CHAPTER VII
SUMMARY AND CONCLUSION

In this chapter three subsections have been included

i) Population regions

ii) Major findings, and

iii) Suggestions.

POPULATION REGIONS

Geographers have always been concerned with regions and have often examined the possibilities to regionalize on the basis of various parameters of population like distribution, density, growth rate, urbanization, sex ratio, backward population, literacy, workers, etc. However, the main difficulty is that the parameters of population are measured in different scales, so these may not be comparable and secondly, the parameters influence population directly or indirectly. Thus the quantification in terms of standardization be made accordingly. The following parameters of population have been examined and their nature of influence have been ascertained for evolving a regional division of Tripura on the basis of population.

Parameters included:

1. Total population of the block which exerts direct influence.
2. Population density a direct parameter.
3. Sex ratios an inverse indicator.
4. Urban population a positive factor.
5. Workers also influence directly.
6. Growth of population is a negative indicator.
7. Child population (<6 years) is also a good negative factor.
8. Literacy is a direct factor.
9. Backward population is a negative indicator.

Standardization of Population Parameters

The various parameters of population are measured in different scales. Moreover, in different elements variations are highly pronounced, so, to standardize them the following steps have been taken:

1) The parameters have been arranged in descending or ascending order according, as they influence inversely or directly.

2) The four percentiles i.e. 35 %, 45 %, 55 % and 65 % have been computed.

3) The scaling has been employed in the following manner:

<table>
<thead>
<tr>
<th>Percentile</th>
<th>Score point</th>
<th>Type</th>
</tr>
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<tbody>
<tr>
<td>i) &lt;35 %</td>
<td>30</td>
<td>very low</td>
</tr>
<tr>
<td>ii) 35 % to 45 %</td>
<td>40</td>
<td>Low</td>
</tr>
<tr>
<td>iii) 45 % to 55 %</td>
<td>50</td>
<td>Medium</td>
</tr>
<tr>
<td>iv) 55 % to 65 %</td>
<td>60</td>
<td>High</td>
</tr>
<tr>
<td>v) &gt;65 %</td>
<td>70</td>
<td>Very high</td>
</tr>
</tbody>
</table>

4) The score points being ascertained for each parameters of the individual block have been summed up and divided by the number of parameters to obtain the composite score of each block.
5) On the basis of the composite scores, the blocks of Tripura have been grouped into various classes as desired.

**Table 7.1: Scales for population parameters**

<table>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>35%</td>
<td>132920</td>
<td>232.50</td>
<td>&lt;945</td>
<td>&lt;4.96</td>
<td>&lt;28.95</td>
<td>&gt;19.05</td>
<td>&gt;18.61</td>
<td>&lt;43.25</td>
<td>&gt;60.16</td>
</tr>
<tr>
<td>45</td>
<td>45%</td>
<td>147080</td>
<td>282.50</td>
<td>947</td>
<td>8.04</td>
<td>29.24</td>
<td>17.35</td>
<td>18.27</td>
<td>48.25</td>
<td>56.63</td>
</tr>
<tr>
<td>55</td>
<td>55%</td>
<td>166875</td>
<td>333.75</td>
<td>949</td>
<td>9.46</td>
<td>29.48</td>
<td>15.65</td>
<td>17.86</td>
<td>50.96</td>
<td>51.63</td>
</tr>
<tr>
<td>60</td>
<td>65%</td>
<td>&gt;188125</td>
<td>&gt;376.25</td>
<td>&gt;953</td>
<td>&gt;11.31</td>
<td>&gt;29.72</td>
<td>&lt;9.92</td>
<td>&lt;17.71</td>
<td>&gt;52.18</td>
<td>&lt;44.75</td>
</tr>
</tbody>
</table>

*Source: Calculated by the author*

On the basis of the scale, the score points have been ascertained for each parameter of the blocks. These score points have been added and divided by the number of population parameters (nine) to obtain the composite score for each block. Accordingly the following Population Regions have been identified in Table 7.2 and Fig. 7.01.

**Table 7.2 Regional Classification of Blocks**

<table>
<thead>
<tr>
<th>Regions</th>
<th>Composite score</th>
<th>Blocks (Number)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very highly developed</td>
<td>&gt;60</td>
<td>Bishalgarh, Mohanpur, Panisagar (3)</td>
<td>17.65</td>
</tr>
<tr>
<td>Highly developed</td>
<td>55</td>
<td>Khowai, Kumarghat, Matabari (3)</td>
<td>17.65</td>
</tr>
<tr>
<td>Moderately developed</td>
<td>45</td>
<td>Teliamura, Jirania, Bagafa, Salena (4)</td>
<td>23.53</td>
</tr>
<tr>
<td>Backward</td>
<td>&lt;35</td>
<td>Melaghar, Kanchanpur, Amarpur, Rajnagar, Satchand (5)</td>
<td>29.41</td>
</tr>
<tr>
<td>Highly Backward</td>
<td></td>
<td>Chhamanu, Dumburnagar (2)</td>
<td>11.76</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>17</td>
<td>100.00</td>
</tr>
</tbody>
</table>

*Source: Grouped by the author*
1) Very Highly Developed Region

Bishalgarh and Mohanpur blocks of West and Panisagar in the North are included in the highly developed region. These blocks have very high scores particularly in population density, urban population, literacy, backward population, etc. These blocks are highly accessible, locating a number of urban centers with all infrastructural facilities like educational, medical, trade and commerce, etc.

2) Highly Developed Region

Khowai in the West, Matabari in the South and Kumarghat in the North are the three blocks located separately as highly developed. Khowai located in close proximity of Agartala is highly accessible and infrastructural facilities are better. Matabari block includes in the district town of Udaipur where the most famous temple Tripureswari is located. As a result it is accessible from different corners of the state. Kumarghat is the block which is located on the only railway line and the National Highway, directly connected to the adjacent state of Mizoram and Assam.

3) Moderately Developed Region

Four blocks are grouped in moderately developed category, of which Teliamura and Jirania are in the West, Bagafa in the South and Salema in the Dhalai District. These blocks are not highly accessible but some parameters are favourable, so these blocks are moderately developed.
4) **Backward Region**

Five blocks have been grouped in the backward region. These includes Melaghar in the West, Amarpur, Rajnagar and Satchand in the South and Kanchanpur in the North. These blocks are backward as the growth rate, sex ratio are higher, urban population is lower, tribal population is higher and accessibility is lower, all these are responsible for the backwardness of the blocks.

5) **Highly Backward Region**

Chhamanu and Dumburnagar are the two blocks of Dhalai, which are distinguished as highly backward region. These blocks located in hilly terrain which are densely forested and very inaccessible as a result, are highly backward in various parameters.

**MAJOR FINDINGS**

**Geographical background**

Tripura is one of the smallest states of India with an area of 10491.69 sq.km. and a total population 3191168 in 2001. Nearly two third of the area is hilly leaving very little cultivable land. Land scarcity is aggravated by severe and intensive land degradation. Tripura is densely populated with a density of 304 persons per sq. km.

Administratively Tripura is devided into 4 districts – West, North, Dhalai and South which are further subdivided into 38 blocks.
Physiographically Tripura represents the western fringe of the typical “ridge and valley” province of the late tertiary fold mountain belt commonly known as ‘Indo Burma Ranges’. The height of hill ranges varies from 249 m to 939 m from west to east. However, the general altitude differs between 750 m to 15 m from M.S.I. In some places the terrain is inaccessible and highly undulating. The lunga land (Longitudinal valleys) are juxtaposed in between the numerous tilla lands which are the fertile agricultural lands. They are well known for paddy cultivation as the recharge capacity of ground water is very high. Jhumias use the major hill ranges for shifting cultivation.

The state is characterised by subtropical climate with three distinct seasons: such as summer, monsoon and winter. The state receives more than 2000 mm of rainfall during monsoon (June to September). The average maximum temperature is 35 °C and the average minimum is 10 °C. The relative humidity is as high as 85 % during rainy seasons, and 50 to 75 % during summer.

The humid tropical climate of Tripura has given rise to five broad groups of soil viz. Sandysoil, Sandyloam, Older alluvium, Younger alluvium and laterites.

Concentrated rainfall causing flash floods and rapid deforestation have aggravated soil degradation. According to Government of Tripura, about 95 % area of the State are suffering soil erosion.
The State is blessed with numerous river systems. Major among them are: Longai, Juri, Deo, Dhalai, Khowai, Haora, Gumti, Muhuri and Fenny. However, most of the rivers are rainfed and their flow is directly related to the rainfall. Most of the rivers originate on the hill ranges of Tripura and after traversing a distance of 100 to 150 km, finally outfall in Bangladesh.

**Distribution and density**

The population of Tripura has increased to 3191168 in 2001, registering a growth rate of 15.74% during 1991 to 2001. Of the total population 82.98% are rural and the rest 17.02% are living in 23 urban areas. This reflects that the State is proverbially rural and urban development has been very slow. The economy is based mainly on agriculture.

In 2001, the state has been divided into 4 districts and 38 blocks. In majority of the cases old blocks have been subdivided to create new blocks. In few cases the new boundaries do not conform to the old boundaries, as a result the comparison has become very difficult.

The distribution of population is extremely uneven. North-western and Southern blocks are highly populated but the hilly and forested areas of South-east are very sparsely populated. The distribution of rural population reflects to that of total population. The plain areas of West show very high rural
population. The rural-urban differentiation is very low in West. Very high density zone is found in the West, surrounding the capital city Agartala. On the other hand high density zone is found in three separate pockets in the West, South and North. Hilly areas in the North are sparsely populated.

High population concentrations are found in separate locations, viz. western zone surrounding Mohanpur, Dukli and Khowai forms a small pocket in the west-central and around Kadamtala in the North-east.

Due to the backwardness of the blocks the potentials of populations are much lower than their actual population. The potential population decreases from Agartala to the north-east, east and south respectively.

Population change

It is observed that initially it took 40 years (1901-1941) to multiply population three times, in the second stage it increased to three times in 30 years (1941-1971) and finally it has doubled in 30 years (1971-2001). So the average rate of change is declining.

Growth of rural population is fluctuating in Tripura. In earlier decades (1901-1931) the growth rate of rural population was higher than that of the total population. Afterwards the growth of rural population was lower compared to those of total population.
The vital rates (fertility and mortality) gradually increased both in rural and urban sectors from 1981 to 1987, and afterwards (1987-2000) these rates decreased steadily. It is observed that vital rates were higher in rural areas than in urban areas.

The immigrants decreased from 24.34 % in 1981 to 17.44 % in 1991. However, the male migrants were higher than the female migrants. It is observed that the males migrated for economic opportunities but for the females marriage was the main reason for immigration.

Estimated population for 2011 has shown an increasing trend, but majority of the blocks have shown a moderate increase.

Population composition

In case of Tripura the sex ratio has shown an increasing trend from 874 females per 1000 males in 1901 to 950 females per 1000 males in 2001. Rural sex ratios are lower compared to urban sex ratios in 2001. Tripura represents the "progressive" type of age-sex pyramid. As a whole males are larger (51.42 %) than the females (48.58 %). The age-sex structure as measured by regression equation reveals that slope of the line ranges between 0.15 to 0.18 indicating old and young respectively. The dependency ratio was 75.86 % for Tripura as a whole which was slightly lower in West Tripura district. The marital status reveals that married females are slightly higher than their males.
counterpart in Tripura which may be due to the fact that polygamy is still in existence particularly for the tribals.

The literacy rate has been increasing steadily in Tripura from 2.30 % in 1901 to 73.66 % in 2001. At present the literacy rate for males are higher(81.47 %) compared to females (65.41 %). However, rural literacy rates are lower than those of urban areas. Again variations of literacy are significant from north to south as well as from west to east. Male-female differentiation in literacy is pronounced in the south than in the north.

The main workers are very low and they have not changed significantly. However, male workers are much higher than female workers indicating backward economy. Diversification of occupation is pronounced in the north-west than in the north-east and south-west. Total backward population consisting of scheduled caste and scheduled tribes have been increasing steadily from 37.35 % in 1951 to 47.31 % in 1991.

From the religious point of view Hindus are predominant followed by Muslims and others. The Hindu population was 74.99 % in 1951 which increased to 86.50 % in 1991. For Muslims, the situations were reversing from 21.21 % in 1951 to 7.13 % in 1991. This is mainly due to the fact that after the independence of Bangladesh in 1971 many Muslims families had migrated to Bangladesh.
Urbanization and urban development

In 1901, Agartala was the only urban center in Tripura with 3.7% of the total population but in 2001 the number of urban center increased to 23 where 17.02 percent of the total population were concentrated. This indicates that pace of urbanization is very slow in Tripura and the state is predominantly rural. The spacing of urban center is also as high as 12.913 km on an average. The urban centers are randomly distributed as revealed by “Nearest Neighbour Analysis”. The spatial distribution of urban population indicates that in the north-west it is very high and from south-west to north-east the urban population is moderate which forms a belted pattern with intervening low and very low distributions on either side. During 1991 to 2001 western blocks have shown high urban growth (> 20 %) and the central blocks have shown low urban growth whereas Teliamura has shown a decreasing tendency due to re-classification.

The size class analysis of urban centers, shows that Agartala was upgraded to class I city only in 1981 which maintained its top position even in 2001 with a population of 189327. Since 1981 there was no urban centers in class II in Tripura, indicating that the urbanization in Tripura centered around Agartala. In 2001 seven new urban centers have been established and the total number of towns increased to 23. The inequality in the distribution of urban population as studied by Lorenz-curve and quantified by Gini Co-efficient reveals that an inequality to the extent of 49.08 % is observed.
The rank size indicates that Agartala has developed more due to migration from rural to urban areas. The middle order urban centers (Class III) have not grown to the desired extent, class IV urban centers have grown more whereas class V urban centers have not grown due to their backwardness and inaccessibility.

Functional specialization of urban centers demonstrates that the urban centers are specialized in one to three functions. Agriculture is specialized in seven towns indicating their rural character whereas only six urban centers are specialized in manufacturing indicating that industrially the towns are lagging behind.

**Agartala, the capital city**

Agartala grew at a slow but steady rate with fluctuations and during 1991-2001 it registered a growth of 20.10 %. The average population density is slightly less than 12500 persons / sq.km, which ranges between 8443 persons / sq. km. in ward 3 to 28603 persons / sq. km. in ward 13. The central wards are more dense than those of peripheries.

Urban morphology of Agartala reveals the predominance of residential areas (38.40%), followed by roads (20.74%) and open spaces (14.23%). Industrial and recreational area need to be improved.
Population and its relation with selected factors

Population of Tripura is growing at a first rate, so that pressure of population on land and resources has become very alarming. The bivariate correlation and regression analysis reveals that the physical factors play a very important role in explaining the variations of population pressure in Tripura. The social and cultural factors also explained a significant proportion of population pressure but the infra-structural factors have explained moderately the pressure of population. The correlation co-efficients are significant even at 1% level. The estimated population densities suggest that forest cover, agricultural land and backward population are highly associated with the population density in different blocks of Tripura.

Multivariate correlation and regression

By employing multivariate techniques it is observed that out of 12 variables which were tested, only five have been highly and significantly associated with density of population in Tripura. These are Agricultural land, Drainage density, Backward population, Electrified villages and Urban population. The resulting correlation co-efficient is as high as 0.97974 which indicates that the relationship is positive and the magnitude is very high. These five variables explained 96% variations of population density in Tripura, so the remaining 7 variables are less significant as they explain only 4% of the variations of population density.
SUGGESTIONS

The present study "Population of Tripura – A Geographical Analysis" has been carried out with adequate quantification, followed by cartographic representation and statistical inferences. In course of the study two major problems have seriously affected the progress of the work:

i) The administrative subdivisions from 1991 to 2001 have made the comparison difficult.

ii) The inordinate delay in the publication of 2001 census, particularly backward population, workers and occupational classification, age classification and migration patterns have not yet published for Tripura.

During independence of India (1947) the tribal people practiced shifting cultivation or jhuming which could hardly add anything to its economy. The hilly and forested terrains of Tripura played a negative role in the economic development of the state.

After partition of Bengal, the railway connection with the rest of the main land was snapped. The only road that connect the state with the rest of the country 200 km long, Agartala-Assam road. Apart from air service this road technically a National highway (No. 44), the only link remains closed very often particularly during monsoons due to land slides in the hilly sections. The road transport, particularly the intra-state communication has improved substantially in recent years. The
extension of railway line from Manu to Agartala is an urgent necessity.

A periodic recurrence of flood is another serious problem faced by the people of Tripura. The winding courses of the rivers frequently causes bank erosion, thereby threatening the nearby settlements. Concrete embankments may be constructed in the stretches of the river banks susceptible to breaches due to flooding and subsequent erosion.

Tripura is characterised primarily by agrarian economy which contributes 42% of SDP (State Domestic Product) and 64% of employment. Application of high yielding varieties with extension of irrigation facilities may improve the situation. Development of horticulture and plantation corps like rubber and tea may improve the economy. Tilla and Lunga land may be improved by proper agricultural planning.

Tripura is an industrially backward state, gainfully employing less than 7% of the workers. Agro based industries like food processing, forest based industries like lumbering, paper and pulp, plywood industries may be developed to enhance the economy. Moreover, cottage industries in the form of handloom and handicrafts may be extended.

Other small scale industries like plastic goods, soap making, cosmetics, confectioneries etc. may be established, particularly on the less utilized tilla lands may improve the economy of the people of the state.
Regional planning may be properly executed to develop the different population regions into which Tripura has been divided. Sectoral planning may be undertaken on priority basis particularly transportation, road construction, electrification, establishments of educational institutions, hospitals and primary health centers, distribution centers of standard seeds, pesticides and chemical fertilizers may improve the overall economic upliftment of the state.

The hilly and forested areas inhabited by tribals and other backward communities may be developed by extending safe drinking water, facilities for educational and medical institutions may improve a lot for the backward areas of Tripura. Public distribution system of essential commodities, particularly during flood, earthquake and other natural hazards and disasters, may mitigate the sufferings of the affected people.

All these will lead to the sustainable development of the area in which the inhabitants themselves will have to be involved.

Finally it may be concluded that:
1) The major objectives of the study i.e. spatial patterns of distribution and density of population and their causative relationship with other factors have been clearly demonstrated.
2) The growth patterns as influenced by fertility, mortality and migration have been analyzed systematically.
3) Population regions on the basis of some population parameters have been constructed by quanto-cartographic techniques.
4) Stepwise multiple correlation indicates that out of 12 selected variable only 5 have been highly and significantly associated with density of population in Tripura, so that 96% of the variations of density are explained.