-district disparities in the development of the industries. Few districts like Howrah, Calcutta, 24-parganas and Burdwan have huge number of
working factories and number of persons employed in these factories are very high in respect of other districts.

Table 1.7 shows the clear picture of the regional variation in industrial development. While few districts are very backward, like Malda, Murshidabad, Purulia, Cooch Behar and west Dinajpore have negligible units of industries in these districts.

**Working factories and number of workers employed**

<table>
<thead>
<tr>
<th>District</th>
<th>Unit 1980</th>
<th>Employment in working factories</th>
<th>Unit 1990-91</th>
<th>Employment in working factories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bankura</td>
<td>76</td>
<td>1663</td>
<td>80</td>
<td>1775</td>
</tr>
<tr>
<td>Birbhum</td>
<td>91</td>
<td>3381</td>
<td>97</td>
<td>4106</td>
</tr>
<tr>
<td>Burdwan</td>
<td>477</td>
<td>114083</td>
<td>517</td>
<td>12563</td>
</tr>
<tr>
<td>Calcutta</td>
<td>782</td>
<td>18151</td>
<td>828</td>
<td>18683</td>
</tr>
<tr>
<td>Cooch Behar</td>
<td>18</td>
<td>772</td>
<td>19</td>
<td>933</td>
</tr>
<tr>
<td>Darjeeling</td>
<td>190</td>
<td>10280</td>
<td>211</td>
<td>10355</td>
</tr>
<tr>
<td>Hooghly</td>
<td>290</td>
<td>105621</td>
<td>1903</td>
<td>100264</td>
</tr>
<tr>
<td>Howrah</td>
<td>1774</td>
<td>156852</td>
<td>1963</td>
<td>151627</td>
</tr>
<tr>
<td>Jalpaiguri</td>
<td>312</td>
<td>20594</td>
<td>340</td>
<td>19992</td>
</tr>
<tr>
<td>Malda</td>
<td>12</td>
<td>341</td>
<td>21</td>
<td>759</td>
</tr>
<tr>
<td>Midnapore</td>
<td>126</td>
<td>22549</td>
<td>150</td>
<td>23422</td>
</tr>
<tr>
<td>Murshidabad</td>
<td>15</td>
<td>1603</td>
<td>20</td>
<td>3470</td>
</tr>
<tr>
<td>Nadia</td>
<td>128</td>
<td>12948</td>
<td>140</td>
<td>12391</td>
</tr>
<tr>
<td>Purulia</td>
<td>49</td>
<td>4793</td>
<td>54</td>
<td>4399</td>
</tr>
<tr>
<td>24-parganas</td>
<td>3,684</td>
<td>425306</td>
<td>4195</td>
<td>401065</td>
</tr>
<tr>
<td>West Dinajpore</td>
<td>34</td>
<td>1853</td>
<td>39</td>
<td>2672</td>
</tr>
<tr>
<td>West Bengal</td>
<td>8064</td>
<td>900790</td>
<td>8960</td>
<td>881448</td>
</tr>
</tbody>
</table>

**Source:** Economic Review of West Bengal 1991-92
Urbanization

The term urbanization has acquired a definite development connotation in the context of economic planning. The rural-urban migration stream, which constitute the essential instrumentality of the process of urbanization, is looked upon as a horizontal response to the intersectional transfer of population from the primary to the secondary and tertiary sectors. It is urbanization, which proceeds on the basis of establishment expansion, and diversification of economic activities at central places and in urban settlements. The process of urbanization is generally taken as the result of the process of industrialization. Difference in degree of development are attributed to the reflection of disparities in the degree of urbanization and industrialization, among the regions concerned. The facts that world’s developed countries are highly urbanized and industrialized may safely justify the validity of the deduction that the urbanization and industrialization constitute the indices of economic development. Actually urbanization is the process by which simple village turn into towns and towns developed into cities with a complex web of function. Being the total reflection of its urban growth expresses not only the time-dependent
phenomenon, but also reveals the attitude of the ever-growing hierarchical system. West Bengal shows a changing pattern of urban growth over decades. The Table 1.8 shows the clear picture about the decadal growth of urban population in the state from 1961 to 1991.

**Urban Population Growth in West Bengal, percentage of urban population to total population since (1961-1991)**

Table - 1.8

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Burdwan</td>
<td>18.20</td>
<td>22.78</td>
<td>29.39</td>
<td>35.43</td>
</tr>
<tr>
<td>Birbhum</td>
<td>6.97</td>
<td>7.03</td>
<td>8.28</td>
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*Source: Census of India 1991.*
After partition in 1947, the type of changes that have taken place in the state of West Bengal can hardly be compared to any other area of India. Partition of Bengal had mainly affected her urban areas as millions of refugees settled in the urban centre in and around in West Bengal. Also people migrated from different states of India especially from Bihar, UP, and Orissa and rural folk of native state in to the Urban areas, as industrialization progressed. Calcutta the only metropolitan city in the Eastern India and the gateway of commercial activities, almost everybody had attempted to have an access to this metropolitan city and its suburb especially for search of jobs. In the southern Bengal, especially in the western section of region, there have been urban growth mainly because of industrialization and mining activities. The urban areas of Burmpur, Kulti, Durgapur, Chitranjan, Raniganj, Jamuria and Haldia. In the North Bengal, the urbanization has not progressed in the same way as it was in the south Bengal, Owing to have hilly inaccessible terrain. Still some of the urban centers which have importance of strategic location like Silliguri become more important has attained new heights in term of growth. The other important urban centre is Darjeeling. The areas, whose growth rate has declined, because they have been isolated after partition of Bengal, for example, Balughat,
Hilli Jalpaiguri and smaller area of Cooch Behar district. During last two decades the urban population of the state has witnessed a rapid increase. In 1971, the urban population was 109.67 lakhs, which became 144.47 lakhs in 1981 and it gone up to 186.22 lakh in 1991. This increase in urban population, in almost all the urban centres are not due to high rate of natural growth, rather mass migration of people from rural areas to urban centre. The total numbers of towns in the state in 1980 was 289 out of them there were 22 class one cities, 40 were class second towns and 52 class third towns and 92,62, 20 were respectively class Fourth, fifth Sixth urban centres in the state. Most of the people live in IInd and IIId, IVth and Vth class of towns. As far the growth of urban population in class I cities are concerned their rapid increase in urban areas are due to the rapid industrialization and new opening in every sectors of the economy. In the case of IInd and rest of the lower classes of town the increase of population is very slow, mainly due to lack of infrastructural facilities for the development.

Urbanization is taking place every where in Bengal. Figure 1.10, describe the regions which have high, medium and low percentage of urban population. The degree varies from region to region, due to varying geo-economic conditions.
During 1981-91 the most rapid growth rate was registered in Burdwan, and North-24-pargana districts largely due to the industrialization and other infrastructural facilities. While few district like, Purulia, Cooch Behar, Malda, Birbhum, Bankura and West Dinajpore, have witness very low growth rate of urban population, because of their dominant agricultural base of economy. More than 75 percent of people in these districts are engaged in primary occupation and other district witnessed moderate increase of urban population. In future some changes are expected to take place from the past trend. and future urban growth will depend on location of industries into towns and cities, depending on economic opportunities.

The Haldia project in southern Midnapore bring the new era for the people of this region. Kolaghat power plant, Bundil and Tarakshwar Power will bring additional changes in the economy of this region. With the completion of Farakka project, the growth in North Bengal will get a boost in these area's like Farrakka, Maldah, Raiganj, Islampur, Balughat etc. While the future of Asansol, Durgapur, industrial belt is very bright, and bring prosperity not only to this region, but also for the whole of the state of West Bengal.
References


3) Bose S.C, Geography of West Bengal National Book Trust, India p. 6, 1968.


7) Bose, S.C. Geography of West Bengal op.cit., p. 12.


14) Bose, S.C., Geography of West Bengal op. cit., 16-20.


CHAPTER 2

REVIEW OF LITERATURE
CHAPTER 2

REVIEW OF LITERATURE

Work on regional disparities have generated a considerable amount of interest particularly after the realization of the influence of regional factor in development. A large number of studies have been done in this field, and attempts have been replicated at the national level, state level and lower level. There is also a shift from over all development to Sectoral and micro-Sectoral studies. Earlier attempts to measure regional disparities emphasized on the final outcome and per capita income was used as the sole indicator of the level of development, development was then perceived in terms of economic growth. Later on, however development was treated as a broad based concept that incorporated changes in other spheres of human life. This has necessiated the use of a large number of indicators to different facets while determining relative development. So, there is a need to conduct such work on regional disparity in India, which covers all aspects, of socio-economic condition of the people and gives a fruitful result in this regard.
Sen Gupta and Sadasyuk (1961) have worked out the economic regionalisation of India, in an attempt, to provide a hierarchy of regions. useful in national planning.

Schwartzberg (1962) attempted to regionalize socio-economic development, of India. The use of a composite index of development brought out areal differences in levels of development, although these differences could not be further put to rigorous regional analysis. as the data were on the basis of states (Prior to 1956), which are not ideally suited to reveal regional differences.

Pal (1965) made a more systematic attempt in the construction of a composite index of selected variables which permit several stages of analysis in relation to the group of variables contributing to overall development. with a study of all India Level, it may be regarded essentially as a contribution to methodology in areal differentiation by factor analysis. In order to be of good use, in policy decision, these studies need to incorporate some of the important factors like per capita income and production which are directly related to the levels of development.
Mitra (1965) using a somewhat different method, has grouped 324 districts of India into four levels of development. For this study he selected 63 variables and these were grouped into six convenient blocks. These variables pertain to natural factors, agricultural, infrastructural, traditional economy, human resources, organised industries, etc. This study is unique for its simplicity and systematic approach. Nevertheless, the author himself pointed out in his introductory remarks that, the lack of more important indices and methods of giving importance to different variables is a hindrance to this study. The data in per capita income is difficult to calculate below the state level.

Bose (1968) discussed the problem of poverty in India, and its extent in different stages of economic development at district level in West Bengal. He pointed out the extent of income loss is likely to be increased at least in the initial years in backward districts due to the division of investment of resources.

Sen (1968), pointed out that the problem of disparities are found not only in India but other countries of the world also. The effort of development in backward countries is mostly concerned with raising the per capita income, and the
rate of income growth in the nation as a whole through the professional allocation of resources among backward regional sector. National development itself further accentuates the problem of income disparity not only between rich and the poor, but also between the slightly more developed and the less developed regions, which has been recognised.

Nath (1970) on the basis of the state and district level data worked out the regional patterns of economic development and economic growth within India. Analysis of the level of economic development has been made for both states and districts, but analysis of growth rates has been only for the states. The level of economic development of states have been measured in two ways: (i) on the basis of per capita income, and (ii) through the use of composite index of economic development based on four indicators. Analysis of the economic growth has been made with the data of growth rates of population, agricultural output, per capita value added in industry, and per capita income. He mapped the states of India into two categories, relatively developed and less developed.

Nair (1971) has emphasized empirical validity of the hypothesis that as income of a nation increases, inter regional differences in income between the region of the nation
automatically diminishes. In his analysis, he used three measures, the quotient of disparity, the weighted co-efficient and the state income relatives. He reached to the conclusion that a reduction in inter-regional income differentials, such as policy, consist not only for allocating projects to states on the basis of regional pressures but in developing local or regional industries, social overheads and small towns as growth centers. The Bengal Chamber of Commerce and Industry (1971) surveyed the socio-economic condition of West Bengal and found a high level of intra-state disparities in it. The inter-district disparities are widely found in Calcutta and Burdwan, which are industrially developed, possess huge amount of coal and iron-ore deposits, while the other district are very poor and reflect a sorry plight of stagnation and decay. Survey shows a greater degree of intra-state regional imbalances that are not witnessed in any other state of the Indian Union.

Verma (1972) taking per capita income as an indicator of development, analysed time series of regional disparity in per-capita production during 1949-50 to 1967-68 in Pakistan. He used the methodology of fitted equation in his analysis.
Brown (1972) discussed short term, medium term and long term consideration of planning for the United Kingdom. Inter-regional differences in UK are smaller in comparison to those in most other countries. He considered regional and social accounts to form a clear impression of the economic performances and inter-relations within the regions. The purpose of Brown's study is not to prescribe measures of policy for hypothetical situations but rather to analyse the regional problem and setting within which regional policies have to be considered.

Koropeckyj (1972) unravelling the regional experiences of non-socialistic and socialist countries. Both are facing the problem of regional disparity due to some reasons. Developed countries also face the problem of ghettos and lagging regions. Even in the long run economic development at the national level, unable to solve the problem of regional disparities.

Mathur (1973) used the hypothesis, that an appreciation of the imperial wideness is the extent of the problem of inter-regional differences in India. A kind of spatial Sectoral frame, is as important as the understanding of theoretical issues that are involved in the problem of inter-regional disparities.
Rao and Sundaram (1973)\textsuperscript{13}, their study is primarily oriented towards a decision of the normative issues of policy, intervention and planning by examining critically the past efforts, their pitfalls, gaps, and inadequacies and certain alternative approaches and measures for the foregoing new techniques and instruments towards the integrated approach of development.

Sharma and Katiyar (1974)\textsuperscript{14} Stressed on the need to develop a synthesis of index of development rather than a single index of a specific variable, because it does not give an over all picture. They develop certain indices and used the composite index method to determine the level of development of Uttar Pradesh.

Peet (1975)\textsuperscript{15} examined two concepts. The Marxist approach that inequality and poverty are inevitably produced by capitalist societies and the social geographic ideas that inequality may be passed on from one generation to the next via the environment of opportunities and services in which each individual is implanted at the time of birth. He gave powerful theoretical explanations of the origin of inequality with some empirically devoid generalization. Who is poor and exactly how inequality persists, under the condition of “advanced” capitalism. He concluded that change in the
system is the result of change in the demand for labour. Continuing poverty in American cities is the end product of continued system that needs to produce and reproduce industrial reserve army. Inequality and poverty can not be eradicated without fundamental change in the mode of production.

Knox (1975) explored the concept and techniques so far, developed in establishing social indicators and applied them in describing spatial variations in the social well-being of the people of England and Wales, he described the utility of development of social indicators and measurement of spatial variation of well-being and the problems involved.

Ganguli (1975) studied inequality in India through two basic things (i) the inequalities are inherent in the socio-economic structure of India and (ii) the colonial rule created a new kind of inequalities in society specially for economic progress. He also argued that inequality is inherent in India.

Andrew and Withey (1976) surveyed the concepts and methodology that might be applied for the development of a large number of perceptual indicators for the well-being of American population, both as a whole and as disaggregated by demographic and socio-economic parameters. They
identified more than a hundred areas of life that are concerned and derived from nearly seventy measures of global well-being. They also studied the Psychological aspects of the problem and variations within population.

Nair (1977)\textsuperscript{19} using rank correlation technique, studied regional disparities in industrial wages in India. His study reveals that, wages in organized industrial sector have been very low in the states of Jammu and Kashmir and Andhra Pradesh, while the reverse is the case with Bihar and Maharashtra. The states of Karnataka, Orissa and Madhya Pradesh seem to be improving their position but the situation in Assam and Punjab is dismal. But the relative position of the states do not seem to undergo major changes during the period while there are some signs of decline in disparities.

Sampth (1977)\textsuperscript{20} using similar measure of the coefficient variation and studied inter-state inequality in income during 1951-71. He measured inequalities at three levels, at the regional net domestic income, at the level of Sectoral income, and other levels of regional per capita income. He prepared the index of economic performance in order to show the relative positions of the states.
Smith (1977) emphasized the well-being trend of human geography by considering the casual relationship between inequality, spatial organization of society and society structure. He has examined inequalities in America and South Africa. He has also shown the structure and norms underlying in the prevalent inequality. Distribution and social justice criteria are not proper. He also explained how planning machineries can be used for spatial reorganizations and redistribution.

Coates (1977) surveyed on spatial variations of social well-being. He shows some areas that provide their inhabitant with good quality of life than other areas. He discussed the concept of quality of life, well-being and needs as well as problems involved in measuring them. He found inequalities at three levels, the national, the intra national and the inter-urban. He has stressed on existing policies for the removal of inequalities in social well-being and has given suggestions to reduce the inequalities.

Prakash (1977) assessed the regional inequalities and economic development in relation to infrastructural facilities in India. He selected several infrastructural factors, various characteristics of population that reflects the development of
infrastructure; the determinants of Industrialisation; the
development of power, irrigation and agricultural implements;
and road transportation, communication and banking
services. He got two important conclusion from the analysis of
development of individual regions in various fields.

Maclaran (1978) studied the concept of human well-
being among the geographers and proposed a great change
which has affected the manner of its development. A brief
study was made on social indicators and some problems were
encountered in their use.

Prakash and Rajan (1979) using Gini coefficient,
measured the degree of concentration of agricultural inputs
and agricultural development. They reached on the
conclusion that agricultural productivity per hectare is widely
used but agricultural inputs like iron plough, tractors,
fertilizers, HYV seeds, irrigation, etc. are highly concentrated.
There are hardly any region which is not totally
underdeveloped or developed.

Khosla (1979) deals with the particular aspects of the
problem of regional disparities in India. He examined the
mode of change of inter-regional disparities in wages, in-
organized manufacturing industry in India between the years
1961 and 1969, and attempted to examine the possible cause for such a change by splitting them into two-structure of industry and region specific factors.

Ajit (1979)\textsuperscript{27} analyzed the trend in inter-regional and inter districts income differentials in Uttar Pradesh over the period 1951-71. His study revealed that per-capita income of western Uttar Pradesh is higher than Eastern Uttar Pradesh.

Tilak (1979)\textsuperscript{28} has constructed indices of educational development for the different states of India for the year 1974-75 and suggests possible causes and hence the solutions for the removal of these disparities.

Bhatia (1979)\textsuperscript{29} wrote on regional disparities in agricultural income and productivity in which after providing evidence for the existence of such disparities and enquiring the possible causes for these, a plea is made for their reduction by appropriate policy measures.

Kump (1979)\textsuperscript{30} tries to examine the question as to whether the major commercial banks in India have been developing in a regionally balanced manner since 1969, and the year when they were nationalized. One objective of nationalization was the removal of regional disparities by the
development of commercial banking and availability of housing facilities through bank credit.

Bhatia (1979) examines the role of Finance Commission in reducing regional disparities has analysed, both in the context of the constitutional provisions and the actual working of the commission. It is contended that our constitution has provided the Center and the Finance Commission with adequate powers to works towards a reduction in regional disparities.

Mishra and Gaikward (1979) surveyed the impacts of economic development on the welfare and living conditions of people in Madhya Pradesh. He selected important indicators of social welfare, the sectoral composite index of development has been formulated, based on the principle component analysis method. He arrived at a conclusion that the agricultural development is not sufficient for the benefits of different section of people that causes disparities among the social welfare. Industrial development may play a crucial role of positive effect but Industrialisation should not be specific.

Hansen (1980) criticized Marxist regional analysis, focussed one side on the localization of capital and labour and neglected the human and environmental constituents of
the capital movement. Therefore, he outlines the localization analysis and also an analysis of regional differences in labours’ working and reproduction condition. He discussed how these differences and localization of capital influence each other.

Echols (1980) suggested that both the coefficient of variation and co-relation of co-efficient should be used while analysing the data on the level of socio-economic development.

Bodemann et al (1980) made a reappraisal of the concept that, primitive accumulation is a key factor to the understanding of dependency of backwardness at local level. They outlined three phases in the destruction of pre-capitalist formation by capitalism. These are separation of production from traditional bonds and hierarchies, introduction of commodity economy and separation of handicraft from agriculture and the separation of producer from the means of production.

Nechemis (1980) studies social welfare with the help of some indicators in 57 provinces of former USSR. The indicators selected were hospital beds and doctor per 10,000 population, schools per 1000, population, housing spaces
and retail trade per capita, degree of urbanization and population of the provinces. The broad finding of his study is the reduction in regional imbalances have occurred but these are linked with the spread of urbanization.

Siddiqi (1980)\textsuperscript{37} studied the impact of Pakistan's developmental policies on regional development by employing multivariate statistical technique of analysis.

Bahadur and Ahmad (1981)\textsuperscript{38} explains the various causes of inequalities of higher education in India, which shows that education in India is highly in favour of higher order urban centers. The main reason for it, due to the uneven economic development and different nature of society, which makes the problem of educational backwardness of the country more acute. They also found inequalities of higher education with respect to enrollment and population between rural areas and urban centers in almost all Indian universities. However, the degree of inequalities differ from university to university. They suggested some good ideas, dispersion of new colleges on the principle of locational analysis etc.
Dadibhavi (1982) examines the identity relatively more or less developed Talukas in Karnataka state as compared to an average state level of development in terms of several indicators. His study is based on composite development index derived from principal component analysis to the conclusion that the growth pole strategies had stimulated very little development in the backward areas, especially agricultural development. He emphasized that there is a need to develop new planning strategies for the betterment of Pakistan's backward regions.

Moragan and Sayer (1983) reveals that the process of uneven development are derived from specific characteristics of capitalism. He related the process with British economy especially of South Wales.

Banerjee (1984) in his article “changing cultural scenario and economic development of India” mainly emphasizes the efforts to achieve economic development. India is facing the problem of massive population growth, rapid depletion of resources, growing disparities between the urban and rural areas as well as regional and social disparities within the country. Dimensions of these problems and their impact on the cultural scenario is important.
Saur (1984) selected and evaluated certain developmental indicators to measure regional disparities in the state of Orissa with the application of factor analysis and shows how disparities in the process of development occurred among different regions.

Parmar (1985) highlights the inter-regional imbalances which causing bottleneck in development process. He examines the relative levels of development with the help of inter-sectoral analysis of each district of Saurashtra region, and tries to get the reasons behind the inter-regional imbalances.

Bronger (1986) measured levels of development in terms of 36 indicators in Andhra Pradesh taking districts as unit of the study. He applied factor analysis in identifying backward and developed regions as well as investigating dimensions and dynamics of development in the state.

Srivastava (1987) in his article, "remove regional imbalances", tries to emphasize that a country of such a large size as India disintegrative tension often builds up due to economic and social disabilities and regional imbalances. His view in this regard that we have got our independence but it is going to take a longer time further to achieve Indian
Nationalism. According to him, the conflict between the center and the state is nothing new, but it should not stand in the way of nation integration.

Burney (1987) has laid a considerable stress on the proper and non-communal interpretation of history. In his view through sloth and inertia distortion of history continues. He thinks that decisive forces have to be taken by leading a strong attack on economic disparities which have a crippling effect on human society that breeds social evils.

Shankaraiah and Khan (1987) advocate the Nehruvian concept of regional development for achieving the objective of overall economic development. Realizing the need for reducing regional disparities, Nehru laid emphasis on ‘social justice’ i.e. all citizen be treated alike and given equal opportunities in life. This can be only achieved when inter-regional disparities in the levels of development were overcome.

Dadibhavi (1989) measured regional disparities in terms of net domestic product at factor cost at three points of time: 1960-61, 1970-71, and 1975-76 in Karnataka. He took district as a unit of analysis. His study reveals that there is wide variation in the level of development during 1960-61
and 1975-76. Inequality reduced marginally but the ranking of the districts remains same. Variation in active participation and the degree of industrialization have increased but there has been a decline in respect of effective work participation rate, labour productivity, degree of organization, literacy rate, and composite index of infrastructure, indicates that effective participation and productivity are the only significant variables to inter districts variation in Karnataka.

Banerjee (1992)\textsuperscript{49} in his article Disparities in Development of Socio-economic Infrastructure in rural areas of selected district of Uttar Pradesh, says that diversity in the Sectoral development of different blocks is the main factor responsible for the disparity in the overall development in rural areas.
References


7. Nath, V., Levels of Economic development and Rates of Economic Growth in India – A Regional Analysis, The


27. Missing


44. Bronger, D. Regional Disparities as a problem of spatial development planning in countries of Third World case of India with reference of Andhra Pradesh. Annls of the National Association of Geographer India, Vol. 6, No. 1.


CHAPTER 3

CONCEPTUAL AND METHODOLOGICAL FRAMEWORK
CONCEPTUAL AND METHODOLOGICAL FRAMEWORK

(A) Concept of Indicators

The standard dictionaries defined the term “Indicators” as one that indicates, shows, Point out or Pin-point. However, the term has obviously a wider sense than its literal meaning. This term has long been used by statisticians. In view of The Report of the Joint Meeting of Planners and Statisticians', the term indicator commonly used in statistical circles with reference to derived figures, such as averages, proportions, ratio, Index number and other synthetic measures of an analytical characters. The transformation of raw data into synthetic function is to eliminate the influence of population on any characteristics. Therefore, it is through an appropriate transformation of variable (which eliminates the effect on non-essential factors) within a theoretical format that an indicator can be formulated.

The use of the term in statistical literature does not mean that indicators are simply statistics and statistics are not ‘ipso-facto’ indicators unless theory or assumption makes
them, so by relating the indicator variable as a phenomena. That is what it directly or fully measures.¹

Raymond A. Bauer, a main proponents of the Social Indicator movement defined it as statistics, statistical series and other forms of evidence that enables us to assess where we stand, and are going with respect to our values and goals, and to evaluate specific programmes and deter their impact². While in view of Martin Kartzman, it indicates the measurement of social phenomenon whose movements indicate whether a particular problem is getting better or worse relative to same goals. Without attempting a precise definition of the term, social indicators have been described as constructs, based on observations and usually quantitative, which tell us something about an aspect of social life in which we are interested or about changes that are taking place in it.

However, indicator is considered synonym with variable and index number but a careful observation may distinguish the two. Jager while separating the two connotation said that "perhaps some variable should be treated as indicators and other should not for it, all variable were called indicators,
there would be no need of an additional term. The distinction between an indicator and a variable are noted here. Indicators are generally expressed in terms of relative, numbers while a variable in absolute numbers. Indicators make a general comment, while variable make specific comment. An indicator is composite of at least two variables, while a variable is a single entity. An indicator viewed as a combination of matters of fact (data) and matters of relation (theory), on the other hand, can be constructed only through a correct sequence between factual and logical orders. It is therefore, through an appropriate transformation of the variables within a theoretical format that an indicator can be obtained.²

Stuart Rice defined the social and economic indicators as social indicators are needed to find pathways through the maze of society’s interconnections.³ To delineate social states defined social problems and trace social trends, which by social engineering may hopefully be guided towards social goals or any objective formulated by social planning. Whereas, the aim of economic indicators according to economists is the measurement of levels of living purely fiscal terms. the social geographers has a leaning towards the welfare approach of economic factors.
A review of the above discussions leads to a generic definition that socio-economic indicators are statistical measures which gives information regarding socio-economic conditions and changes therein over times for various segment of society. By social condition, we mean both external (social and physical) and internal (subjective and perceptional) context of human existence. They are basis of information for planners, researchers and decision makers, because most of the programmes and policies are formulated and implemented in the light of information gained from indicators and thus help in achieving targets of planning. These goals may be identifications of backward regions and regional development and improvement of social economic conditions, e.g., to improve the level of living of people below poverty line in backward and forward regions etc. In the present context the role of socio-economic indicators become very crucial, because they help in serving two basic purposes: First they help in crystalising the goals of development planning in terms of specific objectives or targets and second they help in measuring the progress made towards the goal in relation to the target fixed. Besides, they also serve as a variety of other
purposes like analysis of current situation of development, formulation of development policies, which can possibly served by making judicially use of these indicators, comprise analysis of main facets of well being of population, portrayed the state and trend in socio-economic conditions; which are likely to become the subject of public concern, crystalisation of the goals of development planning in terms of specific objectives, assessment of distribution of well being, and its role as a critical variables in building development models.

Thus, one finds that socio-economic indicators can play pivotal role in development planning in two ways. Firstly they can help in analysing the pre-plan socio-economic conditions and secondly, they can assist in monitoring progress towards development goals, and providing information which facilitate formulation of policy and programmes and selection of priority areas.

**History of Evolution of Social Indicators Movement**

The social indicators movement on scientific line has its origin dated back in 1929, when a group of social scientist was invited by President of United States of America, Herbert Hoover, to discuss the proposal of a national survey for
analysing social trends. However, the use of the phrase 'Social Indicators' became widespread only in 1962, with the publication of book with the same title edited by Raymond Bauer.5

Later in 1966 Wilburt E. and Elenor Bernor published a research paper entitled Monitoring Social Change. A Conceptual and Pragmatic Statement. They attempted to define the concept of social change as structural transformation. They also pointed out certain area to examine social change. On the very basis of framework proposed by these scientist, a book was edited by Sheldon and Moore in 1968 with the title 'Indicator of Social Change'. This book was considered as most comprehensive work on social indicators of recent trend in the major dimension of American society.6

Pioneer research on the use of indicators was carried only by U.N.O., whose aims is to increase the level of living its member nations. The use of indicators for the measurement of level of living was suggested by the United Nations Committee of experts in its report on 'International Definition and Measurement of Standards and Level of Living. It attempted to describe the level of living in terms of a series of components representing accepted values and recommended
measurement of the various components in terms of a series of indicators.

The US department of Health, Education and Welfare, released a seminal document entitled 'Towards a Social Report' which is considered as the most important event in the history of social indicators movement. It developed interest among professionals as well as ordinary people towards the indicators movement. This document explores a variety of measures that can help to monitor, changing social conditions in several areas viz; health and illness, social mobility, physical environment, income and property, public order and safety, learning science arts and participation and alienation etc. It also discuss the availability and utility of indicators, sets out criteria for the choice of indicator and argues that these are necessary requisites for the development of any social report that would a comprehensive image of social life. However, the publication of “Toward A Social Report” was stopped after few years, but the work on social indicators continued at the federal government level. A major achievement of federal government in this direction is the publication of social indicators in 1974. It contains
statistics reflecting social conditions and trends in United States. It focussed its attention on the eight major social aspects viz, health, public safety, housing, education, income, leisure, recreation and population.

Jaques Delores was credited for social indicators movement in France on his work.⁸ 'Les Indicateurs Sociaux' which was published in 1968. The publication gives information on various aspects of French society and stimulate researchers and government agencies to construct social indicators. In Japan Sanwa Bank has attempted to compare national well-being with that of other advanced industrial nations by means of 'happiness index. Similarly, in Federal Republic of Germany, Norway, Sweden, Canada, United Kingdom initiated the work of social indicators and this can be documented by the publication of a number of statistical volumes.

Thus, social indicators movement which begun in the United States in mid 1960 and has since spread across both Atlantic and Pacific.⁹
Social Indicators Movement in India

The main sources of information in relation to various socio-economic aspects of society of India are the Census Organization, ‘The Central Statistical Organization’. The National Sample Survey’, The Planning Commission’ and ‘the Indian Council of Social Science Research’. Different Ministries also collect and provide data relevant to them, such as health, labour, education, agriculture, industry etc.

The ‘Census Organization’ is the most important agency which collects and produces data covering a wider range of socio-economic conditions of the Indian people. The census operation in India is undertaken once in a decade (ten year). The data available from census includes demographic attributes such as population distribution, growth of population, density of population, age and sex composition and migration etc. It also provides data on literacy education attainment, workers in different activities and houseless population. Besides from census, some specific studies are also conducted to complete information on infant mortality ratio, birth rate and death rate and fertility by sample registration survey.
The national sample survey was initially constituted for collecting information on national income estimates, later on its activities was diversified and also it compiled data related to health, housing, education, employment and unemployment, land holding etc. The frequency of collecting data on population characteristics in the span of ten years, while for employment and unemployment with a gap of five years.

The central statistical organization which is an integral part of the Ministry of Planning is closely associated with the activities of planning commission. It is responsible for coordination of statistical activities in the country, maintenance of statistical standards, conducting economic survey, plan works related to development of statistics and dissemination of plan work.

The planning commission is a supra level agency responsible for formulation of policies and plans at the national level. It develops indicators for preplan analysis of situation and its post plan assessment.

The Indian Council of Social Science Research is also one of the main research institute in the country, which plays
vital role in the development and formulating the socio-economic indicators at micro and macro levels.

Even though much of the basic information required for the compilation of indicators for regional and development planning is available, however, no coordinated attempt has yet been made to collect, compile and analyse the basic data and to prepare and published the indicators on regular basis. As a first step towards the development of such indicators, it is necessary for statistical and planning agencies to consider jointly the indicators for the development, regional planning and assessment of progress, prior to which study of indicators of social and economic inequalities is essential.

**Characteristics of Indicators**

Social and economic indicators should have following characteristics:

a) It should be closely related to the situation and always be objective oriented.

b) It should be brief and serve as ‘key indicators’.

c) It should be clearly understandable.

d) It should be designed to measure the effects of policies, plans, programmes and major goal of economic and social development.
e) It should be indicative of current trends and be usable for current analysis.

f) It should be development oriented.

g) It should be sensitive, so that small changes in areal unit could be reflected in the value of the indicator.

h) It should be available as a time series.

i) It should be easily disaggregated by geographical areas.

j) As to feasibility, the value of the indicator should easily be workable and information should not pose any problem.

k) It should be relatable to public policy goals, such as equal opportunity, public order and safety.

l) It should be stable so that complete value can be obtained over time and space. In other words, the data element used in its definition should not change their meaning over time, space and agency.

**Selection of Indicators**

The first and foremost consideration regarding selection of indicators is that only those indicators should be chosen, which are relevant to the nature of problem and easily available at different points of time. Thus, selection of indicators constitute the crux of methodology.
The United Nation Organization (U.N.O.) has also done extensive research work in this field with sole aim of raising the standard of level of the member countries. The United Research Institute for Social Development has outlined the following indicators to improve the level of living.

<table>
<thead>
<tr>
<th>Components</th>
<th>Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Nutrition</td>
<td>i. Calorie intake per head</td>
</tr>
<tr>
<td></td>
<td>ii. Protein intake per head</td>
</tr>
<tr>
<td></td>
<td>iii. Proportion of Calorie intake derived from cereals, roots tubers and sugar</td>
</tr>
<tr>
<td>2. Shelter</td>
<td>i. Quality of habitation</td>
</tr>
<tr>
<td></td>
<td>ii. density of occupancy</td>
</tr>
<tr>
<td></td>
<td>iii. independence of occupancy</td>
</tr>
<tr>
<td>3. Health</td>
<td>i. Access to medical care</td>
</tr>
<tr>
<td></td>
<td>ii. Mortality attributes to parasitic and infectious diseases.</td>
</tr>
<tr>
<td></td>
<td>iii. Proportional mortality ratio</td>
</tr>
<tr>
<td>4. Cultural</td>
<td>i. School enrolment ratio</td>
</tr>
<tr>
<td></td>
<td>ii. School output ratio</td>
</tr>
<tr>
<td></td>
<td>iii. Pupil teacher ratio</td>
</tr>
<tr>
<td>5. Leisure and</td>
<td>i. Average Leisure time</td>
</tr>
<tr>
<td>Recreation</td>
<td>ii. Daily news paper circulation</td>
</tr>
<tr>
<td></td>
<td>iii. Radio, Television and other entertainment facilities.</td>
</tr>
<tr>
<td>6. Security</td>
<td>i. Incidence of violent and accidental death</td>
</tr>
<tr>
<td></td>
<td>ii. Proportion of population covered by unemployment and sickness benefits</td>
</tr>
</tbody>
</table>
iii. proportion of population covered by retirement schemes.

7. Surplus
   i. Income surplus to the satisfaction of income basic physical and cultural needs.

The planning commission of India made an extensive study of indicators of regional development before the formulation of Fourth Plan Draft (1966-71) and accepted the following (15) fifteen indicators:

1. Total population and density
2. Number of workers engaged including percent of total workers.
3. Cultivable area per worker.
4. Net area sown per worker.
5. Percent of gross irrigated area to net sown area.
6. Percent of area sown more than once to net sown area.
7. Per-capita gross value of agricultural output.
8. Establishment and using electricity.
9. Number of worker engaged in manufacturing per lakh of population.
10. Mileage of surface road

   i) per 10039 miles

   ii) Per lakh of population

11. Number of commercial vehicle registered in the district.
12. Percentage of literates
   i) Male to total population
   ii) Female to total population

13. Percent of school going children

14. Number of seats per million population for technical
    and vocational training.

15. Hospital beds per lakh of population.

A number of Indian scholars viz, MVS Rao, Krishna
Murthy and Dhurvasan etc. who have made in depth studies
of various aspect of socio-economic condition have suggested
a series of indicators suitable for use under Indian conditions.
But there is no rigid rule with regard to the number of
indicators used. However, social scientist and planners prefer
a short list of indicators, which may present summary view of
the socio-economic situation. Selection of too many indicators
without combining them in group or in aggregate can not
reveal actual socio-economic conditions. On the other hand
the use of few indicators gloss over the important trends
which are to be noted. Therefore, as a compromise, there
should be a key indicator from each sector reflecting progress
towards major goals. One or two more supplementary
indicators to show the trends or important components of the
major goals. But every set of phenomena can be interpreted in various ways, in fact, infinitely many ways. It is the our privilege to chose among the possible interpretations the one's that appears to us most satisfactory what ever may be the reason for our choice. In what follows an attempt has been made to select a set of indicators suitable for the purpose of showing social and economic disparities, keeping in view of the aforesaid principles.

Indicators have been grouped under the following heads.

**Social indicators:**

i) Literates to total population
ii) Teacher-Student ratio
iii) Urban population to total population.
iv) Hospital Beds per lakh of population
v) Pucca houses to total houses.
vi) Safe drinking water to total population

**Economic Indicators:**

i) Working force to total population
ii) Non-agricultural employment
iii) Per-capita income
iv) Agricultural productivity
v) Registered working factories
Infrastructural Indicators:

i) Road density

ii) Per-capita electricity consumption

iii) Post offices

iv) Bank establishment.

Significance of the Indicators

Health

Health and nutrition are the most important and essential aspect of social concern. These are the basic needs of the social well being, because a sound body and mind are the basic requisites for the maintenance of a healthy society function: Likewise the proper nourishment is also pre­requisite to maintain both sound physical and mental health.

The term ‘health’ has been defined in different ways by scholars and organization. In view of WHO “a state of complete physical and mental well-being and not merely the absence of disease or infirmity” where as the Taleoft Parensons defined it as optimum capacity of an individual for effective performance of the role and task for which he has been socialized. Thus, health is a state of soundness of mind and body of an individual in which he free from any sort of
disorder. Pain of sickness and all organs of body function well and are conducive for efficient and prolonged life.

Health is influence by innumerable factors, some of important factors are nutrition, health care facilities, sanitation, drinking water, housing and environment etc. However, in the present study only Bed’s Per lakh of population have been taken into account, the other factors can be considered separately. The indicators of health care includes public health centre, hospital and dispensaries, hospital beds, number doctors in relation to population. Bed per lakh of population is a good indicator to show over all health services available in a particular region. Its inclusion was thought logical to show the disparity in the availability of health services to the masses. Another rationale for selecting the indicator is the view that the distribution of health care should not be left entirely to the operations of the private market as market allocation has been described as ‘socially inefficient’, and as a damaging the doctor patient relationship and reducing the scope for altruistic behavior.12

The number of hospitals beds, though somewhat ambiguous in the measurement of inequality, because it
could indicate the extent of illness needing hospital care, has been included. Its inclusion in the form of service in relation to population indicates the inequality in access to medical facilities. Thus, proximity to health care facilities is of paramount importance, because, this is one of the most noteworthy social facilities in which geographical space creates impurity.¹³

**Education**

Education is a crucial factor of social, economic and cultural development. It provides economic opportunities and help to overcome social barriers. It also enhances earning potential and productivity of people through acquisition of skill and information for various opportunities and jobs. Educational achievement not only in the stepping stone to job opportunities and hence earnings, but in the words of Horace Mann¹⁴, “Education is beyond all other devices of human origin, a great equalizer of the conditions of men, the balance wheel of social machinery”. Thus, education determines quality of people and development of a region. The significance of education in the present study is utmost because it acts as leveller of social and economic inequalities.
It is education that contribute significantly in improving conditions of people from state of deprivation to prosperity. "Education not only yields a huge set of benefits to individual concerned as well as to the society in the form of a larger set of externalities but it also regarded as a great equalizer in income distribution and reducing poverty and disparities". \(^{15}\)

Studies made by Tilak\(^{16}\) have proved that there is positive relationship between education and earning both at macro and micro level. The study reveals that education alone explains more than 30 percent and education together with experience about 50 percent of the variance of the individual earnings in south India districts. \(^{15}\)

Oberai and Singh observed that earning of an individual varies with the level of his educational attainment. They concluded in their study that in the Punjab plain earning of graduates and above exceeds those with no formal education or illiterate by 40 percent.\(^{17}\)

Besides improving economic conditions of people, education also determines their social status usually highly educated people are placed at higher ladder of social hierarchy and vice versa. socio-economic survey on caste /
communities undertaken by Kerala Bureau of Economic and Statistics suggests, that there is also a close link between relative position in social hierarchy and educational level attained by people.$^{18}$

Education not only bestows social status and stability to its owner but also political power as well and it makes available to the individuals wider range of alternatives for the manner in which they should arrange their lives. The social significance of education lies in its impact on alleviating the population squeezes as well as in changing the structure of stimuli to labour.$^{19}$ Level of educational development can be assessed with the help of indicators. In the present study level of educational development have been using stock indicators such as percentage of literate to the total population, teacher and students ratio's etc. Inclusion of these indicators are based on availability of data. The West Bengal is one of the less developed state of India, where illiteracy and ignorance is wide spread. In such a state removal of mass illiteracy will be proved Panacea for over all development of the people. The significance of literacy lies in the fact that it forms the basis of multilevel educational
pyramid. A literate person can distinguish between right and wrong and take right decision. Owing to the vital role which literacy plays in the socio-economic upliftment of people the founding fathers of Indian constitution recommended that education be made free and compulsory. The universalization of literacy and primary education has been recognized as one of the major goal of planning. Hence, the percentage of literates of the total population has been selected.

Levels of Urbanization

The level of urbanization is considered to be an indicator of industrialization, modernization and economic development. It not only improves economic condition of people but also changes their life style. In India the old tradition of caste and joint family system have been weathering away as a consequence of urbanization. Geographers defines urbanization in relation to distribution of urban spaces and proportion of urban population to the total population. It implies that an increase in both the above attributes at a given time is an indication of the growth of urbanization and vise versa. According to Census of India, a place must fulfill the following criteria to be considered as an
urban centre. (1) It must have density of population not less than 1000 persons per square miles (2) It must have at least a total population of 5000 persons. (3) Three fourth of the population must be engaged in non-agricultural activities; Although this definition leaving room for vagueness and discretion yet meant to cover newly founded industrial areas, large housing settlements or places of tourist importance which have been recently served with all civic amenities. Urbanization in the demographic sense is an increase in the proportion of the urban population to the total population over a period of time. In another words the degree of inequality in urbanization my be termed as the spatial variation in the proportion of urban to the total population of regions concerned. As long as urban to total population shows an increases it means urbanisation.

In an underdeveloped country with traditional social structure which is going through a process of socio-economic change under condition of political democracy, free migration of population has wider economic, political and cultural dimensions. Internal migration induced by small, isolated pocket of prosperity in a country in which basic development
is extremely uneven in spatial terms has perverse effect of accentuating regional inequality. There is overwhelming evidences that the country side expels not necessarily the most efficient and enterprising workers, but vast masses of landless Peasants and marginal farmers who are unable or unwilling to carry on as floating labourers in rural areas. When they flock to cities they create a spurious type of urbanization which has a dangerous potent for economic, social and political instability. The emergence of such cities, towns and growth centers therefore, has own socio-economic implications. No doubt urbanisation brings change in development processes, but at the same time also creates regional disparity. Urbanisation represents a revolutionary change in the whole pattern of social life. Itself a product of basic economy and technological developments, it tends in turn, once it come into being, to affects every aspect of existence. The traditional concepts, values and functions becomes very weak under the influence of urbanization. Thus urbanization may be regarded as one of the agent of social change. As observed by Sjoberg\textsuperscript{20} "The relationship between urbanization and social change is to complex, involves and
rarified to be accounted for in-term of simple one sided casual nexus”.

In the present study the proportion of urban population of the total population has been taken as an indicator of urbanization. The significance of urbanization is that it involves movement of people out of agricultural activities into other non-agricultural, industrial and service sectors. The social significance of urbanization is also portrayed by better facilities provided in the form of educational and medical institution, banking facilities which results in wide disparities in pattern of rural and urban living.

**Per Capita Income**

This indicates per capita income at current prices. This variable is commonly used for measuring economic development. Underdeveloped economies are distinguished from the developed economies on the basis of their low per capita income.

The income, consumption and wealth are one of the direct source of measuring the economic condition of any region or place or a person. During the past few years there has been growing criticism of the usefulness of the
conventional per-capita income as a measure of "economic welfare", and economists have never entertained the idea of per-capita income as being an economic indicator, yet despite these criticism per capita income has been widely as a general measure of development. It is quite customary to identify whether a region has been backward or advanced in level of development using the estimates of per capita income.

The per capita income as a measure of development is defined on a number of bases. One defense of 'income' is that it is an objective and value free indicator. It is a direct economic measure which can be quantified, although the technical problems related with the use of per capita income as a measure of development are numerous of ranging from the problems of pricing of products in an inflating market, problems of countries comparing region, states, comprises, etc. That have different pattern of consumption and evolution, etc. Although, numerous problems and encountered in the use of per-capita income as a measure of changed development, hence convenient, income is not a very satisfactory measures, and at best it can be taken as one of the indicators of development. However, the significant of
income lies in the fact that just as power is emerging as the primary factor of inequality in advanced industrial society, the main cause of inequality in development countries stems from unequal incomes, earnings, etc. Although, researches conducted by UNESCO has revealed that the distribution of measurable income does not in itself offer a very reliable picture of social and economic conditions, on the contrary if covers up major inequalities in the final output, i.e., in the social distribution of goods and services which determines the quality of life and have suggested that the proper. Charting of the distribution of goods and services themselves seems to be reliable.

The significance of income also lies in the fact that it makes access possible to other welfare measures such as health, nutrition, education and housing etc. It has been found that with the increase of income, accessibility become much easier, while with the decrease of income if becomes comparating much more difficult.

Income thus, forms the containing link between all the varying aspects of life. Each aspect being interconnected with
the other, but all relying on income for their sustenance and improvement.

**Occupational Structure**

Occupational structure of a society is one of the good indicators of social and economic inequality, because to a large extent it determines the level of living. Study intended to understand the pattern of disparity should, therefore, give due attention to this feature. In addition to providing an insight into the nature of economy it also throws light on socio-economic, cultural and political condition of society.

For instance the proportion of workers engaged in secondary and territory sector is an indicator of development, whence as the agricultural sector is indicative of comparative underdevelopment. This is due to the fact that value added by manufacturing services sectors are higher than that the agricultural sector. That is why percentage of workers depending on manufacturing and territory sectors is very high in development countries, but it is very low in developing countries.

Clark observes that a rise in per-capita income is accomplished by a decline in proportion of workers in
agriculture and increase in manufacturing and service activities. Thus changes in the composition of work force reflects change in the economy of a region. For instance a movement of workers from the agricultural sector to secondary and territory sectors implies greater economic development and a higher level of well being. Despite its limitation in comprehending all forces determining the comparative contribution of economic activities to the regional development, work force provide, only uniform basis for measuring and comparing the distribution, the volume and types of economic activities which are indicators of economic development. In this way workforce is a better measure of the relative level of development than income per-capita, value added or value of products. Comparison overtime based on these indicators would be distorted if changes in prices level took place.

**Level of Agricultural Development**

Agriculture plays an important role in overall development as it provides food surplus to the growing population, raw material to agro-based industries, employment to rural population and improves their standard of living. According to an OECD group of experts, agriculture
can contribute to growth by increasing efficiency of population and releasing resources to other sector by adjusting the composition and of agricultural production in proportion with the growth in internal and external demands.

By the transfer of resources, labour and capital from agriculture to other sector of the economy, thus contributing to overall growth if the productivity of factors transfer is higher outside the agricultural sector than within it. By contributing to the simply of foreign exchange and the balance of payments, to the extent that the export of scale of output to demand containing and substantial adjustments in agricultural technology, in the structure of the industry and in the composition and cost of farm output are in the basis for agriculture’s contribution to the well balanced and rapid growth in the economy. Furthermore, agriculture can contribute to overall development in ways.

By increasing the volume of agricultural products exceeds imports. The foreign currency obtained from net export can be used to import of the capital goods needed to modernize the economy. By contributing to the process of industrialization either through the supplying raw materials for the agriculture industries or through purchasing
industrial goods, thus stimulating the process of industrialization and over all growth.\textsuperscript{22}

Rising agricultural productivity supports and sustains industrial development in several important ways, firstly to permit agriculture to release part of its labour force for industrial employment while meeting the increasing food needs of the non-agricultural sectors. Secondly it raises agricultural incomes, thereby creating the rural purchasing power needed to buy the new industrial goods and rural savings. Which may then be modified by direct or indirect means to finance industrial development. Finally it enables agriculture to supply the major wage goods (food) of industrial workers at prices favorable to the profitability of new industry.

Agriculture development also bring social and cultural developments as increased per capita income in rural areas invariably results in increased literacy and level of education which are conducive for social transformation.

It is clear that under all circumstances agricultural productivity makes important contribution to regional development and that within considerable limit at least it is one of the pre-conditions which must be established before a
take-off into self sustained economic growth becomes possible. It is equally clear that social and cultural change necessary to assimilate new industrial and technological development is possible through increased agricultural production.23

Agricultural development can be measured both intense of input such as seeds, fertilizer, irrigation, mechanization etc as well as output like productivity.

**Level of Industrial Development**

Industrialization is a key force of rapid development of any economy. Most of the economics have accepted industrialization as the most dominant component of their development strategies. Industrial units of organize sectors generally provide life blood to the economic system by their leading role in transmitting growth impulses to the surrounding areas through their backward and forward linkages. Most of the infrastructure such as means of transportation, power and banking expands along with industrial development while their availability in the area causes concentration of industries. Industrialization not only provide employment opportunities and reduce the dependence of workforce on agriculture but also act as an
agent of socio-cultural transformation by bringing about urbanization.

There is a great degree of association between industrialization and urbanization and both of them moves side by side in the same direction. If one try to explain the genesis of urbanization finds that as soon as a new manufacturing plant is located in rural area it gives rise to trace, commerce and transport activities. It also further attracts many more allied industries in that area due to certain locational advantages. Hence in large proportional get job in these non agricultural activities, the economy of the area is transformed and thus urbanization. Kuznets\textsuperscript{24} observed positive and marked association of urbanization, industrialization and per-capita income at international level. He found that in utmost all advanced countries which one highly industrialized have high degree of urbanization and high per-capita income and vise versa. A balance explanation of the connection of industrialization and per-capita income is that industrially countries are able to exploit their economic potentials by higher technology in almost one sector which produce high returns.
It is a serious misnomer that industrial development is paramount and the only means of economic upliftment. No doubt, the most advanced countries are the once which are the best developed industrially, but the basis of industrial development lies in agriculture and a balance between the two is essential for the achievement of economic progress and to avoid structural disequilibrium which may be a source of hardship, besides agricultural output in the words of W.W. Rostow provides the "basic working capital for industrialization".\textsuperscript{25}

(B) METHODOLOGICAL FRAMEWORK

In the present study the state of West Bengal has been selected for an enquiry into the spatial dimensions of social and economic disparities. The 16 districts of the state have been made the basis of analyzing the pattern of socio-economic spatial disparity. For the analysis of the data two methods have been used, Standard Score Additive Model also known as Z-Score and Factor analysis. With the help of statistical methods, models of regional economic development and regional disparities have been worked out. These two methods have been used to provide deeper insights into the
factors influencing regional economic development. A variety of socio-economic variables are used to explain economic development of the region. The proper selection of indicators constitutes the crux of the methodology for it is through these that the pertinent questions are asked once they have been identified and analyzed.

**The Variables**

The variables selected for this study have been very carefully observed in the context of the theoretical constructs and background of the state. Furthermore, unit-wise selection of variables were also observed in this context.

The socio-economic variables selected for this study include rate of urbanization, rate of literacy, density of workers and hospitals bed per lakh of population etc. The economic variables used are labour force participation, non-agricultural employment, per-capita income and per-capita energy consumption etc. There is a high degree of relationship between social and economic variables to show the level of economic development of a region. All these variables are essential links in explaining the level of
economic development. The following important points regarding the analysis are to be noted.

a) In all cases original data have been transformed into percentages, proportions, ratios and indices depending on the general patterns on which the specific variables need to be transformed into.

b) Data has been collected from several secondary sources. Apart from data pertaining to population studies e.g. literacy, education, occupation, urbanization, drinking water facilities etc. available from census volume (1991); other data have been obtained from the economic review West Bengal (1987-1993) A Statistical abstract of West Bengal (1978-1989), A Statistical Hand Book India etc. The selection of these data was based mainly on their availability and comparability from different districts of West Bengal.

c) The number of variables in the study have been listed in table 3.1. Although an attempt has been made to include as wide a range of variables as possible, relating to social and economic characteristics, the coverage is not complete. Moreover the number of variables within each major category varies widely.
Although an attempt has been made to make the nature of the analysis as comprehensive as possible. Yet there have been certain limitations, e.g., in the income per capita should have been balanced by information on per capita expenditure, but the latter information is not available district wise, surrogate in the form of electricity consumption has been used.

**Unit of Analysis:**

The political division of the state in the form of district have been taken as the basic unit of analysis in order to facilitate the collection of data, because most data is available in this form. The state of West Bengal in the eastern region of India is a prototype region of the country. A detailed study of socio-cultural, demographic and socio-economic characteristics of the region will enable us to understand the causes and problems of regional disparities, and possible solutions for regional disparities.

There are various factors of using the state of West Bengal as the focus of this study.

i) The region has a distinct geographical administrative (i.e., State) boundary.
ii) It comprises both rural and urban population having villages, towns and metropolitan areas.

iii) The state comprises a population ranging from the very poor to very high income groups.

iv) There are planning organizations and administrative offices (Local, District, State and National Levels), educational and research organization from which much essential data can be obtained.

v) Data is available from census publications, statistical abstracts of West Bengal, Economic Review and Government of West Bengal Bureau of Applied Economic and Statistics.

vi) It has various regional planning organization and authorities.

vii) The researcher has personal knowledge about the state and its tradition, culture and the people of the region.

A certain degree of problems are there in the case of West Bengal due to changes in the boundaries of district between censuses. Bifurcation of 24 parganas into North and South 24 parganas, West Dinajpur into North and South
Dinajpur and Midnapore also divided into two districts. Before that lane was 16 sixteen districts and it has now 19 nineteen districts in West Bengal. Due to unavailability of recent data for the district. Recently created. The study comprises of 16 sixteen districts only.

**Analytical Methods**

It is essential to construct a model to achieve the main objectives of the study. This model should suit required conditions and promote the goal of universal applicability. A proper empirical verification of the model in this study involves a large number of indicators i.e., economic, social and infrastructural. Now it is important that the indicators compiled are put to proper use. No satisfactory project can be survive for long if the data procured are not put to proper use and these are possible by quantitative methods.

The common methods of expressing inequality are the Lorenz Curve, which is closely related to the Gini-coefficient, Williamssons Co-efficient of variation and computation of the Location Quotients, Schutz Co-efficient of Equality and Theil’s Index etc., while the method of joint count statistics.
However, these are measures employed for the measurement of disparities on a limited scale i.e., they have the limitation of being methods of bi-variate inter-relationship and are cumbersome. Therefore, in order to take a more comprehensive study on a wide array of variables the standard score Additive Model or Z-score method has been used to arrive at a composite pictures. Z-score has been used to develop a composite score for each set of indicators in order to arrive at the general level of social and economic disparities for the state as a whole while factor analysis has been used to reduce the large number of variables (15), many of them interrelated, to the few independent underlying dimensions, called factors, which are supposed to be responsible for spatial variation.

The Z-score is a linear transformation of the original data in such a way that its mean become 'o' and its standard derivation become unity. For observation 'i' on any variable, the standard score ($Z_i$) is given by:

$$Z_i = \frac{X_i - \overline{X}}{SD}$$

where $X_i$ is the original value for observation (i)
$\overline{X}$ is the mean of the variable
SD is the standard Deviation.

The transformation of a set of variable in this way results in the equalization of two important parameters of this distribution and the units of measurement are eliminated, thus enabling scores on different variables to be combined by simple addition.

The question of the assignment of weightage is rather a tricky one as weightage may be assigned on the basis of personal expertise, on judgment or on the basis of some measures of differential preference, or empirically from some attitudinal survey. However, the present study has been conducted on an equal weightage basis, a value judgment for which there is no empirical support. Studies based on this procedure assume linear pay offs among variable; thus an increase of say 1.0 (in Z units) in a very high performing territory can be equated with the same increase in an area of average performance. The equal weighting assumption implies a negative sloping 45° indifference line in the community's plotted in Z-scores along the axes.

The overall situation or composite index of social and economic inequality may be expressed for any district as
$SEI = \sum_{i=1}^{m} Z_{ij}$

where

- $SEI$ = Stands for social and economic inequality.
- $m$ = is the number of variables that is 15 in the present study area.
- $ij$ = is the magnitude of indicators for district.
- $Z_{ij}$ = is the standard score of variable $(i)$ in the district, $i$.

By this method result can be obtained as 'o' indicates average performance and unity plus or minus (+ or -) represents one standard deviation in either direction plus (+) and minus (-) shows high and low values, respectively.

**Factor Analysis**

The technique employed in this study is factor analysis – a multivariate analysis used for the analyzing spatial patterns in socio-economic disparities. The chief purpose of factor analysis is to obtain scientific parsimony or economy of description.

Gregg and Banks review factor analysis as dealing with the internal structure of matrices of convenience. So, a large number of variables are clustered on the basis of their inter
correlations and each set reflects a single dimension which cause the association within the original set of data. Each variable is correlated with every other variable using a product moment correlation.

This technique was first developed by psychologist early in the twentieth century as a means of analyzing the results from intelligence test\textsuperscript{32} and later used by other disciplines is a method of studying simultaneously the complex interrelationships between many variables, as measured for many different observations and summarizing salient features of relationship in the form of a few underlying dimensions called factors. Factor analysis offers a solution by dividing the characteristic into independent sources of variation (factors). Each factor represents a scale based on the empirical relationships among the characteristics.

Although studies of a geographic nature were undertaken at an early date by sociologists,\textsuperscript{33} the technique has been used only recently by geographers. The geographical studies conducted by geographer incorporating factor analysis include economic regionalization\textsuperscript{34} climatic regionalization\textsuperscript{35} classification of cities\textsuperscript{36}, the regionalization
of Urban areas and the analysis of commodity flow patterns etc.

**Computational Procedure of Factor Analysis**

The factor analysis used for the study is based on 15 variables pertaining to spatial dimension of social, and economic disparities persists in the social, economic, demographic, consumption and production characteristics of the population of 16 districts of West Bengal.

There are four mathematical principles which generally govern the formation of the factors.

1. The variable that are most clearly interco-related are combined within a single factor.

2. Factors are derived in a procedure, which maximizes the percentage of the total variance of the original variables attributable to each successive factor.

3. The variable allocated to a given factor are those that are almost independent of the variables constituted to other factors.

4. Factors are derived to minimize the correlation between them.
The factor scores are used to measure the variation in the attributes of regional economic development. New independent variables are obtained from this principal component approach. The sum of the squared factor loadings of each variable is called communality \((h^2)\) the factor loading matrix contributes each original variable to each component and therefore can be interpreted as a correlation matrix. The eigen values are used to determine the amount of original variance accounted for by the underlying dimensions.\(^{39}\)

The factor analysis is somewhat similar to orthogonal least squares developed by Pearson and the same extended by Hotelling for analyzing the correlation structure. Computation for this analysis was carried on A.M.U. ALPHA computing system. The programmes of Factor Analysis is available in the stored standard subroutine package which gives a principal component, solution. The model for the factor analysis used in the study involves the following steps.

1. Initial computation is based on transformation of the original data matrix \(D\) for \(n\) observation, on the \(m\) variables into the standard score matrix \(Z\) of \(n \times m\) order.
2. From the standard score matrix $Z$ an $n \times m$ order correlation matrix $R$ was calculated, which contained product moment correlation coefficient between each variable and every other variable.

3. This correlation matrix was resolved into a factor loading matrix $A$ of $m \times r$, such that $r$ was the number of factors extracted. The programme employed is such that it can extract as many principal components as the number of variables. Therefore, the first instance all the factors were extracted. Histogram of the cumulative percentage of the variance explained by the successive factors and cumulative number of factors was constructed. By inspecting the rate of change in the explanation of variation by factors, the number of factors to be retained was determined.

4. Due to difficulty of interpretation of original variables retained, the factor loading matrix $A$ was rotating according to normal varimax criterion to reproduce a new rotated factor loading matrix the criterion employed rotated the factor matrix to such a position where a minimum possible number of variables loaded high on each
factor. Thus, making the factor structure simpler and easily interpretable.

5. The mathematical manipulation of the standard score matrix of \( n \times m \) order and rotated factor loading matrix of \( A \) of \( m \times r \) order (and the eigen values) a factor score matrix of \( n \times r \) order obtained. There factors scores \( F \) (normalized to Zero mean and unit variance) provide a measure of position for each observation (district) on the new factors.

Eigen values are the sum of squared factor loadings for each factor and indicate the amount and proportion of the total variance in the original data accounted for by each factor. Factors are extracted in descending order of magnitude and are orthogonal or essentially uncorrelated with each other.

The sum of the squared factors loadings across each row of the matrix \( A \) are known as communalities and which is accounted for by the ‘X’ factors together.

One of the difficult task in factor analysis, however, is the identification or giving some meaning to the newly produced factors in the light of the original data because
variables may load about equally with the number of factors rather than correlate with as few factors as possible. The factors are extracted in descending order, according to their importance i.e., in order of their contribution to total variance of the data matrix, and the factor scores extracted from the analysis permits mapping the basic dimensions of the variables used for the identification of spatial disparity of social and economic life pattern.
References


8. Lane, Kenneth, C., op. cit. p. 11.


15. Mandelbaum, D.G. Some effects of Population growth in India on Social interaction and region”.


34. Ahmad, Q., Indian Cities: characteristics and correlations. Department of Geography Research Paper Number 102, Chicago 1965.


CHAPTER 4

SPATIAL PATTERN OF SOCIO-ECONOMIC DISPARITIES
CHAPTER 4

SPATIAL PATTERN OF SOCIO-ECONOMIC DISPARITIES

An attempt has been made in this chapter to test the hypothesis that regional disparities in the level of socio-economic development exist in the study area (the state of West Bengal) at district level. The analysis of the regional disparities provide base for formulation of policies and plans aimed at developing a suitable operational strategy for minimizing and eliminating it to the extent possible. Such type of studies is of great help for the researchers, administrators, policy makers and planner to identify regions of relative level of development in order to know the needs of varied regions and suggest remedial measures for their development. Thus measurement of disparity in terms of a large number of socio-economic indicators in regional context is one of the essential pre-requisites for balance development of the study area.

In order to measure regional disparities the statistical technique, the standard score additive Model has been used. Z-score has been used to develop a composite score for each set of indicators in order to arrive at the general levels of
social and economic disparities for the state as a whole. The Z-score is a linear transformation of the original data in such a way that its mean becomes zero and its standard deviation become unity. For observation ‘i’ on any variable, the standard score (z) is given by

\[ Z_i = \frac{X_i - \bar{X}}{SD} \]

where,

- \( X_i \) is the original value for observation (i)
- \( \bar{X} \) is the mean of the variable
- SD is the standard deviation

The standardized scores have been divided into three grades (class intervals) of high, medium and low. The high scores are more than +0.4 standard deviation from the mean (0). The category of high scores range from +0.4 and above. The medium grade of Z-score ranges from +0.4 to -0.4 standard deviation. The Z-scores ranging below -0.4 are categorized in low grades.

The two specific objectives being (a) to identify the spatial patterns of disparities in terms of selected indicators. (b) to construct a composite level of development in order to
delineate the developed and backward regions at different
level of development. Three sets of indicators have been used
to reach the overall development in the state. Social
indicators, which includes, literacy rate, teacher student
ratio, urban population to total population, Hospital beds per
lakh of population, Pucca houses to total houses and the safe
drinking water available to total population. While economic
indicators used as percentage of working forces to total
population, non-agricultural employment, per capita income
in (Rs), Agricultural productivity per hectare in (Rs) and the
Registered working factories. Another set of indicators which
are very important for such types of studies, are related to
infrastructural facilities available in the study area which
include Road density in per square kilometre, per capita
electricity consumption, Post Offices per lakh of population
and Banks per lakh of population.

The analysis of data using Z-score Model reveals that
there is marked regional disparities in terms of fifteen selected
indicators in the study area. Though various regions of
individual or a set of indicators do not necessarily correspond
with one another. }
Table 4.1, contains Z-scores for individual, sectoral as well over all indicators. Disparities have been shown categorizing and mapping all district into high medium and low grades. The variable displays the percentage of literate to the total population. Literacy in India is defined as the capability of any persons being able to read or write in any language is considered to be a literate. Education plays an important role in developmental processes. It has been included in the present study in view of the fact that still the greater mass of the population is illiterate in (West Bengal where the percentage of literacy is 57.7 in 1991). Literacy forms the foundation on which the edifices of other educational achievement rest. It is one of the most important socio-economic parameters or attributes of measuring the advancement or backwardness of the society or a social group. In the present era, education is one of the major source of economic growth. There is a close linkage between educational development and the man power planning. Figure 4.1 reveals spatial patterns of disparity in terms of percentage of literates to the total population. It is clear from the map that literacy is high in the six districts namely Calcutta (2.13), Howrah (1.03), Hooghly (1.02), Midnapore (1.03), Burdwan (0.05) and Darjeeling (0.50).
<table>
<thead>
<tr>
<th>District</th>
<th>Buadwan</th>
<th>Birbhum</th>
<th>Bankura</th>
<th>Midnapur</th>
<th>Howrah</th>
<th>Hooghly</th>
<th>24 Pargana</th>
<th>Kolkata</th>
<th>Nadia</th>
<th>Murshidabad</th>
<th>W. Dinajpur</th>
<th>Malda</th>
<th>Jalpaiguri</th>
<th>Darjeeling</th>
<th>Cooch Behar</th>
<th>Purulia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z-Score</td>
<td>0.5928</td>
<td>-0.2681</td>
<td>0.4546</td>
<td>1.0835</td>
<td>-0.0310</td>
<td>0.7816</td>
<td>-0.0398</td>
<td>0.5556</td>
<td>0.5332</td>
<td>0.2083</td>
<td>0.1455</td>
<td>0.9399</td>
<td>0.3276</td>
<td>1.4457</td>
<td>0.3428</td>
<td>1.5847</td>
</tr>
</tbody>
</table>

Table 4.1
Spatial Pattern of Socio Economic Disparities
Z - Score
In the category of medium level of literacy development two main regions have been identified. One of the region covering the districts of 24-pargana (0.28) and Nadia (-0.11), and other region of medium literacy rate is found in Bankura (-0.19). Most of the district of North Bengal (except Darjeeling), Jalpaiguri (-0.64), Coochbehar (-0.64), west Dinajpur (-1.10), Murshidabad (-1.23) Malda (-1.43), Birbhum (-0.44) and Purulia (-0.79) record low level of literacy.

Inclusion of variable, teacher-student ratio in this study has been made in order to determine the quality of educational services available to the population. It is widely observed fact that overworked teachers cannot pay individual attention to a large number of students in classes and also it has a deteriorative influence both on the capability of teachers, as well as on the results of students.

The teacher-student ratio has been shown in Figure 4.2 which reveals a different pattern as compared to the literacy rate. The districts recording high teacher-student ratio are Howrah (0.51), 24-pargana (0.40), Nadia (1.50), Murshidabad (0.45), Birbhum (0.66), Darjeeling (1.86) and Jalpaiguri (0.91).
WEST BENGAL
Teacher-Student Ratio

Fig. 4.2
While districts of Burdwan (-0.28) Midnapore (-0.13), and Malda (0.18) are found at a moderate level of teacher student ratio. The remaining five district having very low teacher-student are Purulia (-1.11) Bankura (-0.13) Calcutta (-1.18), West Dinajpore (-0.59) and Coach Behar (-0.63)

The selection of levels of urbanization as a social indicator has been based on the fact that although a city or a town, in concrete term, refer to an object in social space. The social significance of urbanization lies in the fact that it changes the occupational pattern, which in turn affect the income patterns, thus enhances material standard and higher social needs of life. It provides varying life styles as distinct from rural way of life. The urban population gets better facilities of education, medical institution, banking facilities and other facilities which cause a big gap between rural and urban living. The variable selected in this study for this purpose is percentage of urban population to the total population, which shows degree of urbanization in any area. Urbanization of an area or a district is positively correlated with the levels of economic development.

Figure 4.3 reveals the spatial patterns of disparity as regards the indicator pertaining to levels of urbanization.
WEST BENGAL
Urban Population
1991

Z-Score

H
M
L

+ 0.4
- 0.4

Fig. 4.3
Here again a great disparity is found between the industrial and non industrial districts, Calcutta (3.16), Howrah (1.04), Burdwan (0.45) which are highly industrial also records high level of urbanization.

The urbanization is of medium level in a large region, occurring in the districts of 24-pargana (0.32), Darjeeling (0.25), Jalpaiguri (-0.34) Hooghly (0.26) and Nadia (-0.08).

The districts recording low level of urbanization are Purulia (-0.63), Bankura (-0.68), Birbhum (-0.65), Murshidabad (-0.59), West Dinajpur (-0.47) and Cooch Behar (-0.74).

It is rightly said that health is wealth or sound mind lives in sound body. Selection of hospital beds per lakh of population is one of the important indicators of the availability of health services. It is basic requisite for the social well being and overall development of a region. Figure 4.4 reveals the spatial patterns of disparity in terms of Hospital beds per lakh of population. There is a marked regional variations among the districts of West Bengal. The districts of Burdwan (1.09), Calcutta (4.43), Nadia (1.37) and Darjeeling (2.17) have the highest number of hospital beds per lakh of population.
The district having medium range of facilities are Jalpaiguri (0.87), Murshidabad (0.06), Birbhum, (0.74), Howrah (0.87), Hooghly (0.85), Bankura (1.05) and Purulia (0.88). The low level of hospital beds is found in the district of 24-pargana (0.54), Midnapore (0.54) and Cooch behar (0.50).

The significance of housing as a social indicator cannot be ignored. It is one of the basic needs of society. The ownership of a house not only enhances economic standards but also lends an aura of social status to its owner. The study of physical quality of houses is essential i.e. Pucca houses to total houses. This information will provide the level of socio-economic status of the owners or dwellers of the houses.

The spatial pattern of disparity pertaining to the pucca houses to total houses has been portrayed in the Figure 4.5. The map reveals that the district of Calcutta (2.81), Howrah (1.26), 24-pargana (0.44) and Burdwan (0.47) have large number of pucca houses.

There are four districts having moderate number of pucca houses. These are Darjeeling (-0.12), Jalpaiguri (-0.34), Nadia (0.12) and Murshidabad (-0.18).
WEST BENGAL
Pucca Houses
1991

Z-Score

H
M
L
+ 0.4
- 0.4

KM
Fig. 4.5
Majority of the districts record less number of pucca houses to total houses, which include Coach Behar (-0.14), West Dinajpore (-0.97), Birbhum (-0.85) Midnapore (-0.79), Bankura (-0.64) and Purulia (-0.42).

Water is one of the most essential requirements not only for the sustenance of life, but also for the maintenance of health and hygiene of the human beings. The rural area are still characterized by acute scarcity of water, especially the safe drinking water. The main sources of water in rural areas were previously rivers, tanks and wells, but with rapid development in science and technology tube wells become increasingly common. In the present study the supply of potable tap water has been taken as an indicator of development. Figure 4.6 shows regional pattern of disparity in the availability of safe drinking water to the total population in West Bengal. It has been observed that the districts around Calcutta (0.88) have better facilities of safe drinking water, like Howrah (0.83), Nadia (0.95), Hooghly (0.91), 24-pargana (0.93), Murshidabad (0.88).

Moderate level of districts in terms of safe drinking waters are Midnapore (-0.01), Burdwan (0.33), Birbhum (0.27) Coochbehar (0.16), Malda (-0.03), and west-Dinajpore (-0.02).
WEST BENGAL Safe Drinking Water 1991

Fig. 4.6
Low level of safe drinking water facilities are available in the districts of Purulia (-1.72), Bankura (-0.89), Darjeeling (-1.83) and Jalpaiguri (-1.65).

Percentage of work force to the total population reflects the economically active working population (15-60 age group). It shows the human resource potential of the population. This variable is an important measure of the economic health of the population. Figure 4.7 shows spatial pattern of disparity in working force to the total population in the study area. The less developed areas have high percentage of working forces to the total population, like Purulia (2.74), Bankura (0.74), Midnapore (0.42) and Darjeeling (1.10).

A large region of medium range of working forces exits in major parts of West Bengal. This region includes the district of Jalpaiguri (0.10) Cooch Behar (-0.26) west Dinajpore (0.33), Birbhum (-0.06), Calcutta (-0.14) and Malda (0.25).

The districts recording low percentage of work force to the total population are Burdwan (-0.59), Hooghly (-0.60), Murshidabad (-0.50), Nadia (-1.10), 24-pargana (-1.14) and Howrah (-1.00).
The percentage of non-agricultural workers to the total population is one of the good indicators of economic development for any region. The region where higher percentage of population is engaged in these sectors is considered to be economically and socially developed and vice-versa.

Figure 4.8 exhibits regional pattern of non-agricultural employment in West Bengal. There are two districts namely Calcutta (2.16) and Howrah (1.24) in the southern part of the state having very high level of non-agricultural employment. The other region lies in northern part of the state including Darjeeling (1.06) and Jalpaiguri (0.55).

Medium level of non-agricultural employment are found in Calcutta and its surrounding districts namely 24-pargana (0.34), Hooghly (0.37), Nadia (-0.22) and Burdwan (0.16).

Low level of non-agricultural employment is found mostly in the backward districts like Purulia (-0.85), Bankura (-0.88), Midnapore (-0.58), Birbhum (-0.74), Malda (-0.60), Murshidabad (-0.70), west Dinajpore (-0.95) and Cooch Behar (-0.79).
WEST BENGAL
Non Agricultural Employment
1991

Fig. 4.8
Per capita income as a measure of development is very useful indicator. It is commonly used for measuring economic development. Underdeveloped economies or regions are distinguished from the developed economies on the basis of their low per capita income. Though the usefulness of the per capita income as a measure of "economic welfare" have been questioned by Economists, yet inspite of these criticism per capita income has been widely used as a general measure of development. In the present study it has been included as one of the indicators of development. Figure 4.9 reveals spatial pattern of disparities in the levels of per capita income in West Bengal. Calcutta (2.47), Howrah (1.15), Hooghly (0.75), 24-pargana (0.94) and Burdwan (0.78) have high per capita income. These districts are highly industrialized as well as agriculturally developed.

The another set of districts, which have medium level of per capita income are Darjeeling (0.11), Murshidabad (0.17), Birbhum (0.04), Bankura (-0.36) and Purulia (-0.35). The districts having low level of per capita income are Midnapore (-0.92), Nadia (-0.59), West Dinajpore (-1.01), Jalpaiguri (-0.61) and Cooch Behar (-1.33).
Selection of variable pertaining to agricultural productivity in (Rs.) has been included in this study because it shows level of agricultural development of any area. The significance this indicators in the present study is mainly because of the fact that the agriculture contributes significantly to the income of the West Bengal and more than 57 per cent of its work force is engaged in this sector. Thus, it is an indicator of degree of agricultural modernization. It is also a measure of the levels of economic development. Increased agricultural productivity contributes to overall economic development of the region. Figure 4.10 exhibits regional disparity as regards agricultural productivity per hectare. The level of agricultural productivity is high in the district of Hooghly (0.92), Burdwan (0.87), Nadia (1.53) and Murshidabad (0.93). A large and compact region of medium level of development is found in the southern districts of West Bengal, comprising 24- pargana (0.18), Howrah (-0.20), Midnapore (0.02), Bankura (0.35), Birbhum (0.16), west Dinajpore (-0.52), Malda (0.32) and Darjeeling (-0.31).

Districts of Calcutta (-2.96) is exceptional in the case of agricultural productivity, being a metropolitan city of West Bengal. Other districts having low level of development are Purulia (-0.32), Jalpaiguri (-0.53) and Cooch Behar (-0.41).
Selection of registered working factories as one of indicators to measure the industrialization and its impact on the development of the economy in general has been taken into account in this study. The contribution of industrial development to economic welfare has been established. Industrialization tends to render a better ways of life as compared to a backward rural based economy. However it is a serious trend that industrial development is paramount and the only means of economic upliftment. No doubt, the most advanced countries are the one which are best developed industrially, but in the case of developing countries like India, the basis of industrial development lies in agriculture and a balance between the two is essential for the achievement of social and economic progress of a region.

Figure 4.11 exhibit the disparity in the level of industrial development. Again a high concentration of industries are found in Calcutta and its vicinity including Howrah (1.24) and 24-pargana (3.65).

Medium level of industrial development is found in major parts of the state which includes the districts of Burdwan (-0.30), Nadia (-0.38), Medinapore (-0.37), Hooghly (-0.16), Darjeeling (-0.32), Jalpaiguri (-0.20) and Calcutta (0.24).
WEST BENGAL
Registered Working Factories
1991

Fig. 4.11
A well marked region of low level of industrialization is found in the western part of the state which comprises the districts Purulia (-0.46), Bankura (-0.44), Birbhum (-0.42), Murshidabad (-0.50) Malda (-0.49), West Dinajpore (-0.48) and Coochbehar (-0.50).

Road density is a infrastructural indicator. The role of transport in the socio-economic development of a region is very significant. It helps in the rapid growth of a region. Its main function is to carry goods and people from one region to another. Indeed it is so important that it can truly be the life line of the region. Figure 4.12 shows a great spatial disparity in the level of road density per square kilometre. The district of Burdwan (0.55), Hooghly (1.55), Howrah (1.66), Darjeeling (0.44) and Cooch Behar (-1.00) have high level of road density. Medium density of road is found in the districts of Birbhum (-0.33), Murshidabad (0.22), Nadia (0.33), Malda (-0.44) and west Dinajpore (-0.33). The districts of Purulia (-1.00), Bankura (-0.44) Midnapore (-0.66), 24-pargana (-0.55), Calcutta (-2.33) and Jalpaiguri (0.00) have low level of road density.
WEST BENGAL
Road Density
1991

Fig. 4.12
The role of energy consumption in raising level of living of the people and economic development of a region is well established. High per capita energy consumption indicates the high standard of living and also a measure of technological progress of a region. Figure 4.13 shows the regional pattern of disparity in the level of electricity consumption in West Bengal. It reveals that the districts of Burdwan (0.53) and Hooghly (3.65) are highly developed in terms of consumption of electricity. The data for electricity consumption in Calcutta, Howrah and 24-pargana is not available, though these district are highly industrialized and economically well off.

Rest of the districts come under the medium level of consumption which includes Midnapore (-0.25) Bankura (-0.32), Purulia (-0.27), Nadia (-0.15), Birbhum (-0.27), Murshidabad (-0.31), Malda (-0.31) west Denajpore (-0.35), Darjeeling (-0.10), Jalpaiguri (-0.30) and Cooch Behar (-0.30).

Post office per lakh of population is one of the infrastructural variables of high importance, as a basic facility to the population. Figure 4.14 shows spatial patterns of number of Post Offices in the study area. The district
WEST BENGAL
Electricity Consumption
1991

Fig. 4.13
recording high concentration of post offices are 24-pargan (1.43), Midnapore (0.80), Bankura (0.93), Purulia (1.58) and Cooch Behar. There are three districts of medium level of post services namely Burdwan (-0.20), Malda (-0.34) and Darjeeling (0.14), whereas the districts, which come under low level of post office facilities are Jalpaiguri (-0.85), West Denajpore (-0.62), Murshidabad (-0.52) and Nadia (-0.47).

Banks per lakh of population is an infrastructural indicator, showing development of a region. Figure 4.15 reveals that only Calcutta (3.67) have the good facility of banks. It is obvious being the capital city and highly industrialized Calcutta have the better banking facilities in West Bengal. Whereas a large number of districts have the medium level of development regarding the availability of
WEST BENGAL
Bank Establishment
1991

Z-Score

+ 0.4
- 0.4

Fig. 4.18
Banks which includes, Burdwan (-0.10), Hooghly (-0.21), Howrah (-0.32), Birbhum (0.80), Malda (-0.26), Darjeeling (0.22) and Cooch Behar (-0.34). There are five districts having low concentration of banks are 24-pargana (-0.45), Nadia (-0.44), Murshidabad (-0.44), West Dinajpore (-0.45) and Jalpaiguri (-0.42).

It is very difficult to explain the causes responsible for the disparate pictures in each case as each indicator is showing divergent trends and patterns. The fifteen maps reveals different values and positions.
CHAPTER 5

FACTOR ANALYSIS OF SOCIAL AND ECONOMIC DISPARITIES
CHAPTER 5

FACTOR ANALYSIS OF SOCIAL AND ECONOMIC DISPARITIES

In the previous chapter regional pattern of disparities in terms of fifteen indicators have been measured. These variables shown in the table 5.1 in relation to the sixteen observations, suggest that there is a need to reduce the similar variables into major groups of variables. Such data reduction can be done by factor analysis. An attempt has been made to determine the relative importance of different variable of socio-economic development in West Bengal. The existing position of disparities has been assessed in three ways. Firstly taking correlation coefficients matrix, measuring the relationship between a set of individual indicators. Secondly various dimensions of disparities were identify through factor scores and their regional patterns were mapped in the study area. Thirdly the overall socio-economic development is highlighted by composite score obtained by adding all the factors score divided by their total numbers.)
Data processing of factor analysis has been done through SPSS package programme on computer ALPHA.

## Indicators of Socio Economic Development

### Table 5.1

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>$X_1$</td>
<td>Percentage of Literates to total population</td>
</tr>
<tr>
<td>$X_2$</td>
<td>Teacher-Student Ratio</td>
</tr>
<tr>
<td>$X_3$</td>
<td>Percentage of Urban population to total population</td>
</tr>
<tr>
<td>$X_4$</td>
<td>Hospital beds per lakh of population</td>
</tr>
<tr>
<td>$X_5$</td>
<td>Percentage of Pucca houses to total houses</td>
</tr>
<tr>
<td>$X_6$</td>
<td>Percentage of safe drinking water to total population</td>
</tr>
<tr>
<td>$X_7$</td>
<td>Percentage of working force to total population</td>
</tr>
<tr>
<td>$X_8$</td>
<td>Percentage of non-agricultural employment</td>
</tr>
<tr>
<td>$X_9$</td>
<td>Per-capita income in Rs.</td>
</tr>
<tr>
<td>$X_{10}$</td>
<td>Agricultural productivity per hectare (Rs.)</td>
</tr>
<tr>
<td>$X_{11}$</td>
<td>Number of registered working factories</td>
</tr>
<tr>
<td>$X_{12}$</td>
<td>Road density Km/Sq. Km.</td>
</tr>
<tr>
<td>$X_{13}$</td>
<td>Per-capita electricity consumption</td>
</tr>
<tr>
<td>$X_{14}$</td>
<td>Post office per lakh of population</td>
</tr>
<tr>
<td>$X_{15}$</td>
<td>Bank per lakh of population</td>
</tr>
</tbody>
</table>

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system. The analysis is carried out at district level in one point of time i.e. 1991.

(Inter-Correlations Between measures of Socio-economic Development)

The degree and strength of relationship between variables can be identified from zero order correlations. From the analysis of the fifteen variables the following relationships have been derived from table 5.2.

(a) The literacy is highly positive and directly related with urbanisation (0.79), non-agricultural employment (0.76), Hospitals beds (0.64), pucca houses to total houses (0.76), banks per lakh of population (0.62) and per capita income (0.75). It is moderately correlated with safe drinking water to total population (0.30), registered working factories (0.33) and per capita electricity consumption (0.29). The negative correlation is found with teacher student ratio (-0.11), working force to total population (-0.30), agricultural productivity per hectare (-0.37) and road density (-0.05). It shows that developed regions are related with the level of literacy. The higher the literacy, the greater will be the degree of development. Therefore, expansion of education facilities
Inter correlations between measures of socio-economic development

Table 5.2

<table>
<thead>
<tr>
<th></th>
<th>X_1</th>
<th>X_2</th>
<th>X_3</th>
<th>X_4</th>
<th>X_5</th>
<th>X_6</th>
<th>X_7</th>
<th>X_8</th>
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<th>X_11</th>
<th>X_12</th>
<th>X_13</th>
<th>X_14</th>
<th>X_15</th>
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<td>X_2</td>
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<td>X_3</td>
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<tr>
<td>X_5</td>
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<td>X_6</td>
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<td>0.03505</td>
<td>0.43912</td>
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<td>X_7</td>
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<td>X_8</td>
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<td>0.36694</td>
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<td>X_12</td>
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<td>-0.47651</td>
<td>-0.15032</td>
<td>0.15739</td>
<td>-0.43246</td>
<td>-0.10838</td>
<td>0.16738</td>
<td>0.58682</td>
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<td>X_13</td>
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<td>0.06796</td>
<td>-0.05714</td>
<td>0.20350</td>
<td>0.22680</td>
<td>-0.16903</td>
<td>0.09409</td>
<td>0.20465</td>
<td>0.32540</td>
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<tr>
<td>X_14</td>
<td>-0.30934</td>
<td>-0.09768</td>
<td>-0.62161</td>
<td>-0.50272</td>
<td>-0.61891</td>
<td>0.31842</td>
<td>0.37397</td>
<td>-0.62380</td>
<td>-0.39677</td>
<td>0.33537</td>
<td>0.12440</td>
<td>-0.06937</td>
<td>-0.12834</td>
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<tr>
<td>X_15</td>
<td>0.62515</td>
<td>-0.27572</td>
<td>0.84707</td>
<td>0.92924</td>
<td>0.73667</td>
<td>0.17318</td>
<td>-0.00191</td>
<td>0.72304</td>
<td>0.68969</td>
<td>-0.78881</td>
<td>0.02411</td>
<td>-0.59068</td>
<td>-0.08332</td>
<td>-0.49129</td>
<td>1.00000</td>
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</tbody>
</table>
should be done at a faster rate in the backward district, which will have a positive impact on overall development of the region.

(b) Urbanization is highly positively related with hospital beds (0.84), Pucca houses (0.95), non-agricultural employment (0.92), per-capita income (0.89), agricultural productivity (0.62) and banking facilities (0.84). It is moderately influencing availability of safe drinking water to total population (0.35), registered working factories (0.36). The remaining variables are negatively correlated. Urbanization represents a revolutionary change in the whole pattern of social life. It is positively correlated with better facilities of hospitals, the high rise buildings and Pucca houses. It assumes utmost significance in the sense that it involves movement of people from agricultural activities into other non-agricultural, industrial and other secondary and tertiary service sectors.

(c) Hospitals beds per lakh of population is highly correlated with Pucca houses (0.75) non-agricultural employment (0.79), per-capita income (0.62), and banking facilities (0.92). It has highly negative correlation with agricultural productivity (-0.66).
(d) Pucca houses are highly correlated with non-agricultural employment (0.88), per-capita income (0.92) and bank per lakh of population (0.73). It is negatively correlated with post office (-0.61), and agricultural productivity (-0.43).

(e) Work force to total population is negatively correlated with all the variables except post office (0.37), which is of moderate level.

(f) Non-agricultural employment is directly related with per capita income (0.82) and banks per lakh of population (0.72) and is negatively related with post office (-0.62) and agricultural productivity (-0.57).

(g) Per capita income is positively related with registered working factories (0.51) and banks per lakh of population (0.68).

(h) Agricultural productivity has high negative correlation with banks per lakh of population (-0.78). Road density is moderately related with electricity consumption (0.46).

   It can be summarised that literacy and urbanisation are highly correlated variables. Variables which also show strong positive relationships with urbanisation and literacy are non-agricultural employment and per capita income. While
urbanisation has a negative relationship with post office. It is due to high concentration of population in the urban area. On the contrary post office are generally available even in remote part of a district at village or block level. Working force is negatively correlated with Per capita income and non-agricultural employment. Non-agricultural employment is highly correlated with Per capita income and least significant in the case of agricultural productivity.

**Factor Structure**

Factor analysis is a mathematically sophisticated technique of the family of multivariate analysis. It condensed a multitude of features into numerically feasible factors, which seeks to explain the underlying Characteristics of the data set to which they relate. In geographical studies, the method is analogue to map comparison by means of overlays. It is effective if the number of maps are limited. The output of this analysis, the inter-correlated matrix is subjected to Factor analysis and cluster of highly inter-correlated variables (factors) are arrived at. The loadings of the variables on the factors are known as factor loadings. The loadings weighted by the original data matrix, give the weighted factor score matrix, which shows the loadings of each of the variables, on
each of the factors. The factors have been named on the basis of the pattern of loading of variables on the factors. It is very difficult to name when many variables load high on a factor. To reach at a simple factor structure, where each variable has a high loading on only one factor. This would mean a search for factor, which present a cluster of variables, which are highly inter-related. Such factor would have a distinct identity of their own. In this chapter the tabular presentation of these factor scores have been discussed. It has also been plotted in geographical space i.e., by areal unit on the map. For the present study district has been selected as an unit of analysis. The factor analysis of the fifteen variables related to social and economic Characteristics for the year of 1991 has yielded three factors as given in table 5.3 which together accounts for 75.91 per cent of the total variance in the spatial dimensions of social and economic disparities. Examination of the rotated factor loadings on these factors rendered them to be labeled as, urbanization and Socio-economic development, agricultural productivity and infrastructure and Industrialisation and education. As regard the contribution of these factors urbanization and socio-economic development explains 46.37 per cent of the total variance. Agricultural
Dimensions of Social and Economic Disparities in West Bengal

Table 5.3

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Factor</th>
<th>Percent of total variance explained by three factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Urbanization and socio-Economic Development</td>
<td>46.37%</td>
</tr>
<tr>
<td>2</td>
<td>Agricultural Productivity and infrastructure</td>
<td>19.90%</td>
</tr>
<tr>
<td>3</td>
<td>Industrialization and Education</td>
<td>9.63%</td>
</tr>
<tr>
<td>4</td>
<td>Percent of total variance explained by three factors</td>
<td>75.91%</td>
</tr>
</tbody>
</table>

Productivity and infrastructure 19.90 per cent and industrialization and education 9.63 per cent. The interpretation of the factors however, needs great caution as the relation exhibited are complex and can be understood only in the context of the actual position of the economy as well as the existing demographical conditions of the state.

**Factor I: Urbanization and Socio-Economic Development**

The first factor which accounts for 46.37 percent of the total variance of social and economic disparities is closely identified with urbanisation and socio-economic development. The nature of the factors is defined by very high loadings for
percentage of urban population to total population (0.98039) followed by percentage of pucca houses to total houses (0.94844), non-agricultural employment (0.90318), Per capita income (0.88631), Bank per lakh of population (0.87899), Hospital Beds per lakh of population (0.86393) and percentage of literates to total population (0.82097). Table 3.4 gives a deep insight of the relationships of factor first. It indicates that urbanization, which is defined in terms of proportion of population engaged in non-agricultural activities, determines social and economic development of West Bengal. In this analysis, it has been observed that almost all indicators of social and economic development are positively associated with urbanization. It shows that the high proportion of work force are engaged in secondary and territory sectors are more predominant in urban areas and are more developed. Affluence and improvement of socio-economic status is positively correlated with educational achievement as it is obvious from positive loading for literates. The developed regions are related with the high level of literacy. The higher the literacy, the greater will the degree of development, as education not only lends confidence to its
## Factor I: Urbanization and Socio-economic Development

### Table 5.4

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Factor Loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td>$X_1$ Percentage of Literates to Total Population</td>
<td>0.82097</td>
</tr>
<tr>
<td>$X_2$ Student Teacher Ratio</td>
<td>-0.18611</td>
</tr>
<tr>
<td>$X_3$ Percentage of Urban Population to Total Population</td>
<td>0.98039</td>
</tr>
<tr>
<td>$X_4$ Hospital Beds Per Lakh of Population</td>
<td>0.86393</td>
</tr>
<tr>
<td>$X_5$ Percentage of Pucca House to Total Population</td>
<td>0.94944</td>
</tr>
<tr>
<td>$X_6$ Percentage of Safe Drinking Water to Total Population</td>
<td>0.34716</td>
</tr>
<tr>
<td>$X_7$ Percentage of Working Force to Total Population</td>
<td>-0.27331</td>
</tr>
<tr>
<td>$X_8$ Percentage of Non-Agricultural Employment</td>
<td>0.90318</td>
</tr>
<tr>
<td>$X_9$ Per-capita Income in (Rs.)</td>
<td>0.88631</td>
</tr>
<tr>
<td>$X_{10}$ Agricultural Productivity per Hectare in (Rs.)</td>
<td>-0.61555</td>
</tr>
<tr>
<td>$X_{11}$ Number of Registered Working Factories</td>
<td>0.26384</td>
</tr>
<tr>
<td>$X_{12}$ Road Density Kilometer/Square Kilometer</td>
<td>-0.26346</td>
</tr>
<tr>
<td>$X_{13}$ Per-capita Electricity Consumption</td>
<td>0.19141</td>
</tr>
<tr>
<td>$X_{14}$ Post office Per-Lakh of Population</td>
<td>-0.63025</td>
</tr>
<tr>
<td>$X_{15}$ Bank Per-Lakh of Population</td>
<td>0.87899</td>
</tr>
<tr>
<td>Percentage of variance explained</td>
<td>46.37%</td>
</tr>
</tbody>
</table>
holders, but also bestows social prestige in addition to being the means of greater earning capacity provided that educational achievement are channelised in correct direction. Per capita income is positively related with the non-agricultural employment and pucca houses. The relationship between these indicators reveals that majority of people living in urban areas are well off and have good quality of houses. It also reflects that rural areas and rural population are much backward socially and economically and the infrastructural facilities available to the rural people is also very poor as compared to their urban counterpart. The negative loading shows just the reverse, that is teacher and student ratio (-0.18611), working force to total population (-0.27331), agricultural productivity (-0.61555) road density per sq km. (-0.26346) and post office per lakh of population (-0.63025).

The standard factor scores have been divided into three grades of high, medium and low for spatial distribution of factor I. Figure 5.1 shows the spatial pattern of urbanisation and socio-economic development. It reveals that area of high scores of socio-economic development are confined in four districts namely Calcutta (23.19), Howrah (6.15), Hooghly
WEST BENGAL
(Factor I)
Urbanization and
Socio-Economic Development

Fig. 5.1
(3.15) and Burdwan (2.04). The regions of high factors scores are found in the surrounding districts of Calcutta.

Similarly on the basis of factor scores the medium score may be observed in two regions. One comprises districts of 24-pargana (1.08) and Nadia (1.52) in the south eastern part of the state and another one in the hilly region of Darjeeling (1.64) and Jalpaiguri (-1.87).

The district recording low factors scores of socio-economic development are Midnapore (-3.24), Bankura (-3.19) Purulia (-5.29), Birbhum (-3.72), Murshidabad (-3.64), Malda (-4.83), West Dinajpore (-4.68) and Cooch Behar (-5.42)

**Factor II: Agricultural Productivity and Infrastructure**

This is the second most important factor explaining 19.90 percent of the total variance and has been identified as agricultural productivity and infrastructure. The rotated factor matrix shown in the (Table 5.5) highlights that the highest positive loading has been recorded for infrastructural development such as per capita electricity consumption (0.84390), followed by road density per sq. km (0.77163) and agricultural productivity per hectare in Rs. (0.60868).
Factor II: Agricultural Productivity and infrastructure

Table 5.5

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Factor Loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td>$X_1$ Percentage of Literates to Total Population</td>
<td>0.15102</td>
</tr>
<tr>
<td>$X_2$ Student Teacher Ratio</td>
<td>-0.00496</td>
</tr>
<tr>
<td>$X_3$ Percentage of Urban Population to Total Population</td>
<td>-0.07732</td>
</tr>
<tr>
<td>$X_4$ Hospital Beds Per Lakh of Population</td>
<td>-0.30413</td>
</tr>
<tr>
<td>$X_5$ Percentage of Pucca House to Total Population</td>
<td>0.08950</td>
</tr>
<tr>
<td>$X_6$ Percentage of Safe Drinking Water to Total Population</td>
<td>0.45890</td>
</tr>
<tr>
<td>$X_7$ Percentage of Working Force to Total Population</td>
<td>-0.44553</td>
</tr>
<tr>
<td>$X_8$ Percentage of Non-Agricultural Employment</td>
<td>-0.06610</td>
</tr>
<tr>
<td>$X_9$ Per-capita Income in (Rs.)</td>
<td>0.05212</td>
</tr>
<tr>
<td>$X_{10}$ Agricultural Productivity per Hectare in (Rs.)</td>
<td>-0.60868</td>
</tr>
<tr>
<td>$X_{11}$ Number of Registered Working Factories</td>
<td>-0.07924</td>
</tr>
<tr>
<td>$X_{12}$ Road Density Kilometer/Square Kilometer</td>
<td>0.77163</td>
</tr>
<tr>
<td>$X_{13}$ Per-capita Electricity Consumption</td>
<td>0.84390</td>
</tr>
<tr>
<td>$X_{14}$ Post office Per-Lakh of Population</td>
<td>-0.19495</td>
</tr>
<tr>
<td>$X_{15}$ Bank Per-Lakh of Population</td>
<td>-0.33987</td>
</tr>
</tbody>
</table>

Percentage of variance explained: **19.90%**
Moderate positive loading has been recorded for percentage of safe drinking water (0.45890) to total population, while the negative loading for banks per lakh of population (-0.33978), hospitals beds per lakh of population (-0.30413), percentage of working force to total population (-0.44553). All the significant variables viewed in a general perspective.

The high positive loading for agricultural productivity per hectare in Rs. is (0.60868). It is an indication of the fact that agricultural productivity is a measure of the level of economic development. Increased agricultural productivity contributes to overall economic development. Among the three significant variables relating to the infrastructural facilities, which exhibited positive loadings are electricity consumption per persons, Road density and availability of safe drinking water to total population, which play very important role in the overall all development of a region. The districts which are agriculturally developed are well served by these infrastructural facilities. This factor has moderate negative loadings for post offices per lakh of population, banks per lakh of population, registered working factories, non-agricultural employment, percentage of working force to total population and hospital beds per lakh of population.
Figure 5.2 shows the spatial pattern of agricultural productivity and infrastructure development. It reveals that the regions with high agricultural productivity and infrastructural facilities are Hooghly (6.21), Howrah (2.14), Burdwan (2.09) and Nadia (2.26).

A large number of district recording the medium factor scores are namely 24-pargana (0.29), Miodnapore (-0.71), Bankura (-1.29) Birbhum (-0.41), Murshidabad (1.46), Malda (-0.40) West Denajpore (-0.73), Darjeeling (-1.29), Jalpaiguri (-1.26) and Cooch Behar (0.54).

There are only two district of high negative score namely Calcutta (-5.29) and Purulia (-3.58).

**Factor III: Industrialization and Education**

The third factor which accounts for 9.63 percent of the total variance can closely be identified as industrialisation and educational development of the state. The nature of the factor is clearly defined by high positive loadings of registered working factories (0.72573) and teacher student ratio
Table 5.6 gives an insight into the variables for factor third that industrialisation and education are most significant factor in determining social and economic development. There is only one strong negative loadings for percentage of working force to total population (-0.76937).

The area which are highly developed and industrialised have also high standard of education. Education is one of the most important factors of socio-economic and politico-economic development. It provides not only economic opportunities and helps to overcome social barriers but also enhances earning potential and productivity of individuals. Education is considered as a leveler of social and economic disparities. The improvement of social and economic status has high positive correlation with educational development. The inclusion of teacher student ratio has been made in order to know the quality of education available to the population. There is a close relation between industrial development and education. The region, which is highly industrialized, the standard of educational development in these areas are also very high. Industrialisation is a key force for rapid development. Due to rapid Industrialisation most of the
Factor III: Industrialization and Education

Table 5.6

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Factor Loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td>$X_1$ Percentage of Literates to Total Population</td>
<td>0.07611</td>
</tr>
<tr>
<td>$X_2$ Student Teacher Ratio</td>
<td>0.13603</td>
</tr>
<tr>
<td>$X_3$ Percentage of Urban Population to Total Population</td>
<td>0.13603</td>
</tr>
<tr>
<td>$X_4$ Hospital Beds Per Lakh of Population</td>
<td>-0.13546</td>
</tr>
<tr>
<td>$X_5$ Percentage of Pucca House to Total Population</td>
<td>0.16867</td>
</tr>
<tr>
<td>$X_6$ Percentage of Safe Drinking Water to Total Population</td>
<td>0.42448</td>
</tr>
<tr>
<td>$X_7$ Percentage of Working Force to Total Population</td>
<td>-0.76937</td>
</tr>
<tr>
<td>$X_8$ Percentage of Non-Agricultural Employment</td>
<td>0.23723</td>
</tr>
<tr>
<td>$X_9$ Per-capita Income in (Rs.)</td>
<td>0.21046</td>
</tr>
<tr>
<td>$X_{10}$ Agricultural Productivity per Hectare in (Rs.)</td>
<td>0.22917</td>
</tr>
<tr>
<td>$X_{11}$ Number of Registered Working Factories</td>
<td>0.72573</td>
</tr>
<tr>
<td>$X_{12}$ Road Density Kilometer/Square Kilometer</td>
<td>0.25439</td>
</tr>
<tr>
<td>$X_{13}$ Per-capita Electricity Consumption</td>
<td>-0.27948</td>
</tr>
<tr>
<td>$X_{14}$ Post office Per-Lakh of Population</td>
<td>-0.03202</td>
</tr>
<tr>
<td>$X_{15}$ Bank Per-Lakh of Population</td>
<td>-0.20142</td>
</tr>
</tbody>
</table>

**Percentage of variance explained** | **9.63 %**
infrastructure facilities, such as schools, hospitals, means of transport and communication, power and banking institutions expand in the area. In such areas favourable teacher student ratio may be due to the fact that besides government and private schools are established by the big industrial establishment have also their own schools. Thus pressure of students on government schools is reduced by schools of different Industrial units.

Spatial distribution of factor third is depicted in Figure 5.3, which indicates that there is a large and compact region of high factor score around Calcutta. It comprises the district of Calcutta (2.43), Howrah (4.07) and 24-pargana (4.94).

Majority of the districts recording category of medium factor score are Midnapore (-1.27), Hooghly (0.33), Burdwan (0.98), Birbhum (-0.15), Murshidabad (-0.25), Malda (-0.96), West Dinajpore (-1.79) Darjeeling (0.38), Jalpaiguri (-0.43) and Cooch Behar (-1.02).

There are only two districts namely Bankura (-3.10) and Purulia (-4.94) which record low factor scores of this dimensions and form a contiguous region.
Figure 5.4 shows regional pattern of social and economic disparities in terms of overall development in West Bengal. The general picture that has emerged reveals that the marked inter-district disparities exist in the study area. There is a small region of high development in the south-east, comprising the district of Calcutta (6.77), Howrah (4.12), Hooghly (3.23) and 24-Pargana (2.37). Calcutta and its surrounding districts enjoyed each and every type of infrastructural facilities because Calcutta was the capital city of the colonial rule in India. Even after independence, this region attracted new industries, trade and commerce and other amenities and facilities leading to development due to its previous advantages. The agglomeration of big industries, their ancillaries and other infrastructural facilities available in this region may also be attributed the nearness of Calcutta port to this region for international trade, its accessibility by railways and roads from other parts of the country and also nearness to the mineral rich belt of Chota Nagpur plateau. The overall development of this region is contributed by very high score of urbanization (3.16), industrial development (3.36), literacy (2.13), per capita income (2.47) and energy.
WEST BENGAL
Over all Socio-economic Development
1991

Fig. 5.4
consumption (3.65) etc. The region attracted the entrepreneurs, skilled and semi-skilled labourers from the neighbouring state like Bihar, Orissa and also from eastern Uttar Pradesh.

About fifty percent of the districts record the medium level of social and economic development and forms two distinct regions. One lies in the hilly region of Northern districts of North Bengal, Darjeeling (0.24), Jalpaiguri (-1.19) and Cooch Behar (-1.96) and another region lies in the Southern plains of lower Ganga basin comprising the district of Burdwan (1.71), Midnapore (-1.74), Nadia (0.51), Birbhum (-1.42), Murshidabad (-0.80).

There are four districts having low level of social and economic development. Two of them lie in the south western part of the state comprising the districts of Purulia (-4.60) and Bankura (-2.77) while remaining two districts namely Malda (-2.06) and West Dinajpore (-2.46) lie between the northern mountain and southern plains. The backwardness of these districts may be on account of their poor natural resource base, low level of agricultural development but higher dependency on this sector, lesser industrialisation, over population and natural hazards like floods and drought.
CHAPTER 6

CONCLUSION AND SUGGESTIONS
CHAPTER 6

CONCLUSION AND SUGGESTIONS

The basic findings of the foregoing study shows that there are wide inter-district disparities in the level of socio-economic development in West Bengal. The highly developed areas are small in extent and are largely confined to the south Bengal comprising the district of Howrah, Calcutta, Burdwan and 24-Pargana. While remaining districts are extremely backward with some exceptions in the case of Darjeeling and Hooghly district which are moderately developed. The main reason for high level of development may be attributed to their higher degree of Industrialisation and urbanisation. They are developed due to the advantage of being located in one of the richest mineral belts of India and also previous advantages, of big industrial complexes like Durgapur, Asansol, Hooghly, Calcutta and Haldia port which lie in this region. There is also good accessibility of railways, roads, and location of DVC Hydel Power Plants, and many other Thermal Power Plant.

On the other hand the underdeveloped regions lie in the south western part and between north and south Bengal. The
south western region comprises the districts of Purulia and Bankura while the other backward regions include the district of Malda and West Dinajpore. Their under privileged conditions can be attributed to the fact that these districts are agriculturally as well as industrially backward. Agricultural productivity is low, the size of the land holdings are small, and too many people are dependent on farming. Farmers do not adequately use the modern inputs such as chemical fertilizers, insecticides, pesticides, assured means of irrigation and modern agricultural tools and implements to raise the productivity. This region is also facing the problems of drought and flood, as a result crops are destroyed almost every year. These districts also lack in urbanization, industrialisation and infrastructural facilities, that leads to their backwardness. All these factors have increased the gap in the level of development between developed and backward regions. Thus, there are a few islands of developed area in the vast ocean of either moderately developed or underdeveloped areas.

The main thrust in this analysis is to identify the backward districts in terms of selected variables. The following districts have been identified as backward, and
depicted in the table 6.1. There is an urgent need to pay special attention to develop these districts.)

Table: 6.1 Identification of backward districts in terms of selected indicators based on Z-score

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Backward district</th>
</tr>
</thead>
<tbody>
<tr>
<td>Literacy</td>
<td>Purulia, Birbhum, Murshidabad, Malda, West Dinajpore, JalPaiguri, Cooch Behar</td>
</tr>
<tr>
<td>Teacher-student ratio</td>
<td>Hooghly, Bankura, Purulia, West Dinajpore, Cooch Behar, Calcutta</td>
</tr>
<tr>
<td>Urbanization</td>
<td>Midnapore, Bankura, Purulia, Birbhum, Murshidabad, Malda, West Dinajpore, Cooch Behar</td>
</tr>
<tr>
<td>Hospital beds</td>
<td>Midnapore, 24-pargana, Cooch Behar</td>
</tr>
<tr>
<td>Pucca Houses</td>
<td>Bankura, Purulia, Midnapore, Birbhum, Malda, West Dinajpore, Cooch Behar</td>
</tr>
<tr>
<td>Safe drinking water</td>
<td>Bankura, Purulia, Jalpaiguri, Darjeeling</td>
</tr>
<tr>
<td>Work force</td>
<td>24-pargana, Calcutta, Howrah, Hooghly, Burdwan, Nadia, Murshidabad.</td>
</tr>
<tr>
<td>Non-agricultural employment</td>
<td>Midnapore, Bankura, Purulia, Birbhum, Murshidabad, Malda, West Dinajpore, Cooch Behar</td>
</tr>
<tr>
<td>Per-Capita income</td>
<td>Midnapore, Nadia, Malda, West Dinajpore, Jalpaiguri, Cooch Behar</td>
</tr>
<tr>
<td>Agricultural productivity</td>
<td>Purulia, Jalpaiguri, Cooch Behar</td>
</tr>
<tr>
<td>Registered working factories</td>
<td>Bankura, Purulia, Birbhum, Murshidabad, Malda, West Dinajpore, Cooch Behar</td>
</tr>
<tr>
<td>Road density</td>
<td>24-Pargana, Midnapore, Bankura, Purulia, Jalpaiguri</td>
</tr>
<tr>
<td>Electricity consumption</td>
<td>West Dinajpore, Cooch Behar, Malda, Murshidabad, Bankura</td>
</tr>
<tr>
<td>Post Office</td>
<td>Calcutta, Howrah, Hooghly, Nadia, Murshidabad, West Dinajpore, Jalpaiguri</td>
</tr>
<tr>
<td>Bank establishment</td>
<td>24-pargana, Nadia, Murshidabad, West Dinajpore, Jalpaiguri</td>
</tr>
</tbody>
</table>
The factorial analysis of the regional disparities in the study area has shown three dimensions, (i) Urbanisation and Socio-economic development, (ii) Agricultural productivity and Infrastructure (iii) Industrialisation and Education.

The first factor, urbanisation and socio-economic development accounts for 46.37 per cent of the total variance. The nature of factor loadings indicates that almost all the factors of socio-economic development are positively associated with urbanisation. The indicators which have very high positive loadings with urbanisation are Pucca house to total houses, Banks per lakh of population, per capita income, literacy, Hospital beds per lakh of population and non-agricultural employment. This factor shows that there are concentrations of amenities and facilities in urban centers and they are more socially developed than their rural counterpart.

The spatial pattern of the first factor shows that the areas of very high scores of socio-economic development are Calcutta, Howrah, Hooghly and Burdwan. The backward districts in terms of socio-economic development are Purulia, Bankura, Birbhum, Midnapore, Murshidabad, Malda, West Dinajpore and Cooch Behar.
The second dimension is agricultural productivity and infrastructure explains 19.70 percent of the total variance. It indicates that heavy inputs in the form of irrigation facilities, fertilizers, high yielding varieties of seeds, intensive cropping and mechanisation of agriculture has direct bearing on productivity and yield per hectare has increased. Besides this infrastructural facilities has also developed tremendously especially, availability of electricity, transport and communication etc.

The spatial pattern of this factor reveals that the regions with high agricultural productivity and infrastructural facilities are Hooghly, Burdwan, Howrah and Nadia. The most backward district in this regard is Purulia, where development of agriculture over the western plateau region is poor, because of the rocky laterite soil and scarcity of water.

The third factor is labeled as dimensions of Industrialisation and Education. It accounts for 9.63 percent of the total variance. There is a close relationship between Industrialisation and education. The region, which is highly industrialized, the standard of educational development in these areas are also very high. Industrialisation is a key force for rapid development. Due to rapid Industrialisation most of
the infrastructural facilities, such as schools, hospitals, means of transport and communication, power and banking institution expand in the area. In such areas, favourable teacher-student ratio may be due to the fact that besides government and private schools, the big industrial establishment have also established their own schools. Thus the burden of students on government schools is also shared by schools of different Industrial units.

Spatial variation in terms of third factor shows that there are large area around Calcutta which are highly developed, educationally as well as industrially. These districts comprise of Calcutta, Howrah, and 24-Pargana. There are only two districts namely Bankura and Purulia which are highly backward.

It can be put forward that the disparity exists because of natural, historical, economic and social reasons. Allocative mechanism also involved in the spatial distribution of developmental resources, invariably operates in favour of the developed regions, with the result that, the economic reward accruing to different regions are unequal. Political factors also play an important role not only for allocation of resources but also for their implementation.
A bold step should be taken for the removal of backwardness from the region which are lagging behind. The analysis indicates a number of directions which should be initiated to improve the level of development and to minimise the inter-district disparities in West Bengal. It is desirable that the region which lag behind in industrial development and are bereft of infrastructure, local or regional industries (small scale, and agro-based) instead of large projects have to be developed in northern regions (Darjeeling, Jalpaiguri and Cooch Behar), north central regions (Nadia, Murshidabad, Malda and West Dinajpore regions Midnapore, Purulia, Bankura and Birbhum) of the state. This may bring about some equity in the level of development and better functional integration of industrial centers can be achieved.

Since agriculture is the backbone of the majority of the population in the region, it should be given a high priority. Agricultural operation in Bengal is still by and large dependent on the vagaries of nature. Therefore, more stress should be given to (i) Availability of inputs such as assured means of irrigation, improved seeds, fertilizers and insecticides and pesticides and (ii) Developed agricultural infrastructural facilities such as financial institutions, agricultural marketing, agricultural loans and subsidies and
modern tools and equipments of farming. These measures would ultimately increase the productivity and diversify the agriculture in the state.

One of the basic objectives of our national as well as state plans have been the removal of regional disparities. In consonance with the above objective, efforts have continuously been made in the successive five year and annual plans of the state to reduce the existing inter-regional disparities. The reasons lie both at the conceptual as well as the implementation levels. It is very important to devise policies in such a way that it should help to improve the well-being of the backward districts. It is political will and social commitment which can only bring about changes for the betterment of the region. Yet the level of development between the backward and developed areas have not been removed in successive five year plans. Though the planning processes both at the regional as well as the Sectoral level have stimulated considerable economic development in absolute terms.

Presently, formulation of district plan is done at the district level, it should be in the fitness of things to formulate it at the lowest unit of planning in the state i.e. at the Block level, so that local resources can be utilised and the real benefits shall reach the grass root level.
For a balanced and meaningful development of the state and to reduce the gap between the districts, more attention should be given on agricultural as well as Industrial development. Higher agricultural productivity through improved methods of cultivation should be attained. Therefore, a high priority of investment must be given to agriculture. The diversification of industrial sector to the backward regions is the need of the hour.

The development of infrastructure is required to industrialise the comparatively backward areas. This is so because infrastructural development like electricity, roads, railways, banks and post offices assume great significance. Such developments bring about other economic activities and hence, investment in infrastructure has to be made in anticipation for future development.

Effective adult education and vocational training in the backward districts should be promoted to provide incentives for education through job-oriented courses in order to provide employment opportunities in the backward areas.

There should be provision of better medical facilities in the remote areas, so that under privileged people can be benefited from the fruits of development. So direct investment by the government in the backward regions is needed.
With the liberalisations of economy, a conducive atmosphere should be created to attract the foreign capital investment and it should be diverted to the backward districts.
BIBLIOGRAPHY
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Books

Agarwal, A.N. : Indian Agriculture and its problem, New Delhi, 1953.


Ahmad, Q. : Indian Cities: Characteristics and Correlates, Research paper No. 102, The Dept. of Geography, University of Chicago, 1965.


Andre, B. : Equality and Inequality, Oxford University Press, Delhi, 1983.

Andre, B. : The Idea of Natural Inequality and Other Essays, New Delhi, 1983.


<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Title and Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bose, S.C.</td>
<td>Geography of West Bengal, National Book Trust, India, New Delhi, 1968.</td>
</tr>
</tbody>
</table>


Hoyle, B.S : Spatial Aspects of Development, John Wiley and Sons Ltd. 1978.


Majumdar, D.N. : Races and Cultures of India. Asia Publishing House, Bombay, 1981.


Patel, M.L. : Dilemma of Balanced Regional Development in
India, Bhopal, 1975.


Singh, P.L. : A Regional Geography of India, National Geographical Society of India, Varanasi, 1971


Bardhan, P.K.


Journals


Dadibhavi, R.V. : Why these inter-state Disparities Yojana, Vol. 31,
No. 11, June, 1987.


Loronz, M.O. : Method of Measuring the Concentration of


<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parsky, J.</td>
<td>Techno-Economic Survey of West Bengal</td>
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</tbody>
</table>