CHAPTER - I
GEOGRAPHICAL PERSPECTIVES ON POPULATION AND FOOD SYSTEM IN SOLAPUR DISTRICT

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CHAPTER - I

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1.1 INTRODUCTION:

Today, the most alarming problem before the country is the accelerating growth of population. This is not so serious in the most developed and technologically advanced countries of the world. The problem of population explosion is considered acute in the underdeveloped and technologically developing countries. The basic and fundamental needs for mankind in day today life are food, clothes and shelter. Without food, man cannot sustain for longer period. Though, man can prolong life without food for a short period of time, depending on other sources of calories. The home is needed for man but without house man can live for a considerable period. Clothes are also not so important to sustain for existence as food is necessary. This clearly indicates that among three basic requirements for the survival of mankind, food is the most important.

Among the developing countries of the world, the high growth of population has threatened the future generations. To know per capita supply of the food and how per capita income appropriate and relevant are here, to maintain about the future dangers which have been deeply analyzed here by Malthus and many others. The brief discussion of Malthus theory may be analyzed here which will enable us to understand, the nature of future problem of food demand and supply, lie said that the population of the world is increasing at the rate of geometrical ratio while the food production is increasing at arithmetic ratio. Although, Malthus is not entirely correct, as in the 20th century, green revolution has surprisingly increased the food production rate than the growth rate of
population. But the reality of the natural resources cannot be denied. The natural resources of the world with exceptions of solar energy, wind energy and water energy are limited and fixed. The land which is cultivable is already under the cultivation and further extension of the agricultural area is not possible, if further; extension for the cultivable area is done than it will be possible on the cost of deforestation. At present, deforestation is not desirable since for the balanced ecosystem about thirty three percent area is needed for vegetation. Except, some of the area such as equatorial region of Africa and Latin America, have only required ecological proportion of forest, rest of the world is not showing thirty three percent areas under forest. In India the proportion of forest is needed about one third of the total geographical area under forest but it is below twenty percent. At present, this discussion has great relevance with the Malthus predictions; no doubt the nature has the great power to balance the stage of disequilibrium. From the history it has been seen that from time to time, the nature has made its own plan in the balancing the cycle of life.

The history of the growth of mankind during the last ten thousand years clearly reveals that the population by and large was low in relation to the existing resources. This may be attributed to the high death rate and insecure food supply and natural calamities. But the population gradually started growing and multiplying, after sixteenth century. Roughly, about five thousand years took for doubling the population there after, it took almost five hundred years and then it doubled in about one hundred fifty years and in the twentieth century population has increased almost four times. And it took almost fifty years for becoming double and it is going to take not more than twenty five years to become double now.

This can be concluded that the growing population of the district due to both natural increase and contribution made by net migrants is not
keeping the pace with the growth rate of food production. The region, therefore, is facing the problems of food scarcity.

Within the state of Maharashtra, the Solapur district occupies a very significant position both in terms of area and population. It is lies entirely in the Bhima basin. The Solapur district tantaliraly constitutes 4.88 percent area and 4.51 percent population of Maharashtra state. In other words, the region under study ranks fourth in terms of area and seventh in terms of population among the districts of Maharashtra. In view of the preceding discussion related to "Geographical Perspectives on Population and Food System in Solapur District" has been considered which will enable us to understand the nature of problems precisely in the region under study.

1.2 SIGNIFICANCE OF POPULATION GEOGRAPHY:

At the very outset, it is most appropriate to define the term population, geography. It is, therefore, necessary to describe the term population geography and also explain its scope and aim. But we may first start with the term demography, as a field of enquiry, originated in 1662 with publication of John Grants observations, but the term seems to have been first used by Achilte Guillard in 1855. A working definition of this word is given in Houser and Deccan. The study of population as the study of size, distribution and composition of population and changes there in and components of such changes, which may be defined as fertility, mortality and territorial movements, form elements of demography.

The role of geographers, in population studies is well expressed in the words of Gamier. It is business of a geographer to describe the facts in their present environmental context studying also their causes, their original characteristics and possible consequences with the above preamble, a definition of population geography can now be attempted,
population geography may be defined as the analysis and geographic interpretation of spatial variations of the structures and values of demographic phenomena". These phenomena consist of size and changes of population and various population processes such as fertility, mortality and mobility.

It may initially be necessary to explain the reasons for enhanced interest in population studies. Firstly, the tremendous growth in population of the world during the past few decades is a matter of great concern. Three centuries back, the world population was five hundred million. It has swollen to more than six thousand three hundred million. This has of course, became possible because of man's conquest over many diseases on the other hand the lack of birth control especially in the underdeveloped countries has resulted in the unpredicted growth in human numbers. The contents of population geography have varied slightly from author to author, but there is essential unity. Trewartha has given a tentative system of content and organization of the subject. There are three sections viz geography of population in past, population number and qualities of population and their regional pattern of distribution.

Beajuea Gamier also considers three aspects of population geography viz. the distribution of people over the globe, the evaluation of human societies and degree of success, which they have achieved. It is interesting to note that only the first and last aspects have generally been considered in human geographical studies, but the second i.e. evaluation is equally important. This aspect of evaluation includes both in population development i.e. births, deaths and displacements. A more advanced study of population can form a course in applied geography. This means that the specialist has the following topics

1. The nature of population geography
2. Elements of population geography
3. World population distribution, growth and economic development.
5. Urban population of the world social characteristics of the urban population. Urban population growth and industrialization.

It must, however be remembered that various aspects of population will have to be covered by certain other branches of applied Geography as well, for instance, urban planning, regional planning. Alter all, any planning is meant for benefit of humanity. The present research work is associated with Agricultural Geography and Population Geography we can say the research work is the part of Agro-Population Geography. Therefore these two branches of geography are quite significant in the study.

1.3 SIGNIFICANCE OF AGRICULTURAL GEOGRAPHY:

Land is the most significant component among the natural resources of the world and most of its inhabitants depend on it for their livelihood, yet the average yield of country remains to be one of the lowest in the world. In general, most of the villages suffer both from under nutrition and malnutrition. Agriculture includes all plants, poultry, birds and animal products for direct or indirect consumption by human beings. Apart from food, agriculture meets many other needs of man from cultivation of plants and rearing of animals. So long as the need for such supplies continues to be a problem, man will continue to seek information on not only how but also from where human requirement are to be met. Almost all the nations of the world have embarked on agricultural production, with accent on establishing the nature of conditions surrounding that production in specific areas, the conditions favourable to instituting the same in areas not currently devoted to that purpose. Many nations of the world have been acquiring precise information as to where
supplies of such agriculture products may be most effectively obtained as can meet their ever growing domestic need. Such information can be supplied by agricultural geographers which in fact highlights the significance of agricultural geography in the present development context. To sum up, the major objective of agricultural geography is the analysis of the agriculturally developed areas and their natural, economic and social relationship and organizations as reflected spatially. Such agricultural geography studies are necessary for transformation activity of man, particularly for planning and development purpose.

The significance of agricultural geography is that it provides help and guidelines for decision makers and is useful for:

1. The agricultural specialist, who improve the structure of agriculture.
2. The food economist would like to increase the production of food stuffs.
3. The irrigation engineer, who plans to introduce new irrigation schemes,
4. The regional planner, who is on the lookout for the most favourable location for recreation areas.
5. The transportation engineer, who has to lay new rail and roads,
6. The demographic planner, who plans public services and utilities.

1.4 SELECTION OF THE TOPIC:

The topic entitled, "Geographical Perspectives on Population Food System in Solapur district" has been selected for the study. The selection of the topic for the research analysis is not very arbitrary, since no study of the relationship between food system and population has been undertaken for analysis in depth from trie point of view of Geography so far. Some of the work at national and international level has been done
which gives a generalisation of the problem minutely of the relationship between food and population. The study associated with the meso and micro level will provide more authentic and correct information for the purpose of planning which must reduce the problems of the deficit of food. On the other hand the micro level studies only provide general outline of the facts and problems existing in the region. The selection of the topic for research, in fact is difficult task because researcher should furnish the exact justification. Any research work indeed is undertaken to solve the problems of the region or society. At present, the rapid growth of population has dislocated the facilities of demand and supply of food and other necessary infrastructure of the region understudy. This is due to unequal distribution of natural and human resources. Land resources such as fertile soil are also unevenly distributed over the globe. In order to bring out the stage of equilibrium between the deficit and surplus food among the people, this kind of research is very necessary. These kinds of research become the planners to overcome for population and food problems in any particular region. All these point keeping in mind, it has been entitled, "Gographical Perspectives on Population and Food System in Solapur district".

1.5 SELECTION OF THE REGION:

For the researcher, it is easy to understand the problem of its own region; it is in fact, natural that a person is more acquainted with the facts and the problems of the region where he resides. In addition to this, the region is more accessible to the researcher for collecting the data and information. The selection of the region is also concern with the magnitudes of the problems in, that region. Hence, for present study the Solapur district has been selected. This district experiences high growth
rate of population due to large scale of in-migrants from other parts of the country.

Solapur district has large number of the people who do not produce their own food. Therefore, the food problem is more serious in the Solapur district due to the scarcity of the food locally available. It is necessary to increase the food production by implementing new innovative methods because the carrying capacity of Solapur district is much more than existing population of the district. In this way, the production rate of the food may be enhanced; on the other hand the growth of the population may be checked by creating the social awareness among the people. The major idea behind the selection of region namely the Solapur district for the research is to analyze its problems associated with the food and population. The region study is very peculiar as indicated by the preceding discussion. In view of all these above mentioned points, the region, namely the Solapur district has been selected for the research purpose.

1.6 HYPOTHESES:

Hypotheses, infact, are the basis of any research. These are facts and realities that exist in the region. Hypotheses are the presupposition on which entire research work is based. Hence, hypotheses are foundation and basis to the research to be carried out of a particular problem. No study can be carried out without forming certain hypotheses.

The hypotheses of the study, on Geographical Perspectives on Population and Food System in Solapur district” have been formulated as under:

1) The growth of population is high both due to natural increase of population and in-migration.
2) Birth rate is still high while death rate due to improvement in better
medical facilities is considerably declining.

3) The per capita land holding is also declining day by day, in the Solapur district.

4) The proportions of cultivable land are being occupied by industrial establishment, transportation network and for residential uses.

5) Land under irrigation is increased, but large share is under commercial crops.

6) Food grains is the important source of energy in Solapur district other food sources are costly and not affordable by common man.

7) Availability of food grain is less than the actual food production; wastages are more from farm to the house.

8) A large portion of society is living in urban areas having high per capita income does not produce their own food but consume maximum, therefore, surplus deficit ratio is adverse.

9) The industrialization in the Solapur district is rapidly increasing and resulting in high degree of in-migration for better employment opportunities.

10) Industrialization has open the way for high degree of urbanization in the Solapur district.

1.7 OBJECTIVES OF THE RESEARCH:

Without objectives no study can be fulfilled, as a matter of fact, the chief purpose of the researcher is to obtain the results by fulfilling the objectives. Every authentic study is carried out on the basis of certain objectives. Objectives indeed are the goal to be achieved by the researcher. The present study entitled, "Geographical Perspective on Population and Food System in Solapur district" has the following objectives.

1. To assess the growth of population distribution and pattern of
urbanization in the region,

2. To reduce the growth of population by lowering the rate of immigration and also by lowering the birth rate.

3. The third objective is to secure the supply of food to the entire region under study.

4. The forth objective is to enhance the productivity of food per hectare of land.

5. To analyse the deficit and surplus region in food production in the Solapur district.

6. To assess the availability of food production in each district of Solapur.

7. To evaluate the demand and supply of food in different parts of the region under study.

8. To find out total requirements, surplus and deficit calories and per capita requirement surplus and deficit calories in the region.

9. To find out the availability of per capita per day cereals and calories in the region.

1.8 SOURCES OF THE DATA AND INFORMATION:

Any kind of research analysis is not possible without information and data. The data and information, intact, are the tools for research. The sources of data and information are many but among the various sources the data published by the Government of India in the form of different reports and census are easily available. For the research analysis of the present study, the general population table, published by the census of India, statistical abstracts of Maharashtra state and some published reports by Directorate of Agriculture Maharashtra state have been extensively used. The secondary data has been the major source and base for present study. Besides, the unpublished data and theses have been
used as a reference work. Gazetteers of Maharashtra and district census handbook have been used for the analysis. Socio-economic reviews for Solapur district have also been used for purpose.

1.9 METHODOLOGY:

The data and information collected from different sources were processed and organized in the table form. The processed data is represented in the form of percentage and proportions. This data is represented with various cartographic techniques. The choropleth maps, isobaric maps, graphs and bar graphs and many other cartographic techniques have been used. The data has also been used for the various statistical methods. The data collected, has been used for calculating the coefficient of correlation analysis and correlation matrix. The results, thus, obtained have been analyzed and interpreted accordingly.

1.10 THE REVIEW OF LITERATURE:

Before one starts working on a particular concept, at the very outset its origin and development should be considered. It would be more useful for comparing the views of work done earlier. Brief account of the work done earlier is given below:

1. DAS K.N. (1973)

He has studied the population pressure and intensity of cropping in the Kosi areas of Bihar. In his study, he has used statistical methods to find out correlation between population pressure and intensity of cropping. He has used Pearson's correlation co-efficient method. Students "t" test and rectilinear regression of y upon x by the method of least squares has been applied.
He has observed that population growth without a substantial increase either in the area of cultivation or elsewhere, he suggested that the problem of increasing pressure of population can be solved by two ways. Firstly, an increase in yield is to be brought about by making more intensive land use and secondly a higher production per acre is to be obtained with the help of adequate irrigation facilities use of organic matter and chemical fertilizer and high variety yield Seeds.

2. Pyre, Ram (1976)

He has studied the spatial distribution and temporal trends of population in Bundel khand region. In his study, he has suggested that the region should be planned in such a way that its resources which have not yet been fully utilized may get due attention and the imbalance in growth should be checked.


They have studied the population pressure on agricultural land in south Maharashtra; by measuring the pressure of population on agricultural land. They have computed different land use densities such as crude physiological, agricultural, nutritional and caloric. They have also computed the relative coefficient of over population. Their study shows that the relative coefficient of over population of the region was 1.49 and that for Maharashtra state was 0.76. The region exhibits an example in south Maharashtra with its increasing pressure of population on agricultural land, which is more pronounced in plains than upland part of the region. In their study, they have suggested that for minimizing the pressure of population on agricultural land, agricultural production has to be substantially raised by making more intensive use of land.

He has also studied population pressure and intensity of cropping in Assam. The objective of his study is to find out association of population pressure and intensity of cropping on the basis of the Boserupian Model of agricultural growth. In order to achieve this objective, the hypothesis postulated is that there exists a positive correlation between population pressure and intensity of cropping in Assam. The hypothesis was tested by the statistical technique of correlation regression analysis.

He has observed that there is a considerable scope for increasing the area under double or multiple cropping though there are physical limitations. He also observed that abnormal growth rate of rural population resulting high rural density leads to the problems of over population in agricultural sectors.


They have worked on the factors in influencing growth of population in western Maharashtra. They have taken into consideration various socio-economic factors and calculated a correlation matrix in order to understand impact made by these factors on growth of population. It has been found that in western Maharashtra the natural increase of population in general and birth rates in particular are high as results of high death rates in western Maharashtra.


They have analyzed population growth and agricultural changes of Madhya Pradesh. The aim of this study was to see how far, population pressure has been responsible for introducing agricultural changes in Madhya Pradesh which was the largest state of Indian Union.
They have studied spatio-temporal patterns of population growth during 1901 to 1981 and changes in agriculture in perspective of growth of rural population and agricultural changes during 1911 to 1981. They also studied changes in net sown area irrigated area, area sown more than once growth of area under high yielding variety of seeds, use of fertilizers, changes in productivity, changes in value of crops and changes in the average yield.

They concluded that from the point of view of food supply the state has reached the critical stage. To meet this challenges there is urgent need for i) reducing birth rate ii) intensifying farming using yield raising technology instead of colonization iii) Promoting the growth of small and cottage industries in rural areas of the state.


He has studied agricultural responses to population differentials in the Punjab- Haryana Plain. He has used different statistical techniques to correlate crop yield with population pressure. He has found that the crop yield and pressure of population are having a positive relationship.

8. Dr. Dubcv, R.S. (1987)

He has studied the population pressure and cropping pattern with relation to food availability in Madhya Pradesh. In his study, he has used different statistical methods to find out productivity in the region under study and its correlation with food availability. He has studied the available calories to the existing population. He has published his work under the title of Agricultural Geography: Issues and Application.

9. T.Penclalaish and Y.V.Kamanaiah 1992

They have studied the spatial analysis of rainfall in the drought prone area of Cuddapah district of Andhra Pradesh. In this study, an
attempt is made to describe the spatial distribution of rainfall, rainfall intensity, rainfall ratios, rainfall variability and rainfall frequency in Cuddapah district on seasonal and annual basis. Rainfall from 1901 to 1988 was taken for nine rain gauge stations for analysis.

Author has found that the decadal analysis of rainfall intensity of the winter season was low intensity during 1931-40 and 1951-80. During summer season, the decadal variation in rainfall intensity showed an increasing trend in 1910, 1920, 1940, 1950 and 1960. During south west monsoon period, the trend analysis of intensity of rainfall indicated on mean case during 1920, 1930 and 1960. During 1950 and 1970, the intensity of rainfall was low. The decadal analysis of coefficient of variation of rainfall during the winter period has showed higher variability in the decades of 1910 and 1950. Author found that the values of coefficient of variability of rainfall were comparatively low during summer period. Low rainfall ratio was noticed in 1920, 1930 and 1940. Moderate rainfall ratio values were found during 1950-1970 while in 1980 the ratio values were high.


He has studied irrigated agriculture: a case study of West Bengal; Author has collected official as well as field survey data. The main objectives of the studies were (i) to highlight the basic problems that have made irrigation a necessity, (ii) to assess the physical setting of irrigation by a detailed appraisal of the surface and ground water resources as well as their influence on the types of irrigation in the state, (iii) to assess the impact of irrigation on land use, cropping intensity, cropping pattern as well as on agricultural efficiency by macro and micro level analysis. Author has used linear regression technique for calculating trends and probability of rainfall in West Bengal. Impact of irrigation on land use
cropping intensity and crop yields have been depicted by the Pearsonian correlation coefficient. She used wilconxon ranked pair test to check the significance of change between 1960-1980. Author has not only carried out a comprehensive study of the irrigated farming now practiced in West Bengal but also undertaken an analysis in depth of irrigated agriculture in selected villages of the state. The researcher has considered the problems not only from the physical point of view but also assessed the socio-economic aspects of the problem.

The researcher has found out that irrigation potential of west Bengal was not fully utilised. During the period of investigation only thirty six percent of gross cropped area was availing irrigation facilities. Author has pointed out that the growth rate of irrigation during the period of 1995 was somewhat sluggish.


He has studied agricultural transformation in Nanded district (M.S.). The entire work is divided into eight chapters and in the first chapter he throws light on meaning of agriculture and agricultural geography, aims and objectives, methodology and review of literature. Second chapter deals with physical setting while third chapter is devoted to non physical determinants of agriculture. Forth chapter throws light on general land use, where as the fifth chapter explains agricultural cropping pattern in the study region. The sixth chapter has dealt with the production and productivity of the various crops: while seventh chapter throws light on case study of villages. In the last chapter, the author has drawn some conclusion and he has suggested remedies to solve them.

Author has used primary and secondary data for the study. He has used data for the period of 1960-61 to 1991-92. For the study of population characteristics author has calculated various densities such as
caloric density, nutritional densities, and agricultural density etc. He has calculated indices, moving averages, volume of change, correlation, regression, compound growth rate etc. for the study of trends of area under various crops, for their production and productivity. He used Weaver's and DoPs methods for the calculation of crop combination.

Author found various problems such as unequal distribution of rainfall, soil erosion, problem of high population pressure, lack of irrigation etc. He has given proper remedies to solve them. Author has also found that there is a gradual transformation of agriculture from food crops to cash crops in the study region.

12. Dr. T.C. Sharma and Dr. C.S. Badiger (2003)

They have studied recent trend in crop production in Karnataka - A post facto enquiry. The present enquiry analyses in growth position in the production of principle crops growth in the state of Karnataka for the 1966-1990 period with a view to clearly justify the crop with a lower growth and the probable causes thereof. The study is purely empirical in nature, its result based on the volume of change in production between 1966-69 and 1989-90 its decomposition into yield Xi and area components compound growth rates for the 1966-69 and 1980-90 period and co efficient variation for 1966-90 period were found out.


He has studied sustainable development of a traditional agriculture in Goa: A case study of "Puranxeti". The Puranxeti is highly productive and unique in its method but leads for heavy anthropogenic erosion and environmental damage which seems to be irreparable, as field preparation is carried out every year. In this paper, a sincere attempt has been made to analyze and project the dimensions of such method in terms of
geographical, social, economic, cultural and environmental related problems.


The author has studied impact of population factors on agricultural development in Jorhat district of Assam. The main objective of the paper is to undertake to examine the effect of population factors on agricultural development, and to suggest the development strategy of agriculture in the light of the population in Jorhat district of Assam.

Author has used primary and secondary data for the study. For example field survey, sample survey, face to face interview, the statistical handbook published by government of Assam. Census publications, various books journals and other to which periodicals have been used. He has calculated population variables and these have been examined.

Author of the present article has made an attempt to examine the impact of population factors on agricultural development in an area with high agricultural potentialities and abundant human labour in Jorhat district.

**1.11 ORGANISATION OF THE WORK:**

The present work undertaken for study entitled "Geographical Perspective on Population and Food System in Solapur district" has been organized in the following manner:

1. The **first chapter** deals with the introduction, the points which have been considered in this chapter are the existing problems of population in the world in general and developing countries in particular. Similarly, the intensity of food problem and population pressure in Solapur district has been discussed. The significance of the topic for selection for study has been considered. I he justification of the region under study has also been taken into
account. This section also considers different sources of data and information for analysis, along with certain methods adopted for the purpose. Some of the hypotheses have also been formulated before the actual work. Objectives have also been included in this section.

2. The **second chapter** is concerned with the backgrounds of the region. To start with the extension and location of the region, the physical background which includes the physiographic regions, climate, the temperature and pattern of rainfall, the soil types and distribution of vegetation types etc. The social background is also briefly discussed. The social background takes into consideration, the proportion of various religious communities and scheduled caste and tribes. Besides, the proportions of literates and urban population have also been discussed.

   Economy is the backbone of a region. The development is intimately related with the economic condition of a particular region. The per capita income is influenced by it, which in turn is reflected in the standard of living of the people in the region. The agricultural situation such as the land utilisation, cropping pattern, industrial workers etc. have been discussed in the economic background of the region. Historical and political backgrounds of the region have also been briefly taken into account in the second chapter.

3. The **third chapter** is associated with the growth of population and birth rate death rate and infant mortality rate in Solapur district.

4. The density and distribution of population make the subject matter of **fourth chapter**. Rural and urban densities have been considered in this chapter.

5. The **fifth chapter** is concerned with the composition of population
in Solapur district. The composition and structure of the population are very important aspects to understand the various characteristics of the population in the region. Age is the index of capability, which decides many aspects for the development, defense education, working pattern and employment in the region. Dependency burden has also been calculated with the help of age groups. Apart from this the chapter fourth also deals with the occupational structure and literacy pattern.

6. The **chapter sixth** is associated with the land use pattern in Solapur district. The pattern of land utilization gives an idea about the development and the growth of economy in the region. The land use pattern may be broadly considered in to two categories. Firstly the general land use pattern which includes the proportions of barren land, cultivable land, forest land, to the total geographical area. Secondly the cultivable land or agricultural land is divided into various crops under which the land is sown. All these points are concerned in the subject matter of the sixth chapter.

7. The **chapter seventh** deals with the food production and marketing in Solapur district. The Cropping pattern in the area under study is discussed in this chapter. In the Solapur district food production is affected by irrigation facilities and size of the land holdings. Production of different food grains is analyzed temporally and spatially in the sixth chapter. Agricultural productivity is the quantitative and qualitative measurement of production and inputs required for the yield and output. Agricultural productivity in the Solapur district is discussed in the sixth chapter. To solve, the food problems in Solapur district a suitable way is, only to increase the production per unit of area and per unit of time. Hence, a measurement of the existing agricultural productivity becomes
necessity before any remedial approach can be taken. In this chapter agricultural productivity in the area under study is calculated by using different methods.

8. The analysis which is concerned with the comparison between the food growth and growth of population is considered in the **eighth chapter**. In order to make a comparative study between food and population growth and associated problems with it, the growth rate of cereals and pulses have been included in the seventh chapter.

   This chapter is also associated with the analysis of availability of food in relation to population in Solapur district. By adding some criteria the per capita per day cereals and pulses have been calculated for the region as a whole and tahsil wise data have been represented through maps.

   The requirement of food for region as a whole and tahsil wise in particular has been calculated per capita per day. The demand and supply of food, the deficit and surplus regions have also been examined in this section.

   The available foods in the region and in the concerned have been converted into calories. These calories were calculated further into the availability and requirement in relation to population. The per capita per day calories deficit and surplus calories per capita per day have also been computed. On the basis of demand and supply, the deficit and the surplus regions have been demarcated.

9. The factors influencing growth of population and food production in Solapur district have been included in **chapter ninth**. The correlation matrix has also been prepared with the help of certain social, economic physical and demographic indicators. Thus, the results computed of coefficient of correlation have been interpreted. Factors influencing the demand and supply of food have been
analyzed in chapter nineth.

10. The last chapter gives the generalization of the study. The conclusions and suggestions have also been made in this section. Rapid growth in population has outstripped the locally available food and, hence, food problem has become more acute. Now-a-days in the Solapur district large number of population depends on locally produced food grain, as per the national sample survey (N.S.S.) data about 25.02 percent of the population in the district was below the poverty line. The incidence of poverty in urban areas is accounted for 26.81 percent, which is more than that of rural areas which comes to 23.72 percent of the Solapur district.

Consumption levels of food grain and required calories from the sources other than food grains depend on per capita income. According to National Sample Survey (N.S.S.), even economically developed region of Solapur district is also facing the problem of mal nutrition; all these factors have been considered in the relevant chapters of the study.
REFERENCE

