CHAPTER I  
INTRODUCTION

1.1 INTRODUCTION

In the subject of geography various branches are studied since ancient time, few of them are newly introduced in the subject matter of geography. Population geography is one of them. Population geography is recently emerged as a separate discipline of study and research. It is concerned with the spatio-temporal analysis of population. It involves not only the magnitude of human population but also its different characteristics, growth and mobility (Ghosh, 1985); scope of this branch is too vast thus, today it is treated as an independent specialised branch. Geography is the study of distribution of physical and cultural factors over the surface of the earth. Population itself is an important cultural aspect, which varies over the surface of the earth. Distribution of population, its growth, its religious and linguistic composition, sex ratio and age composition, migration, standard of living, its economic and occupational structure etc. are some of the indicators, which are studied in population geography, and all of them directly or indirectly put an impact on the human development. Adaptation of various human groups to their respective environments in different parts of the world, and also other various aspects of population have been studied since long in this branch.

In the regional geography, the study of population and its indicators is noteworthy. In fact, it is the part and parcel of any regional geographical studies, because population is the great resource among all the resources. The disparity in spatial development in economy of the region is the combined result of natural environment, its resources and the existing demographic structure and spatial pattern of population in the region. An analysis of various aspects of population i.e. growth, distribution, density, sex ratio, literacy, occupational structure and urbanisation etc. provides a clear understanding of the problems in the region which must be taken for rational regional and intra-regional planning.
Within the past two decades, vast changes have occurred in many aspects of life in every country of the world. Perhaps the most significant has been the recognition, that rapid rate of population growth influences every sector of economic and social development. Worldwide interest in the population problems evolving from rapid population growth has been promoted by two major considerations, an increasing concern about the relation between population growth and available resources and a growing awareness that unrestricted population growth tends to impose a strong constraint on the standard of living, happiness and even survival of mankind through the spiralling consumption of the fixed quantity of resources (Bhattacharjee and Shastri, 1976).

India, which is the second most populous country in the world after Mainland China, crossed the billion marks in 2001. India has a great diversity from region to region in geographical, social and economic conditions. The impact of these socio-economic differences on the process of population growth remains concealed when trends at the nation level alone are considered. Therefore, it is important to study the variations in the trends in population characteristics at the regional level (Agarwala, 1973).

Along with the population structure and distribution pattern, the fertility, mortality and migration these are the tubers of population studies. In this concern this study trying to put focus on the spatio-temporal changes in population, consequences of changes in population are the main reasons behind it and also strive to use this study to the scheme of development and planning.

1.2 IMPORTANCE OF POPULATION GEOGRAPHY

It is argued that the nature of contemporary population geography owes more to the radical changes in approach and methods operating throughout human geography in 1960s and 1970s than to the particular emergence and development in the 1950s of population geography as a recognized branch of geography; yet these early roots must at least be acknowledged and traced briefly.
In authoritative reviews of the evolution and nature of geography, Hartshorne (1939) and Wooldridge and East (1951) made not a single reference to population geography, thus indicating the late entry of population geography into the recognized branches of the subject (Sawant and Athavale, 1994).

It was in the early 1950s that population geography emerged as a systematic branch of geography. Much of the credit goes to Trewartha, who used the platform of his presidential address to the Association of American Geographers in 1953 to make a powerful case for, and an outline of population geography. He argued that population was the pivotal element in geography, and the one around which all the others are oriented, and the one from which they all derive their meaning (Trewartha, 1996).

Spatial distribution and areal differentiation of population attributes were clearly the unifying threads within population geography at this time. Thus, Trewartha (1953) saw its purpose as ‘an understanding of regional differences in the Earths covering of peoples’ while Bhende, A. A. and Kanitkar, T. (1998) thought ‘the objective of population geography is to define and to bring forth the significance of differences from place to place in the number and kind of human inhabitants’. The role of the population geographer was regarded by Zelinsky Wilbur (1966) as ‘studying the spatial aspects of population in the context of the aggregate nature of places’ and by Beaujeu Garnier (1966) as describing ‘the demographic facts in their present environmental context’. More explicitly, Clarke John I. (1965) stated that ‘population geography is concerned with demonstrating how spatial variations in the distribution, composition, migration and growth of population are related to spatial variations in the nature of places’.

In short, geography is defined as the study of ‘man environment relationship’, where man plays a pivotal role in molding the physical landscape to develop his own cultural milieu. This man-land interaction is expressed in the form of population distribution, economic activities, settlement patterns, political organizations and cultural traits as they are influenced by various physical, cultural, social and demographic factors. Therefore, geographers as
scientists are primarily involved in the study of spatial expression of the intricate man-nature relationship (Munsi, 1988). The present work addresses issues related to population studies in the context of Pune administrative division in Maharashtra. Such studies have been the subject of concern for various social scientists including Geographers. The varying contents and methodologies of different disciplines studying population, notwithstanding, each science has made valuable contribution towards the understanding of spatio-temporal patterns of population (Woods, 1979).

Anthropological studies concern human population in their social and cultural context. A sociologist is more concerned with the studies related to social groups in their institutional and organizational set up (Reiss, 1968); whereas investigation by the demographer is the quantitative study of human population (Krik, 1968). The statistician mainly deals with statistics of births, deaths, migration, marriages ignoring spatial variation and its effects. Thus, Geography, which includes a formal study of population, occupies an important place among many disciplines. The field of investigation of geographers ranges from the global spatial relationship to micro-regional interaction within territories and nations. They study the process of integration, differentiation, and fragmentation, within the context of the global scenario around us. Thus, emphasis upon spatial distribution and subsequent questions of spatial interactions makes population geography unique among the various social sciences (Demko, 1970).

Population geography lays emphasis on the ‘spatial dimensions’ in the distribution, structure, composition, migration, growth and other demographic facts. It seeks to find a pattern and an order in the spatial distribution of demographic elements (Srivastava, 1998).

Population study is the part and parcel of any regional geographical study, because population is the great source among all the sources. The disparity in spatial development in economy of the region is the combined result of natural environment, its resources and the existing demographic structure and spatial pattern of population in the region. An analysis of various
aspects of population, *i.e.* growth, distribution, density, sex ratio, literacy, occupational structure, urbanization, etc. provides a clear understanding of the problems in the region which must be taken for rational regional and intra-regional planning.

Fertility, mortality and migration are at the root of any studies of population along with structure and distribution pattern. In this concern, we study spatio-temporal distribution and changes in population, the reasons behind it and the consequences of the changes. In population structure, we study age, sex, literacy, and economic and occupational structure. While studying population structure, we classify population with the above characteristics.

Distribution pattern of population is also an important aspect of geographical study. The distribution of population is more locational, it refers to the spatial pattern in which the population finds its location such as linear, dispersed, nucleated, agglomerated etc. In this concern, percentage of people living in the geographic areas has been calculated. Similar to the distribution of any other natural resource, the distribution of population on the surface of the Earth is uneven. Causes for this disparity vary with the time and space. It will not be proper to say that natural factors only influence distribution of population. Population increases rapidly in the areas where there is scope for economic development and several factors favour human settlement. In the areas where conditions are favourable for the development of agriculture, industry, transportation and trade, the carrying capacity of land is high. Such areas can accommodate more people. Conditions suitable for human health play an important role in influencing distribution of population.

In India, first census was conducted in 1872, but no attention was given to the population problem. The first conference on population in India was organized at Lucknow University in 1936. Since then, the universities and institutes undertook several studies and research works. International Institute of Population Studies was established at Mumbai. In recent time, various
geographers have written books on relationship between geographical background and population of India.

Population geography in India commenced in real earnest in the early sixties. It has made commendable progress in the last forty years, or so and finds a place as a specialized course in the geography curriculum of several universities (Krishan, 1997). The voluminous data contained in the Indian Census encouraged geographers to take up geographic analysis of population for almost every part of the country, both at micro and macro level. Recently, a trend towards micro level studies based on fieldwork has received greater attention at least at the research level and has been growing progressively. Perceptible changes are visible in the research focus as population geographers can be segregated in India are gradually shifting from macro to micro level studies. The contents of population geography can be segregated in to core and peripheral issues. Those at the core are largely concerned with the distribution and structure of population with fertility, mortality, and migrations, and what leads to such variation and how they affect the social, cultural, economic, political and environmental issues. At the periphery, lie issues that are central to other specializations, such urbanization, social segregation etc. The Indian geographic scene with its entire complexities offer a rich laboratory for Indian population geographers for the development of theories and models suited to Indian situations. Models and theories developed in the spatio-cultural-political-historical context of India shall have wider utility and applicability to other developing countries (Chandna, 1994).

Thus, this research is an attempt to analyze some of the issues discussed above. Current trends indicate that micro level studies are picking up not only at a snail’s pace but also are the theoretical formulation by Indian population geographers (ibid, 1994). Population geography needs to be rescued from the narrow confines of traditional demography and there has to be a search for a meaningful understanding of social dynamics. At the same time, geographers need to grasp the meaning of the science and technology revolution that is sweeping throughout the present day world and take cognizance of the impact
of these changes while firmly basing ourselves on the fundamental tenets of our
discipline (Munsi, 1996).

1.3 OBJECTIVES OF THE STUDY

Maharashtra is a leading state in India in every context and the study region i.e. Pune Division is a comparatively well developed area and has very rich background of social, cultural, economic, educational, agricultural, industrial factors. It also influences various elements of population. The general objective of the present study is to assess the various characteristics of population structure and distribution pattern in Pune Administrative Division of Maharashtra and to compare its population statistics with those of the state of Maharashtra and India to appreciate the comparative status of the population characteristics of the study region, from a geographer’s viewpoint.

Particular objectives of the present study are listed below.

1. To present geographical profile of the study area and to correlate the factors to the distribution of population.
2. To analyse the patterns of growth of population in the study area and to present the changes in the population growth along with crude birth rates and crude death rates.
3. To study the sex ratio and the changing trends in the sex ratio of population in the study area.
4. To study the literacy patterns and changes in it in the study area.
5. To present the growth of urbanisation and to present the trends in the growth of urbanisation in the study area.
6. To study the occupational structure of the population in the study area and to present the changing trends in it.
7. To find out the major problems related to the various aspects of population in the study area and to do necessary recommendations.

In short, to present the entire geographical perspectives of the population structure of the study area i.e. Pune Administrative Division during a period
of 100 years; from 1901 to 2001 in general and during the period of 30 years (1971 to 2001) in particular.

The role of a geographer is very vital in synthesizing the findings of other branches of knowledge and in presenting a complete picture of the region, which may then pass on in the hands of the planner for retouching (Ackerman, 1959). Therefore, an attempt has been made to synthesize a few facts relating to the population of the Pune Division and it is hoped that the findings will be of use to those who are engaged in developmental planning of the region. Thus, the study aims at better management of human resources in the context of physical resource setting.

1.4 CHOICE OF THE STUDY REGION

As defined by Jackie Smith region is a unit of land that is considered to have unique character or homogeneity based on local features of geology, relief, soil, climate, vegetation and human way of life. Region is thus a geographically well defined area.

As early as 1812 A. L. Bucher expressed his ideas regarding region as the geographical area in their physical character have more similarities with each other than with the next nearest areas.

According to Peter Hagget (1983) a region is any tract of the earth’s surface with characteristics, either natural or human origin, which make it different from the areas around it.

Phani Deka and Abni Bhagvet (1992) have described the geographical region as a space having dimensions of length and width and also well demarcate by natural or manmade boundaries along with homogeneity in one or more criteria.

The study region selected for the present research is Pune administrative division of Maharashtra State. The division includes five districts viz. Pune, Satara, Sangli, Kolhapur and Solapur divided into 58 tahsils.

The division or study area is a located in the south central part of Maharashtra and is a part of Deccan plateau, it is commonly known as ‘Desh’. 
which is a regional name. Sahyadri range is dividing between Kokan to the west and Desh to the east.

Geomorphically, Pune Division is a part of Deccan, characterised by Deccan Trap topography. Geologically, it has a common history of formation. Pedologically, it has a soil structure with common characteristics. The drainage system in the area has also many common characteristics. Thus, the area encompassed in the division has almost all the features of a geographical region. Hence, it can be treated as the geographical unit or a region and is referred as the study region.

Always as common question is asked about the term ‘Region’ and ‘Study Region’ used in the research work. A preferred term is ‘Study Area’. However, in Maharashtra the most of the administrative divisions coincide with the geographical regions like Kokan, Desh, Varhad, Khandesh, Zadi, Marathwada, etc. In the case of study area selected for the present research work coincides to a greater extent with the geographical region i.e. major part of the region ‘Desh’. Hence, the term study region has been rightly used along with the term study area.

C. D. Deshpande (1971) has divided the study region into various sub-regions, which include Mahadeo range, upper Bhima basin, Pune metropolitan region, lower Bhima and Nira basins, upper Krishna basin, Panchganga-Krishna basin, southern valleys and Solapur city. According to him within the larger Maharashtra plateau the west central uplands can be recognised as its major regional entity on the basis of landforms, economic development, orientation and space relations.

The study region i.e. Pune administrative division of Maharashtra extends between 15° 45’ North to 19° 24’ North latitudes and 73° 19’ East to 76° 15’ East longitudes. The region has an area of 57,235 sq km and total population according to 2001 census, is 1,99,73,761 among them 1,02,83,976 are males and 96,89,785 females according to the 2001 census. The density of population is 349 persons per sq km. The region is surrounded by the Karnataka State in the south, Kokan region in the west, Nashik in the north and
the eastern boundary is surrounded by Aurangabad administrative region of Maharashtra.

Physiography of the region is uneven in nature. Higher elevations are in the western part *i.e.* Western Ghat or Sahyadris. The average height of the range is 1300 meters. The highest peak of the region is Kalsubai elevates 1646 meters, Harishcandra-Balaghat and Shambhu-Mahadev these are the sub ranges of Sahyadri, which extends in North-West and Southeast direction in the study region.

The major river systems are Bhima and Krishna. These rivers with their tributaries flow in Southeast direction throughout the region. Sina, Nira, Ghod, Kukdi, Indrayani, Mula, Mutha are the major tributaries of Bhima and Koyna, Yerala, Panchganga are the major tributaries of River Krishna.

As mentioned earlier the study region comprises of five districts *i.e.* Pune, Satara, Sangli, Solapur and Kolhapur. There are total 58 tahsils in the study region, of these, Pune district is having 14 tahsils, Satara 11 tahsils, Sangli 10, Solapur 11 and Kolhapur district is having 12 tahsils. As similar to the country and the state Pune Division, also experiences the changing trends in structure and distribution pattern of population because physical, political, economic, social and technological factors influence the population structure and pattern.

Though the study region selected for the present research is in general, homogeneous in many geographical aspects, there are many underlying diversities as far as population factor is considered. Growth and distribution of population, sex ratio, literacy, patterns of urbanisation, occupational structure and many other aspects show diversity, the topic of actual research is to throw light on these diversities. This is why the particular region was selected for the study.

Ichalkaranji and Solapur are old industrial centres in the study region. As a result of development of agro-based industries, especially sugar and allied industries in river basins right from Baramati in the north to Ajara in the south new employment opportunities are available. Industrialisation and urbanisation
along with development of infrastructural facilities and educational facilities
the population structure in the major part of the study region has been changing
rapidly. Again, the study region due to the geographical aspects can be treated
as the representative division of the state in general and Maharashtra plateau in
particular. Thus, the study can be of a representative type. All these
considerations motivated the researcher to turn his attention to this region and
thus the region was selected for the study of population aspects.

Pune administrative division shares 18.60 per cent of the total area of
Maharashtra state and 20.64 per cent of population. Out of the total 58 tahsils
in the division 38 per cent \(i.e.\) 22 tahsils are located in the western hilly region,
which have very rough terrain and experiences heavy rainfall. Another 31 per
cent \(i.e.\) 18 tahsils are located in the drought prone area with scanty rainfall and
scarcity of water. Remaining 31 per cent \(i.e.\) 18 tahsils are located in the central
north-south belt where there are favourable factors like fertile soils, moderate
rainfall, river basins, developed agriculture due to irrigation facilities, good
transportation network and well developed industrial centres. The study region
horizontally can be divided into two river basins. Bhima basin in the north with
62 per cent of the total \(i.e.\) 36 tahsils and Krishna basin in the south having 38
per cent \(i.e.\) 22 tahsils.

1.5 THE PROBLEM

The problem selected for the present research work is to analyse various
aspects of population structure including distribution, density, growth, sex
ratio, literacy, urbanisation and occupational structure; in the study area
\(i.e.\) Pune Administrative Division in Maharashtra state and to study the
spatio-temporal variations in the population characteristics over a period of
hundred years (1901 to 2001) at the district level and over a period of three
decades (1971 to 2001) at the tahsil level; from the geographer’s view point. It
also includes the necessary comparison with the state and national census data.
1.6 NATURE OF THE RESEARCH WORK

The study of human populations embraces a wide academic spectrum, and it is important to review the interests of at least some of the more central and an important discipline in the field of population in order to assess how distinctive is the approach of population geography. As response to the stress imposed on societies and their habitats throughout the world by unprecedented increase in human numbers and appetites in this century, there has been ever-growing interest by academics, general public and governments in ‘the population question’ at all levels of scale from global to local. Major international organizations like United Nations, World Bank and Population Council have concerned themselves more and more with the study of global population problems, especially with a view to incorporate appropriate population policies in overall development strategies in the world.

The present study belongs to the field of population geography. Population geography inspite of its immense significance remained neglected for a long time. Of all the geographic phenomena, population in terms of its various attributes is the most representative of the total personality of any area. It is pivotal and dynamic element in areal differentiation, which is the central theme of the science of geography. It is true that the study of population does not belong exclusively to the population geography, but to diverse disciplines of knowledge, like Demography, Sociology, Anthropology, Psychology, Economics, History, Political Science, Statistics, Women Studies as well as Geography. The scholars of these disciplines have been contributing to analysis of population. A geographer studies population not as a phenomenon itself but as an already varying and area-characterizing element. The emphasis of geographer is particularly on an areal differentiation, and this is the most dynamic feature of geography, which sets it apart from other subjects (Jones, 1981). It was this consideration, which stimulated the researcher to work in this branch of geography.

The region under study lies in southern Maharashtra. Its geographic location is typical i.e. occupying region on the border of Maharashtra and
Karnataka and sprawling on hilly, uneven, semi humid as well as dry part of the state. This has given the peculiar characteristic to the population structure of the region. Therefore, it is necessary to bring out the salient features of the population through geographic analysis. It is believed that a distinct demographic profile, emerging from the present research, will help to formulate a population policy for the region in particular and be relevant in the context of India as a whole.

The problem being tackled in this piece of research work is to analyse the various elements of population in this region. Some specific aspects emerge due to the physiography of the region and the region’s location along the state border. There is a spatio-temporal variation in the population characteristics due to physiography, climate, infrastructure and socio-economic development. With this assumption, the present geographic enquiry has been undertaken.

The nature of the research work embodied in the thesis is analytical and descriptive. It is spatio-temporal analysis of the population structure of Pune division in Maharashtra state of India, a geographical perspective. Population is the subject of study among many disciplines such as Economics, Sociology, Demography, Planning, Anthropology and mainly Geography. Our interest in the topic being geographers is mainly from the geographical viewpoint.

The study is both analytical as well as descriptive. In a descriptive study there may be one or more variables. The aspects of structure of population selected for the study include distribution, density, growth, sex ratio, literacy, occupational structure and urbanisation. All these aspects have the impact of geographical factors to a greater extent along with many other factors such as economic, political, social and cultural. Government policy is also an important factor. Again there is a co-relation between various aspects of population structure and the influencing factors.

The study is analytical in nature as it is an analysis of the population structure, both spatial and temporal. Spatial pertaining to space i.e. the area of the present study, which is Pune Division in Maharashtra state. The study area is an administrative division or unit. At the same time, it has the characteristics
of a geographical region mainly central-southern part of Desh region or the South Deccan or the southern Maharashtra plateau region embodying Bhima and Upper Krishna basins. As stated earlier, it includes five districts and 58 tahsils; for which the data related to the selected aspects has been collected. The data obtained from census records has been processed, tabulated and maps, diagrams and charts have been created. These are analysed, and inferences are drawn.

The co-relation between various aspects, the spatio-temporal changes, the factors responsible for the changes and trends have been described. Generally, the descriptive studies in their simplest form describe the characteristics or variables one at a time. However, we have for greater precision and concreteness considered two or more aspects at a time, but in general one aspect at a time is the basic form.

### 1.7 CONCEPTS AND DEFINITIONS

Some definitions and terms are used in the thesis regarding to the population geography and population indicators, which are stated below.

1. **Population Density**: The density is defined as the population per sq km. It means Population density of particular region is the ratio of total population and total area of particular region.

2. **Population Growth**: The growth of population means any change in population number, further it refers to the growth of the human population in a particular area during a specific period of time, if this change is in negative direction then population decreases and if it is in positive direction then the population increases. This truly designates that population growth does not necessarily always indicate an increase. The growth of population is resultant feature of the natural increase and the net immigration over a certain period of time in a particular region.

3. **Crude Birth Rate (CBR)**: Crude Birth Rate is the number of births in a year per 1000 of the mid-year population. It is obtained by dividing the
number of births recorded in a region during a year by its mid-year population. If we multiply this by 1000, we get the birth rate per 1000 population.

4. **Crude Death Rate (CDR)**: Crude Death Rate is a ratio between number of deaths in a particular year in a region and mid-year population of the region. When this ratio is multiplied by 1000, we get Crude Death Rate for the region. Crude Death Rate means average number of deaths per thousand population.

5. **Sex Ratio**: The Indian censuses define sex ratio as the number of females per 1000 males. Sex composition constitutes one of the most readily observable elements of population. It is an important aspect of population composition that sets the future rates of fertility, mortality and migration.

6. **Literacy**: One who can read and write his name is considered a literate person. But this competence is inadequate from the point of view of the requirements of the present-day society. According to United Nation’s Organisation, the literate is one who has ability to read and write. One who can read but cannot write is considered ‘semi-literate’. According to census of India, “a person who can both read and write with understanding in any language is to be taken as literate”.

7. **Urbanisation**: Urbanisation is the process by which villages turn into towns and towns developed into cities. However, there is no universally accepted definition of urbanisation. Different countries adopt different criteria for defining urbanisation or urban settlement. In India an urban area is defined as follows,

I. All places with a municipality, municipal corporation, cantonment board or notified town area committee etc.

II. All other places, which satisfy the following criteria,

a. a minimum population of 5000
b. at least 75 per cent of male working population engaged in non agricultural activities and
c. a density of population of at least 400 persons per sq km
7. **Work**: In the census, the term ‘work’ is used in a special sense and therefore stress should be applied to understand it correctly. ‘Work’ may be defined as participation in any economically productive activity’. Such participation may be physical or mental in nature. ‘Work’ involves not only actual work but also effective supervision and direction of work. It also includes unpaid work on farm or in family enterprise.

8. **Worker**: According to census, any person whose main activity was participation in any economically productive work either by his physical or by his mental activity was classified as worker.

### 1.8 DATA BASE

Geography is a science, based on empirical studies, which requires data collection from various sources, to fulfil the objectives outlined above. The data source related to the study area is secondary in nature. For any type of study of population, it is essential to have an up-to-date data and reliable information related to population of the study area. The present study is entirely based on secondary data. For comparative study of India, Maharashtra and the Pune Division, data was collected for last 100 years (1901 to 2001), and district-wise population structure was analysed from the data for the same period, while, tahsil-wise data was collected for the period of 30 years *i.e.* from 1971 to 2001. The mandatory data was collected from the following sources.

1. Census of India: census publications such as census reports, census special tables, papers and sample survey reports,
2. Data published by the government of India and Maharashtra and also compiled through various publications by the respective departments,
3. Socio Economic Abstracts for concern years and concern regions,
4. Miscellaneous sources for population data

In addition to these main sources, there are many other sources, which are used to collect information related to population, such as Population
Registers, District Census Handbook, records maintained by different Government Offices, Periodical Reports, etc. The data and information regarding physiography, soil and climate is collected from the toposheets and Gazetteer of Maharashtra.

1.9 METHODOLOGY

District is the basic unit of the present study for the temporal analysis. However, the spatial analysis has been carried out by using tahsils as the basic unit for the investigation. The study is related to the spatio-temporal changes in the structure and distribution pattern of population, in Pune Division of Maharashtra. The data is collected from secondary sources. For analysing this data, various appropriate statistical techniques like percentages, averages have been employed. The maps and diagrams are prepared by employing various cartographic techniques such as bar and line graphs, pie diagrams and choropleath techniques for better comprehension. The values thus derived for the total population, male-female population, literate population and the population have been tabulated. Some mathematical and statistical equations are used to obtain the results, these are as follows –

1. The population density was calculated with the help of general equation, as follows –

\[
\text{Population Density} = \frac{\text{Total population of the tahsil}}{\text{Total geographical area of the same tahsil}}
\]

2. The Population Concentration Index (PCI) was calculated with the help of following equation –

\[
\text{PCI} = \frac{\text{Actual Population of the tahsil}}{\text{Average population of study area}}
\]

3. To calculate the rate of population growth following formula was used:

\[
r = \frac{P_n - P_o}{P_o} \times 100
\]

Where,

\[
r = \text{Growth of population in percent}
\]

\[
P_n = \text{Population in latest period}
\]

\[
P_o = \text{Population in the past}
\]
4. For analysing the population growth, birth rate of the tahsils was also calculated –

\[ \text{CBR} = \frac{B}{P} \]

*Where,*
- CBR = Crude Birth Rate
- B = Total number of births in the tahsil during census year
- P = Total population of in the same tahsil during same census year

5. For analysing death rate –

\[ \text{CDR} = \frac{D}{P} \]

*Where,*
- CDR = Crude Death Rate
- D = Total number of deaths in the tahsil during census year
- P = Total population of in the same tahsil during same census year

6. For analysing relation between birth rate and death rate we have calculated Arithmetic Mean and Correlation with the help of following formulas –

   i) For Mean –

\[ \bar{x} = \frac{\sum x}{N} \]

   ii) For Correlation –

\[ r = \frac{\sum xy}{\sqrt{\sum x^2 - \sum y^2}} \]

7. The sex ratio was calculated with the help of general equation –

\[ \text{Sex Ratio} = \frac{\text{Total female population in the tahsil}}{\text{Total male population in the same tahsil}} \times 1000 \]

8. The literacy rate was calculated with the help of following equation –

\[ \text{Literacy Rate} = \frac{\text{Total literate population of the tahsils}}{\text{Total population of the same tahsil}} \times 100 \]

9. The following formula was used for analysing degree of urbanisation –

\[ \text{Degree of Urbanisation} = \frac{\text{Urban population of the tahsil}}{\text{Total population of the same tahsil}} \times 100 \]
Wherever necessary, the data is represented with the help of suitable cartographic techniques, like line graph, bar graph, pie charts and choropleath maps. Various statistical methods and quantitative techniques have been used to determine the relationship between various demographic characteristics. Comparisons have also been made between districts as well as tahsils in the study region. Further, statistics for the region have been compared with those for Maharashtra and India. With the help of above-mentioned cartographic and statistical techniques, various elements of population like population distribution, population density, population growth and occupational structure are presented.

1.10 IMPORTANCE OF RESEARCH WORK

The present research work embodied in the thesis addresses the issues related to the various aspects of population structure in the context of Pune administrative division in Maharashtra state with cause and effect analysis, a geographical perspective. The importance and the utilisation value of research work are listed below.

1. The knowledge of population structure is useful to the population geographers, teachers and students of Population Geography in particular and Geography and other social sciences like Sociology, Economics, Political Science, Demography, etc. in general.

2. It is a comparative and analytical study covering many aspects of population structure. Hence, it will provide guidelines to the planners and will be helpful in regional planning.

3. It includes the analysis of sex ratio, which will guide the administrators and social workers for the implementation of programmes of improvement of sex ratio. Thus the study is useful to both GOs and NGOs.

4. The study will provide guidelines to the administrators for the regular administration work.
5. The study will provide a guide line to the researcher in the field of population geography and demography.

1.11 REVIEW OF LITERATURE

To clarify the concepts and to obtain a better understanding of the research, various references have been made. For this purpose, various seminal works on this topic executed at the international, national and regional level by various geographers and expertise of the other discipline have been taken into consideration.

Population Geography though young branch, is a dynamic field of Human Geography. Eminent population geographers like Beaujeu Garnier (1960), Demko, G. J. (1970), Clarke John (1972), Woods Robert (1979) and Jones, H. R. (1990) have contributed immensely by focusing on the issues to be addressed by population geography and have firmly laid foundations.

As far the Indian Population Geography is concerned, Chandna and Sidhu (1980), Mamoria (1981), Rajhans (1984), Chandna, R. C. (1991), and Bhende and Kanitkar (1999) have made valuable contribution, specially Chandna’s work “A Geography of Population- Concepts, determinants and Patterns” provides a sound methodological framework for students working in the area of population geography. It deals with the factors controlling the magnitude and regional patterns of various attributes of population. It also reviews the development and the progress of population geography in India. Munsi (1988, 1996) discussed the problems in the development of population geography and focussed the attention to the need to apply scientific methods in the field of geographical research and study. While Krishnan (1997) in his overall view of population geography in India puts forward a strong case of fostering Historical Population Geography, which will lead to policy research.

The years 1921 and 1951 are often referred to as the critical divides in India’s population growth since the beginning of the last century. But according to the study made by Krishnan and Kant (1984), it holds good only for one third of the India. Natural increase responds to the fertility and
mortality behaviour of the region. Sing, K. P. (1989), in his work, carried out fertility differentials in various religious groups in India. Sawant, S. B. and Khan Yusuf (1989) in their study, dealt with the analysis of the factors affecting the natural increase of population at three levels *i.e.* international, national and the state. Mahadevan Kuttan (1994) attempted to establish a linkage between different parameters of development within the demographic transition at the national level. Govarikar Vasant (1994) analyzed demographic transition for India based on natural increase.

The socio-cultural and economic expression of society is measured by means of sex ratio, literacy, religion, language, occupational structure etc. The study undertaken by Chandna and Sidhu (1997) focused on the understanding of the working of determinants of sex ratio rather than the regional variation in the sex ratio. Chattopadhyay Srikumar (1988) studied some features related to urbanization trends in Kerala, where as Lahari Kuntala Dutt (1986) brought out the characteristic features of urbanization in Lower Damodar Valley. Sharma, K. D. (1992), while studying the pattern and process of urbanization of Himachal Pradesh revealed a preferential dichotomy in the establishment of British and Indian towns in different elevation zones of this Himalayan State.

Presently micro level studies are gaining their due importance as they give a fine grain analysis and enable the researcher to draw a better picture at the micro level. Bhatt, S. and Bhatt, H. (1986) studied Pinswar, a high altitude rural settlement in Garwal Region, where the findings revealed that the morphology of the village was more an outcome of physical than cultural factors. Bishsel Ulrich (1983) identified and interpreted that the share of fertile and irrigated land holdings and occupancy of best settlement site and large houses characterize socio-economic and spatial expression of a dominant caste in Indian villages.

Jones Huw (1990) contributed in the population geography with some fundamental concepts. Shrinivasan (1995) studied the regulating reproduction in India’s population. Sawant and Athawale (1994) contributed a major role in the study of population geography, while Munsi (1996) did an excellent work


Joshi (1976), Mitra (1993) and Gupta and Prajapati (1998) focused on the labourer and their problems. Joshi commented on problem of surplus labours in Mumbai in his book, while Mitra discussed the structural problems,
which were created because of migration of labourer in search of employment, similarly, Gupta and Prajapati focused on the migration of agricultural labourers in Chhattisgarh.


Battacharya (1998) made a district level analysis of urbanisation and human development in West Bengal; he further made the comparative analysis with inter-state variation, as well Siddharth and Mukherjee (1999) highlighted cities with urbanisation and urban system. Kingsley Davis (1967) brought out the origin and growth of urbanisation in the world. Gibbs (1966) commented on measures of urbanisation, while Lampard (1965) studied some historical aspects of urbanisation.


1.12 ORGANISATION OF THE STUDY

The present research work, presented in the thesis has been organised into nine chapters. The chapter scheme with the topics presented in the chapters is given below.

Chapter 1: Introduction

The outline or the frame work of the research is presented in this chapter. The basic concept of population geography and the development of population geography in brief have been presented in the chapter. Other important aspects included in the chapter are the objectives of the research in
general and particular, nature of research, applied value of research, data base, methodology, brief information about area selected for the study i.e. study region, review of literature and lastly the scope and limitations of the research work. Necessary justification for all the aspects has been given.

Chapter II : A Geographical Profile of the Study Region

This chapter is a conventional chapter, which describes the physical personality of the study region i.e. Pune Division. This chapter includes the location, geology, physiography, drainage, soils, vegetation, climate, agriculture, general landuse, industrial structure and transport and communication. All these are the factors responsible for the distribution of population in the study region.

Chapter III : Population Distribution

This chapter deals with spatial distribution and density of population and the decadal changes in both these aspects. To understand the spatial organization of population within the region, the density and distribution of population over the years has been analyzed in a spatio-temporal perspective. The density zones have been determined for the study region. Population concentration indices have been worked out and analysed.

Chapter IV : Population Growth

In this chapter, temporal growth patterns of population at the district as well as at the tahsil level are analysed. In general, fertility, mortality and migration together influence the growth rate. This chapter also highlights the analysis of distribution and changes in birth and death rates of the study region. It also deals with the factors responsible for the same. Zones of population growth have been presented in the chapter.

Chapter V : Sex Ratio

This chapter deals with the concept of sex ratio, changing trends in the sex ratio. It also highlights the district-wise sex ratio and spatio-temporal changes in it, the factors responsible for the changes in sex ratio in the study
region have been discussed. Various zones of sex ratio are also presented in the chapter.

Chapter VI : Literacy

The concept of literacy and the study of changing trends in the literacy are included in this chapter. It also focuses on the factors responsible for the changes in literacy rate in the study region. The trends in literacy, district-wise and tahsil-wise literacy, spatio-temporal changes in literacy and zones of literacy are presented in the chapter.

Chapter VII : Patterns of Urbanisation

In this chapter, concept of urbanisation and the district-wise trends of urbanisation have been presented. Spatio-temporal perspectives of the changes in urbanisation for different tahsils have been highlighted. Decadal variations in urban population at the level of tahsils are also presented in the chapter along with the classification of towns.

Chapter VIII : Occupational Structure

This chapter covers the concept of work and the occupational classification in the study region. It also includes the district-wise changing trends in three fold categories i.e. Main Workers, Marginal workers and Non-workers in the study region, along with the spatio-temporal analysis of changes in occupational structure at the tahsil level. Various zones of distribution of working population have been discussed in the chapter.

Chapter IX : Conclusion, Problems and Recommendations

This chapter deals with the conclusions of the study and the problems of the study region in respect of the population structure. Overview of the research work has been done in the chapter or the logical outcome of the research work from of inferences located the problems and made suggestions in the chapter. Ultimately we have given some recommendations so as to find solutions and act accordingly. The thesis has been supported by 29 tables and 52 figures including maps and diagrams. In the annexure of bibliography some 102 references have been given.
1.13 SCOPE OF THE RESEARCH WORK

The topic of the present research work is Spatio-Temporal Changes in Population Structure of Pune Division of Maharashtra. Work embodied in the thesis is the analysis of the census data from a geographical point of view. Hence, it is a geographical perspective; which includes the study of growth, distribution and density of population, so also the sex ratio, literacy and urbanisation in the study region.

The area selected for the study is Pune administrative division in Maharashtra state of India. The analysis of population data of five districts divided in to 58 tahsils has been carried out. The census data taken for the study is from 1901 to 2001 i.e. hundred years.

1.14 LIMITATIONS OF THE RESEARCH WORK

It is our responsibility to mention the limitations of the work embodied in the thesis. Spatially speaking the area selected for the research work is Pune administrative division in Maharashtra state. As mentioned earlier all the five districts and all the 58 tahsils in the division have been taken in to consideration for the purpose of comparison of population statistics of the state Maharashtra and India are also taken into consideration. We are not considered other divisions in the state or other states in India.

Temporally speaking, our study is limited to and based on the population statistics of last century census, i.e. 1901 to 2001 for the purpose of district level study. While studying at the tahsil level we have taken into consideration census data from 1971 to 2001. Thus, tahsil-level comparison is limited to a period of three decades.

Our study is limited to growth of population, density and distribution of population, sex ratio, literacy and urbanisation in the study region during the century under investigation. However, we have not considered the classification according to religions or castes. Our study of the occupational structure is limited to the three categories viz. main workers, marginal workers
and non-workers. We have not taken into consideration the details of classification of the occupations.

In the style of presentation, references are given at the end of each chapter, which are referred as source of information. Important tables are given and maps, graphs and diagrams are prepared for the better understanding. The researcher himself has processed all concerned data. As far as possible, and effort had been taken to reduce errors and repetitions. Yet through oversight, some errors might creep in the text for which the researcher may be excused. The researcher will be satisfied even if this work adds very little to the existing knowledge in the field of population geography.

REFERENCES


