CHAPTER I

INTRODUCTION

Nature of the study

Population studies have for long been the subject of concern for social scientists including geographers. The study of population distribution has been the focus of traditional human geographers since long. In recent decades there has been progressive reorientation of viewpoint, with increasing emphasis upon man as the main inhabitant of the earth.

"Population of Tripura – A Geographical Analysis" is concerned with demonstrating how spatial variations in the distribution, composition, migrations and growth of population etc. are related to environmental situations in different places. This topic is concerned with a quantitative study of the size, structure, characteristics and territorial distribution of human population and the changes occurring in them.

India has a massive population which has been growing at an alarming rate throughout the post independence periods. According to Census of India, 2001, the population of India was 1027 million. It had its paralyzing effects on all attempts towards the socio-economic development of the country. It provides the author the stimuli for population analysis. The investigation has been undertaken to explain some geographical factors in association with population of Tripura which brings out man-environment relationship. It is expected that through the study the author will be able to serve the researchers,
planners and administrators for future socio-economic planning of Tripura.

**Previous literature**

A keen interest in population study had been shown by many geographers from the middle of the seventeenth century. Most of the early development took place in England, France, Germany and a few other European countries. Afterwards American geographers contributed substantially towards the development of this discipline.

John Graunt (1662) an English man who is generally acclaimed as the Father of the Population Studies, has postulated mainly a quantitative analysis of mortality, fertility and migration.


Another important contribution to the advancement of the population studies was made in London, after thirty years Edmund Halley (1665-1742), an English astronomer who constructed the first empirical life table, based on the data of the births and deaths. He used the term “Expectation of life”.

Most of the development took place in the nineteenth and twentieth century. Glenn T. Trewartha (1953) while delivering his presidential address in front of American geographers mentioned
Population Geography stimulated geographers to study man, an area characterizing and area differentiating element.

In France, Garnier J. Beaujeu (1966) brought out a volume on Geography of Population in France which was later translated in English. Where by she considered the description of demographic facts in their present environmental context, studying also their causes, their regional characteristics and possible consequences as the foremost business of Population Geographers. According to her, geographic analysis of population was confined to three main aspects.

i. the distribution of population;

ii. the evolution of human societies; and

iii. the degree of success which they have achieved.

Preston E. James (1960) recognized four major aspects of population studies, these are:

i. the development of more satisfactory methods for mapping the distribution of population;

ii. the reconstruction of past population pattern;

iii. the search for methods revealing more clearly the dynamics of population change; and

iv. the correlative studies of cultural characteristics of population with other geographic phenomena.

Zelinsky, W. (1966) the famous American geographer contributes that the human characteristics fall into three groups:
i. absolute numbers which is subdivided into (i) Total, (ii) Rural, (iii) Urban with parameters like persons, males and females.

ii. population characteristics classified into (i) Physical – age, sex, etc. (ii) Social-martial status, households, literacy, ethnic group, etc. (iii) Economic – workers, income, etc.

iii. population dynamics – i.e. growth and variation caused by fertility, mortality and migration.

According to John I. Clarke (1965), Geography of Population is concerned with demonstrating how spatial variations in distribution, composition, migration and growth are related to the spatial variations in the nature of places.

Melezin, A. (1967) a Soviet Geographer described Population Geography as “the study of Population distribution and productive relationships existing within various population groups, the settlement network and its fitness, usefulness and effectiveness are the productive goals of a society.

Edward A. Ackerman (1970) an American geographer has very clearly explained the distinctive role of geography in population analysis and delimited the problems of population geography at various levels.

Marxists are of the opinion that man and his social organizations are the measures and dominating factors of human existence. They also consider that the productive aspects of population are the most important in the distribution of population. It also includes the rural and urban
settlements, historical aspects of population, ethnographic studies and the labour resources.

An extensive coverage to spatial distribution of population, ethnic, demographic and socio economic diversity of population, spatial mobility, relationship between population and resources, population policies and models, have been given by Woods (1979) and Jones (1981) and others.

In India, Gosal, G.S. (1956) made an attempt to do a systematic analysis of India’s population using district level data relating to 1951 census. The population maps published by National Atlas and Thematic Mapping Organization, Government of India (1960) revealed striking contrasts in the distribution of population with in macro and micro regions of India. Chatterjee, S.P. (1962) described the distribution and density of population of India as influenced by physiographic characteristics.

The establishment of Indian Association for the Study of Population (1972) may be considered a landmark in the history of population studies in India. The Association regularly publishes a journal entitled “Demography India”.

Recently, trends towards field work based micro level population studies at least at doctoral level research (Sharma 1991) has been observed. International Institute for population studies, Bombay, has been engaged in demographic researches in India.

A journal entitled “Population Geography” is one of the major accomplishments of the Association of population Geographers in India. This journal serves as an indicator of population studies in India.

Framework of study

The study of population is the essential part of social sciences. Poverty is the greatest problem in India particularly in Tripura, which is remote and backward state. It is observed that problems like hunger, malnutrition, unemployment etc. are directly linked with the size and growth of the country’s population.

The present investigation has been presented in the following seven chapters:

The first chapter describes Introduction which includes nature of the study, previous literature, framework of the study, major objectives, sources of data, methodology, study area, etc.
The second chapter deals with the distribution of population – rural and urban, density and concentration of population and population potential.

Population change is included in the third chapter which describes growth and variation, fertility, mortality, migration and estimation of population.

The fourth chapter deals with population composition which are linked with age-sex structure, scheduled caste and scheduled tribe concentration, workers, literacy, religious composition and occupational structure.

The fifth chapter deals with urbanization and urban growth size classes, inequality in the distribution of urban population, rank size, functional specialization and Agartala the capital city.

The sixth chapter is devoted to population and its relation with selected physical, social, cultural and infrastructural factors. Both bivariate and multivariate correlation and regression analysis have been tested.

The chapter seven is devoted to population regions, major findings and suggestions for future planning and sustainable development.

Objectives

The major objectives of this study are specifically:

i. To analyze the distributional pattern of population of Tripura, particularly to identify population density regions and to examine whether there exists any spatial pattern of distribution.
The basic reasons behind such distribution will also be identified.

ii. To study density, distributions and concentration of population in different blocks of Tripura.

iii. To examine the pattern of growth as influenced by fertility, mortality and migration, as well as spatio-temporal variations and fluctuations of population.

iv. To construct a comprehensive study of population composition both quantitative and qualitative.

v. To understand the levels of urbanization and urban growth in Tripura.

vi. To ascertain whether physical, cultural and economic factors are responsible for uneven distribution of population density.

vii. To suggest the remedial measures for the problematic regions and to formulate suitable population policy for sustainable development of the regions.

**Purpose of the study**

From the above framework the study area draws its importance for the following reasons:

i. Traditional method of agriculture and fluctuations of production of crops, deteriorated the economic conditions of the people.

ii. The state was famous for the cottage and the small scale industries in the past but due to various constraints, these industries have been declining gradually which is intimately related with socio-economic status of the people.
iii. The state’s development is retarded due to some physical, demographic and cultural constraints.

iv. The area is potentially rich in agriculture and manpower resources which are not utilized to the desired extent.

v. Different natural calamities have also seriously affected its development.

vi. The problems have been accentuated by improper location of socio-economic facilities and other amenities.

Sources of data

Population data have been collected mainly from the Census of India. Supplementary Census Report, Socio-Economic Tables, Migrations and Urban Information Tables etc. have been obtained from them. Various other statistics been collected from the Directorate of Statistics, Government of Tripura.

Other secondary data have been collected from different government offices like Directorates of Agriculture and Land Records, Industry, Settlement, Health, Education, Groundwater Board, Horticulture & Fertilizer and Indian Council of Agricultural Research, Town and Country Planning Board etc.

In some cases when Block level data have not been available, subdivisions and district level data have been used for the mapping and interpretation.
Methodology

The population data collected mainly from Census of India and the associated features obtained from different Government offices and other sources. Following quantitative techniques have been employed to analyze population:

1. Systematically arranged in frequency distributions.
2. Statistically computed various central measures like, mean, median, mode and deviations so as to ascertain the distributional pattern.
3. Concentrations of various population characteristics have been studied by standard scores, location quotients, etc.
4. The inequalities in different aspects of population have been studied by Lorenz curves.
5. Growth of population and urban population in size-class have been studied by exponential curves.
6. The rank size rule has been applied to study the population in different size-classes.
7. Population potentials have been computed by Gravity Model.
8. Pearsonian Product Moment Correlation co-efficients have been computed to measure the strength and direction of relationship between population and other variables.
9. Regression analysis has been employed to study the spatial association between population and related physical, social, cultural and infrastructural factors.
10. Composite Index has been computed to facilitate groupings.
Cartographic Techniques have also been employed to map the various aspects of population and to study their spatial patterns. These are:

11. Various point, line, area and volume symbols have been used to map the population features.
12. Graphs, bar-diagrams, histograms, pie-diagrams have been drawn to show distributions.
13. Dots and range graded circles have been employed to study the rural and urban population.
14. Isoplethic techniques have been used to study the concentration by lines of equal values.
15. Choroplethic techniques have been used extensively to show the spatial distributions and the correspondence between different correlated variables and to demarcate population regions.

**Study area**

Tripura is one of the seven states of North Eastern India adjoining Assam and Mizoram towards north-east and east. The state is surrounded by Bangladesh in North, West and South east. The study area belongs to the category of one of the smallest states of India, yet offers widest spatial disparity with regards to physical, economic and demographic conditions. It is situated between 22°56' North and 24°32' North Latitudes and 91°09' East and 92°21' East Longitudes (Fig. 1.01 and 1.02). The total geographical area of Tripura is 10,491.69 sq. km. with a total population of 27,57,205 as per 1991 Census, which has increased to 31,91,168 according 2001 Census. The state has been divided into four
districts viz. West, North, Dhalai and South Tripura. The administrative divisions are furnished in table 1.1.

Table 1.1: *Administrative divisions of Tripura, 2001 census*

<table>
<thead>
<tr>
<th>District</th>
<th>Subdivisions</th>
<th>Blocks</th>
<th>Area in sq. km.</th>
</tr>
</thead>
<tbody>
<tr>
<td>West</td>
<td>Sadar</td>
<td>Jirania</td>
<td>248.10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mandai</td>
<td>152.47</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mohanpur</td>
<td>292.63</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hezamara</td>
<td>147.03</td>
</tr>
<tr>
<td></td>
<td>Bishalgarh</td>
<td>Bishalgarh</td>
<td>364.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dukli</td>
<td>151.05</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Jampuijala</td>
<td>190.04</td>
</tr>
<tr>
<td></td>
<td>Khowai</td>
<td>Khowai</td>
<td>124.28</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tulashikhar</td>
<td>294.41</td>
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<td></td>
<td></td>
<td>Teliamura</td>
<td>349.34</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kalyanpur</td>
<td>137.94</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Padmabil</td>
<td>134.89</td>
</tr>
<tr>
<td></td>
<td>Sonamura</td>
<td>Melaghar</td>
<td>223.53</td>
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<td></td>
<td></td>
<td>Kathalia</td>
<td>147.71</td>
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<td></td>
<td></td>
<td>Boxanagar</td>
<td>110.54</td>
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<td>North</td>
<td>Dharmanagar</td>
<td>Kadamtala</td>
<td>162.04</td>
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<td></td>
<td></td>
<td>Panisagar</td>
<td>245.65</td>
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<td></td>
<td>Kanchampur</td>
<td>Pecharthal</td>
<td>150.80</td>
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<td></td>
<td></td>
<td>Daoda</td>
<td>710.67</td>
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<td></td>
<td></td>
<td>Damohhara</td>
<td>189.93</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Jampui Hills</td>
<td>169.34</td>
</tr>
<tr>
<td></td>
<td>Kailasahar</td>
<td>Kumarghat</td>
<td>247.65</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gournagar</td>
<td>247.13</td>
</tr>
<tr>
<td>South</td>
<td>Amarpur</td>
<td>Amarpur</td>
<td>487.03</td>
</tr>
<tr>
<td></td>
<td>Belonia</td>
<td>Karbook</td>
<td>156.02</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Begafa</td>
<td>511.98</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rajnagar</td>
<td>320.18</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hrishyamukh</td>
<td>166.29</td>
</tr>
<tr>
<td></td>
<td>Sabroom</td>
<td>Rupachhari</td>
<td>256.76</td>
</tr>
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<td></td>
<td></td>
<td>Satrachand</td>
<td>433.16</td>
</tr>
<tr>
<td></td>
<td>Udasipur</td>
<td>Matabari</td>
<td>325.05</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kakraban</td>
<td>116.69</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Killa</td>
<td>179.00</td>
</tr>
<tr>
<td></td>
<td>Dhalai</td>
<td>Chhaimamu</td>
<td>562.46</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Manu</td>
<td>301.76</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Salema</td>
<td>369.02</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ambassa</td>
<td>552.46</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dumburnagar</td>
<td>562.66</td>
</tr>
</tbody>
</table>

*Source: Census of India, Tripura, 2001.*
TRIPURA
ADMINISTRATIVE DIVISIONS (1991)

Headquarters:
State. District.
Sub-division. C.D./T.D.Block

Boundaries:
International. State.
District. Sub-division.
C.D./T.D. Block

Kilometers

Fig. 1.02
Table 1.2: Comparison of Administrative divisions (blocks) 1991 with 2001

<table>
<thead>
<tr>
<th>Districts</th>
<th>Subdivisions</th>
<th>1991 Area (sq. km.)</th>
<th>Blocks</th>
</tr>
</thead>
<tbody>
<tr>
<td>West</td>
<td>Khowai</td>
<td>346.45</td>
<td>Khowai, Tulashikhar, Padmabil (portion)</td>
</tr>
<tr>
<td></td>
<td>Teliamura</td>
<td>669.54</td>
<td>Rest of Khowai, Tulashikhar and Padmabil, Kalyanpur, Teliamura</td>
</tr>
<tr>
<td></td>
<td>Jiranha</td>
<td>394.12</td>
<td>Jiranha, Mandai</td>
</tr>
<tr>
<td></td>
<td>Mohanpur</td>
<td>421.62</td>
<td>Mohanpur, Hezamara</td>
</tr>
<tr>
<td></td>
<td>Bishalgarh</td>
<td>691.95</td>
<td>Bishalgarh, Dukli, Jampuijala</td>
</tr>
<tr>
<td></td>
<td>Melaghar</td>
<td>481.77</td>
<td>Boxanagar, Kathalia, Melaghar</td>
</tr>
<tr>
<td>North</td>
<td>Dharmanagar</td>
<td>1158.80</td>
<td>Pencherthal, Jampui Hills, Damchhara, Dasda</td>
</tr>
<tr>
<td></td>
<td>Panisagar</td>
<td>446.80</td>
<td>Kadamtala, Panisagar</td>
</tr>
<tr>
<td></td>
<td>Chhamanu</td>
<td>840.74</td>
<td>Manu, Chhamanu</td>
</tr>
<tr>
<td></td>
<td>Kumarghat</td>
<td>505.02</td>
<td>Kumarghat, Gournagar</td>
</tr>
<tr>
<td></td>
<td>Salema</td>
<td>604.90</td>
<td>Salema, Ambassa (northern portion)</td>
</tr>
<tr>
<td>South</td>
<td>Udaipur</td>
<td>654.79</td>
<td>Matabari, Kakraban, Killa</td>
</tr>
<tr>
<td></td>
<td>Amarpur</td>
<td>810.07</td>
<td>Amarpur, Karbook</td>
</tr>
<tr>
<td></td>
<td>Dumburnagar</td>
<td>902.14</td>
<td>Ambassa (southern portion), Dumburnagar</td>
</tr>
<tr>
<td></td>
<td>Belonia</td>
<td>538.22</td>
<td>Bagafa</td>
</tr>
<tr>
<td></td>
<td>Rajnagar</td>
<td>476.36</td>
<td>Rajnagar, Hrishyamukh</td>
</tr>
<tr>
<td></td>
<td>Sabroom</td>
<td>548.40</td>
<td>Satchand, Rupaichhari</td>
</tr>
</tbody>
</table>

| 3         | 11             | 17                  | 10491.69 38 |


The state capital Agartala is the head quarter of West Tripura district, Kailasahar is the head quarter of North Tripura district and Ambassa is the head quarter of Dhalai district, Udaipur is the head quarter of South Tripura district. These four districts are divided into 15 subdivisions and 38 blocks in 2001.
Geographical personality

The state has own personality on its physiography, geology, drainage, climate, soil, forest, landuse and land cover.

1. Physiography :

In Tripura seventy per cent of the land area is hilly (Fig. 1.03). Physiographically Tripura is divided into three distinct divisions. They are hill ranges, tillas (highlands), and lungas (lowlands) or alluvial valleys. The state is characterized by six major hill ranges with a north-south orientation separated by narrow valleys, approximately 20 km. wide. The ranges continue southward extending to Chittagang hill ranges of Bangladesh. These ranges, from east to west, are Jampui, Sakhan, Longtarai, Atharmura, Baramura and Deotamura. The highest peak is 939 metres above the mean sea level at Betlingsib on Jampui range in Tripura-Mizoram border. The height of hilly ranges varies between 249 to 939 meters with an average of 540 meters. The heights increase from south to north and also from west to east.

The highlands cover extensive areas and marks the western limit of the hilly region. These smaller hills and hillocks are locally known as ‘Tilla’. Highlands gradually rise from the west to east with elevation ranging from 15 to 75 meters and merges with the eastern hilly tracts. This physiographic division is dissected by medium and narrow valleys, streams and gulleys.

The alluvial valleys or lowlands are recognized as ‘Lunga’. The elevation of this land is less than 15 meters above the mean sea level.
These lowlands are dissected by hillocks (Tilla) and swamps or boggy surfaces. The lunga land is characterized by some concentration of population. Most of the people have been concentrated in the alluvial floodplains (Fig. 1.04).

2. Geology:

Geomorphologically Tripura is characterized by a succession of hill ranges and valleys oriented to north-south direction. The hill ranges are anticlines with relatively compact and resistant older rocks exposed in the narrow crests. The valleys are flat synclines with younger and softer rock formations exposed in wide troughs. The folded belt is the continuation of Assam-Arakan geosynclinal basin. Towards the west lies the fore deep of Bengal Basin, covered completely by Gangetic alluvium and deltaic sediments.

The region exposes mainly sediments of the Neogene age comprising succession of alternating shales, mudstones and sandstones. Extensive sediments of quaternary age occur as terraced valleys comprising mainly unconsolidated sand, silt and clays.

The succession may be divided stratigraphically from bottom upward into Surma, Tipam and Dupi tilla groups (Fig. 1.05).

The Surma group of rocks has been subdivided into a lower, the relatively more arenaceous, Bhuban unit and an upper mainly argillaceous, Boka Bil units. The Bhuban formation exposed in the cores of anticlines consists of sandstone, shale and limestone. The Boka Bill
TRIPURA
GEOLOGY

INDEX

QUATERNARY FORMATION
(Pleistocene-Recent)
DUPTITA GROUP
(Pliocene)
TIPAM GROUP
(Pliocene)
BOKABIL
FORMATION
Miocene
Surma
Group
BHUBAN
FORMATION
Miocene
F - F
FAULTS / THRUSTS

Fig. 1.05
formation predominantly consists of siltstone with interbedded sandstone.

The Tipam groups consists of sandstone with occasional their bands of siltstones and boulders of calcareous concretion and coal streaks.

The sediments in the synclinal troughs in the West Tripura are at places unconformably overlain by a sequence of unconsolidated to semi-unconsolidated sediments arranged in terraces which is named as Dupi Tilla group. The Pleistocene sediments in West Tripura occur in the form of river terraces and valley sections having maximum areal coverage. The Pleistocene sediments of the area subdivided into four formations which are found in the eastern margin of the Bengal basin. The lower terrace occurs at low mounds usually 6-8 meters below the upper terrace. The paired terraces are less extensive and occur along the present day major rivers. The fourth unit is the youngest, still forming. It occurs in the flood plains and neoflood deposits of bars and fills.

Tectonically, the region comprises a series of sub-parallel, elongated plunging folds arranged in a north-south direction with slight convexity to the west. They are folded into narrow anticlines separated by wide flat synclines. The steeper flanks of the asymmetrical anticlines commonly form monoclinal steps and these are often dislocated and upthrown against the dipping flanks of the adjoining synclines by longitudinal reverse faults.
The most important mineral potential in Tripura is oil and natural gas. Apart from this there are glass, sand, limestone and clay deposits suitable for commercial explorations. The hard rocks may be used for constructional purposes.

3. Drainage:

Drainage plays a significant role in the distribution of population. The state is well watered by rivers. There are nine major rivers draining the state. These are Juri-Langai, Manu-Deo, Dhalai, Khowai, Haora, Burigang, Gumti, Muhuri and Fenny. The main river originates from the hill ranges running through the state and flow through the valleys, lying between the principal hill ranges. The rivers are fed by numerous tributaries arising from the catchment areas. The drainage pattern is typically trellis. Dendritic pattern is also observed in a few places. A significant feature of the river is that they are ephemeral in nature and their flows are directly related to rainfall (Fig. 1.06).

<table>
<thead>
<tr>
<th>Table 1.3 : Drainage basins</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name of basin</td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td>Juri-Langai</td>
</tr>
<tr>
<td>Manu-Deo</td>
</tr>
<tr>
<td>Dhalai</td>
</tr>
<tr>
<td>Khowai</td>
</tr>
<tr>
<td>Haora</td>
</tr>
<tr>
<td>Burigang</td>
</tr>
<tr>
<td>Gumti</td>
</tr>
<tr>
<td>Muhuri</td>
</tr>
<tr>
<td>Fenny</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

*Source: Department of Irrigation, Govt. of Tripura*
The Gumti is the biggest basin with 23.83% of the total geographical area and Fenny (5.56%) is the smallest of all the river basins. The beds of the rivers are generally sandy and the banks are cultivated as near to the water's edge as possible. The character and pattern of drainage system has got special relevance in population distribution and land use. Rivers play an important part in the socio-economic well being of the people. Rivers become torrential in nature during rainy season and causes flood. On the contrary these rivers bring fertile soil to the plain areas which helps to enhance the food production.

4. Climate:

This is an important factor for determining the spatial distribution of population. The climate of the state is tropical in nature and is generally warm and humid. In comparison with plain lands, the hilly tracts enjoys lower temperatures in both summer and winter. Three distinct seasons are recognized i.e. summer, rainy and winter.

Temperature: The maximum temperature ranges between 31.00°C to 33.40°C and minimum temperature varies between 15.00°C to 16.75°C. The table 1.4 shows the average maximum and minimum temperatures and annual rainfall of some selected stations of Tripura.

The maximum and minimum temperatures of Tripura are plotted in the map and then isothermal lines have been drawn at suitable intervals. Various regions are shaded in different symbols from high to low (Fig. 1.07 and 1.08). The maps show that highest temperatures are
TRIPURA
MAXIMUM ANNUAL TEMPERATURE
( Summer )

INDEX
( in degree celcius )

> 33.00
32.50 - 33.00
32.00 - 32.50
31.50 - 32.00
< 31.50

Fig. 1.07
TRIPURA
MINIMUM ANNUAL TEMPERATURE (WINTER)

INDEX
( in degree celsius )

- > 16.00
- 15.50 - 16.00
- 15.00 - 15.50
- < 15.00

Fig. 1.08
recorded in Agartala in the West and Kamalpur, Kailasahar, Dharmanagar in the North and Belonia in the South. Maximum temperature decreases from west to east. The minimum temperature decreases from Sabroom in South and Agartala in south-west to Khowai and Teliamura in North. Again minimum temperature decreases from Dharmanagar and Kailasahar in the North to Kumarghat in the north-west.

Table 1.4: Temperature and annual rainfall

<table>
<thead>
<tr>
<th>Stations</th>
<th>Mean temperature in °C</th>
<th>Annual rainfall (mm.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Maximum</td>
<td>Minimum</td>
</tr>
<tr>
<td>1. Agartala</td>
<td>33.30</td>
<td>16.50</td>
</tr>
<tr>
<td>2. Khowai</td>
<td>32.01</td>
<td>15.20</td>
</tr>
<tr>
<td>3. Teliamura</td>
<td>32.00</td>
<td>15.00</td>
</tr>
<tr>
<td>4. Sonamura</td>
<td>31.05</td>
<td>15.07</td>
</tr>
<tr>
<td>5. Dharmanagar</td>
<td>33.30</td>
<td>16.50</td>
</tr>
<tr>
<td>6. Kamalpur</td>
<td>N.A</td>
<td>N.A</td>
</tr>
<tr>
<td>7. Kumarghat</td>
<td>32.00</td>
<td>16.00</td>
</tr>
<tr>
<td>8. Udaipur</td>
<td>32.03</td>
<td>16.75</td>
</tr>
<tr>
<td>9. Belonia</td>
<td>33.40</td>
<td>16.10</td>
</tr>
<tr>
<td>10. Sabroom</td>
<td>31.00</td>
<td>16.50</td>
</tr>
<tr>
<td>11. Kailasahar</td>
<td>33.30</td>
<td>16.50</td>
</tr>
</tbody>
</table>

Source: Meteorological Office, Agartala Airport, 1999

Rainfall: The highest annual rainfall (2640.05) was recorded at Dharmanagar. The northern part of Tripura enjoys maximum rainfall due to the presence of high hill ranges. Some cyclonic rainfall occur at the late summer and early retreating monsoon season in Tripura. Rainfall gradually decreases in the western part of Tripura (Fig. 1.09). In fact, good climate is a precondition of human life. Extreme cold climate of North Tripura does not favour the human habitations. But in the plain region the moderate climate ensures a higher distribution of population.
Fig. 1.09

TRIPURA
ANNUAL RAINFALL (1998)

INDEX
Rainfall in mm

- > 2500
- 2375 - 2500
- 2250 - 2375
- 2125 - 2250
- 2000 - 2125
- < 2000
A soothing climatic condition influences the human health and mental energy of the people.

5. Soil:

In Tripura the amount of annual rainfall being fairly high the soils and bed rocks are subject to severe chemical weathering and rapid erosion. The humid tropical monsoon climate of Tripura has given rise to five broad groups of soils (Fig. 1.10) viz. (i) Reddish yellow brown sandy soils, (ii) Red loam and sandy loam soils, (iii) Older alluvial soils, (iv) Younger alluvial soils and (v) Laterite soils.

The occurrence of the different kinds of soils, largely depends on the topographic situation, land slope, parent rock material, climatic regime and the type of vegetal cover. The table 1.5 shows area and percentage of different soil types in Tripura.

<table>
<thead>
<tr>
<th>Soil group</th>
<th>Area</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Km.</td>
</tr>
<tr>
<td>1. Reddish yellow brown sandy soils</td>
<td>3,468</td>
</tr>
<tr>
<td>2. Red loam and sandy loam soils</td>
<td>4,514</td>
</tr>
<tr>
<td>3. Older alluvial soils</td>
<td>1,019</td>
</tr>
<tr>
<td>4. Younger alluvial soils</td>
<td>980</td>
</tr>
<tr>
<td>5. Laterite soils</td>
<td>511</td>
</tr>
<tr>
<td>Total</td>
<td>10,492</td>
</tr>
</tbody>
</table>

*Source: ICAR (Tripura) 1991*

i. Reddish yellow brown sandy soils

This group is found extensively occurring on the north to south trending till ranges of Tripura which are covered by lush evergreen
TRIPURA
SOILS

INDEX
- Reddish yellow brown sandy soil
- Red loam & sandy loam soil
- Older alluvial soil
- Younger alluvial soil
- Laterite soil

Fig. 1.10
tropical forests. One-third area (33.05%) is covered by this type of soil. The reddish yellow brown sandy soils being associated with the ridge tops and sloping flanks of the hill ranges, are highly susceptible to erosion. Agriculturally this soil is not suitable for good yielding. So human habitation does not thrive on this soil.

ii. Red loam and sandy loam soils

The red loam and sandy loam soils are the most extensive formations, covering some 43% of the total geographical area of Tripura. These soils are associated with the numerous valleys and the forest covered undulating uplands of the state. Plantation crops like rubber, tea and pineapples are intensively cultivated in this soil. These areas are moderately populated.

iii. Older alluvial soils

This soil is of recent origin. Being situated on the river terraces and high plains of Tripura, this soil zone extends for nearly 10% of the state’s geographical area. This soil is fairly rich in nutrient status and is suitable for arable farming. So this soil group bears some pressure of population. The river terraces, uplands and slopes are subjected to severe gully erosion. So adequate measures of soil conservation are followed in the older alluvial soil zone.

iv. Younger alluvial soils

These are mainly confined to the flood-plains of the streams like the Khowai, Haora, Gumti and Muhuri and covers only 9% of the total area in Tripura. The younger alluvial soils usually occur along the rivers
near the periphery of the state as the rivers debouch on to the lower plains of Bangladesh. These soils are affected by floods almost every year and are enriched by deposition of new layers of silt and clay as the flood recede. The soils are, therefore, extremely rich in nutrients. Paddy cultivations are practiced in this zone. Most of the urban centers have grown up in this particular area.

v. Laterite soils

This covers only 5% of the total geographical area. It is derived soil group and poor in soil nutrients. This soil consists of grasses, scrubs and bushes. It is not suitable for agriculture.

6. Forest:

Forest, being a very important natural resource, constitutes a vital component of population in Tripura. Forests have a significant role in maintaining the productivity of land on which our agriculture depends to a large and significant extent. Forests act as the natural determinant to soil erosion and landslides. Forests maintain ecological balance. As a natural resource it provides timber and fuels and constitutes a vital component of the state’s economy. The areal extent of the forest of Tripura state is 6271.5 sq. km. i.e., about 59.77% of the total area.

Based on climate and altitude the six broad categories of forests have been recognized (Fig. 1.11).

i. Northern tropical semi evergreen forest

ii. Moist mixed deciduous forest
Northern tropical semi evergreen forest

This forest zone occurs in the eastern and to some extent in the south-western and central parts of the state. The covering areas are Panisagar, Kanchanpur, parts of Kumarghat, Teliamura, Melaghar, Bagafa and Satchand blocks. The forests now exist only in patches in the steep hill slopes and rocky surfaces. Garjan, Bamboo are the main species. It is partly used by the people of Tripura.

Moist mixed deciduous forest

There are two varieties of moist deciduous forests found in Tripura such as mixed deciduous forest and moist mixed deciduous forest. These are generally found to occur intensively in State. This forest zone extends in north-south trending appearance. The main species are Kanak, Bohera, Poma. Korai, Awal, Harguza and Muli bamboo. This is the best habitation zone for the people of Tripura.

Northern moist deciduous forest

This forest zone occurs in scattered areas of Kanchanpur, Teliamura, Amarpur and Satchand block of Tripura. These forests occur along the slopes of main hill ranges and are very open due to intensive jhuming Awal, Udal, Gamar, Harguja, Kumira are the main trees in this zone. The bamboo growth is of medium quality due to jhuming. Many tribal people live in this zone.
Fig. 1.11
iv. Very moist sal bearing forest

This forest zone is found in small patches of Melaghar block and lowlying areas of the state. Sal is found mixed with Garjan. Bamboos are absent. The main species are Sal, Kanak, Harguja, Bahera, Awal, Gamar and Kajikara. This zone is moderately suitable for population.

iv. Swamp vegetation

Swamps locally occupy a very large area all over the state. Most of the lunga land is dominated by this type of vegetation. Water hyacinth are the common species in this area. This vegetative zone is unsuitable for the inhabitants. But at present due to pressure of population the swampy lands are filled up and have been suitable for human habitations. Swamp vegetation covers the areas of Bishalgarh, Matabari, Jirania, Malaghar Blocks.

v. Grass land vegetation

A large part of the state is blanketed with vast expanse of grasses which maintain the condition of equilibrium by biotic influence. Normally this land has been treated as fallow land. It is partly used for the people of Tripura.

But natural forests have some economic value. In rural areas some people mainly depends on natural vegetation, especially the tribal people of Tripura. Hamleted and dispersed type of settlement distributions are the typical feature in this area.
7. **Landuse and land cover**:

Economy of Tripura being typically agrarian with 83% of population living in rural areas. There is a tremendous pressure on rather limited cultivable area. Culturable waste land are also utilized to some extent because a long spell of unuse may ultimately lead to the permanent degradation of these lands. The culturable waste lands now-a-days have been brought under rubber plantations.

From the landsat imagery the state has been classified into six land cover categories, viz. (i) degraded land, (ii) forest cover, (iii) waterbodies, (iv) settled land, (v) crop land, (vi) plantation area (Fig. 1.12). Land is one of the greatest resource of a region. Its proper use provides score for human dwellings, communication lines, factories, cultivation, grazing, orchards and forests, etc. It is, therefore, important to know the various uses to which land is put in Tripura at present and to know its potential uses.

(i) Degraded lands are maximum in comparison to other land cover. These lands are seriously affected by soil erosion and mass waste. For this reason these lands are not suitable for human living.

(ii) Forest cover lands are occupied in continuous banded form. These are found along the hill ranges of Tripura. The loss of forest cover is obviously due to human interference. Degradation of forest is also affected by jhum cultivation by the tribal jhumias.
Fig. 1.12
(iii) Waterbodies are not so prominent. In Matabari, Melagarh, Panisagar block and Agartala town are characterized by major waterbodies. Settled areas are usually formed in and around waterbodies.

(iv) Settled areas are concentrated at the urban centers of Tripura. Agartala is the densely settled area due to availability of different amenities and infrastructural facilities.

(v) Crops lands are mainly found along the river banks. These areas are formed of fertile soil in the plain lands. Settled areas are surrounded by crops land.

(vi) Plantation crops have been introduced recently in Tripura. Some tillas have been cleared for the rubber and tea plantations. Degraded lands are used for pineapple plantations.

The paucity of crop land and terrorist constraints emphasized the need for adopting scientific land use planning for maximization of benefits of lands without disturbing the ecological balance. There is no crop land in Kanchanpur and Chhamanu blocks. Rural population are closely dependent on definite landuse pattern. Rural people build their houses near the waterbodies and crop land because they protect their cropped land. Tribal people lives in the forests and practice jhuming.

Problem

Regional disparities in population distribution in the state are reflected by the variation of physical, economical and cultural factors. Any change in the existing situation involves a change in the pattern of population distribution. Favourable environment and better economic
opportunities generally give rise to greater population clusters and therefore higher population densities.

Other population components like sex-ratio, age composition, occupational structure, literacy levels, religions composition and marital status etc. evolve deeper understanding of population dynamics of the region. The term analysis refers to the computation of certain measures along with searching of patterns of relationship that exists among various groups. Tripura is a land of inaccessible hill ranges which obstruct the detailed-field survey. Moreover, due to frequent change of administrative divisions particularly in the block levels without proper boundary delineation, the changing pattern of population can not be studied systematically.