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

\[ z = \frac{x - \mu}{\sigma} \]
\[ Z_i = \frac{X_i - \overline{X}}{SD} \]

where,

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

The 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 indicator's 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 edifies 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).
WEST BENGAL

Literacy

1991

Fig. 4.1
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
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

Fig. 4.3

Z-Score
+ 0.4
- 0.4

H
M
L
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.
WEST BENGAL
Medical Facilities
1991

Z-Score
-0.4
+0.4

Fig. 4.4
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  + 0.4
M  - 0.4
L

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).
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

Z-Score
H
+ 0.4
M
L
- 0.4

40 20 0 40
KM

198
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 an 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

Z-Score
H
+ 0.4
M
- 0.4
L

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
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.