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CHAPTER – I

INTRODUCTION:

In day- today life the basic needs of man are food, clothes and shelter, out of these, food is the most significant need of man. In the absence of shelter and clothes, man can support his life for a considerable period of time, hence, it may be said that food is very essential for existence of man.

Now a days, due to improvement in the medical facilities, mortality rate has declined substantially and the birth rate more or less remained constant or declined very slowly, due to social awareness. As a result of this, the population of a country like India is increasing at a very rapid rate, resulting in a very serious and acute problem before the planners. All the efforts are being made to improve the agricultural productivity. But the growth of agricultural production is not keeping the pace with the population explosion. Since we know that the resources and means of the earth are limited and fixed and further cannot be enhanced. If it is so done, than the increase in agricultural land in particular, will be at the cost of deforestations which is not desirable at all in present situation.

In order to retain the ecological balance, any kind of development is desirable; no doubt it must be without disturbing the ecological balance. This clarity indelicates that sustainable development should be carried out in every field in general and in agriculture sector in particular. The relationship between agricultural production on the one hand and the growth and existing population on the other are the important parameters to analyze in depth to understand precisely the nature of problems of agriculture in a particular region.

Agriculture is a basic occupation and meets the primary needs of man i.e. food, clothes and shelter. It is the source of economy of a nation. It provides, the raw material to different industries. Thus, agriculture plays an
important role in the economic development of a region. In India about seventy percent of their workers are employed in agriculture. But the level of agriculture production, which depends upon the soil's fertility, and use of modern technology is very low. In underdeveloped countries, there is a negligible use of modern agricultural tools and techniques. Therefore, there is more dependence on agriculture as a source of livelihood.

Agriculture land is the most important to implement, the policies made by the Government. Its importance further increases with the increasing demand of population on land; but it is a limited resource. Its scientific utilization has become more important and it is possible only if the whole complex of agriculture is studied at the micro or meso level.

1.1 MEANING OF AGRICULTURAL GEOGRAPHY

Agriculture refers to “the science of cultivation of soil as well as growing and harvesting of crops domestication of animals and rising of livestocks. In its broadest sense the word “agriculture” includes not only the domestication of plants and animals, but also many of operations involved in marketing.

The term ‘agriculture’ comes from a Latin word ‘agriculture’ which has its origin in the word ‘ager’ meaning a ‘field’ and ‘culture’ meaning to ‘culture or cultivate. According to Wastons’ Longman modern English dictionary, the word agriculture, as the science in order to produce crops. Agriculture is different from pastoral ‘farming’ which is the practice of breeding and rearing of certain herbivorous animals. It is in such a board context that the term is used here to include both rearing of animals and rising of crops. The legends of the beginning of cultivation cover wide range of speculation, including divine teaching by the God. Many gods have been worshiped for their power over the weather and over the growth of plant and animals life. Isis in Egypt, Demeter in Greek, Ceres in Rome, Michael in
Palestine, and Varun in India are only a few examples of the gods revered by ancient people.

Agriculture implies to the ways of cultivation of crops. Etymologically the expression, Agricultural Geography” has Greek and Latin roots. The etymology and the dictionary meaning of the phase, suggest that ‘agricultural geography’ is the description of large scale soil cultivation with reference to natural environment and human circumstances.

The study of relationship between economic activities namely, the primary, secondary and tertiary and their environment was given a special little of the science of ‘genomes’ or ‘genome’ since agriculture is one of the primary economic activities, the study of relationship of agriculture with its environment may well deserve a little, the science of ‘geocultura’. The question arises whether ‘agricultural geography belongs to science field or to an art? Agriculture can be considered, a science in view of its techniques of analysis, methods of interpretation and its approaches to the investigation of agriculture. On the other hand, as a science, agricultural geography is concerned with the formulation and testing of hypothesis, interpretation of geographic distribution and location of various characteristics of agricultural activities on the surface of the earth and measurement of geographic relationship. Further more, as a science, it also seeks to identify desirable and classify the problems of agriculture against a geographical back drop.

1. According to Andreac (1981) “agricultural geography is the science of agriculturally transformed earth’s surface with all its associated physical, social and economic interrelationship as reflected spatially. The mains focus of this definition is on the point that over the period of last 10000 years, man by his deeds has transformed the natural vegetation. He has modified the natural ecosystem in to agricultural ecosystem. The agricultural geographers with the help of same indicators can divide the earth surface into different,
agricultural types or systems. Subsequently, these systems need to be
described, analyzed and explained.

2. Bernhard (1915) defines, “agricultural geography as the study of
regional variation in agriculture and the factors responsible for them.” It is a
relatively more rational definition of agricultural geography as it takes into
account the regional distribution of agricultural activities. It also attempts to
identify the physical and cultural factors which control the spatial
distribution of agricultural pursuits.

3. According to Cappack (1969), in agricultural geography “the
agricultural facts are arranged in an orderly manner. He emphasized that the
main task of an agricultural geographer is to collect data for the testing of
hypotheses and to provide adequate explanation for the spatial distribution
of agricultural activates. Coppock, in his definition, has given adequate
emphasis on the purpose of agricultural geography and the methodology to
be adopted for the formulation of agricultural models, paradigms, theories
and generalization.

4. According to Hillman (1911) “agricultural geography deals with the
comparative study of agricultural aspects of the countries and continents.
The basic focus of this delimitation is to complete the agriculture activities
of different countries and continents at a macro level. In reality the decisions
about, the cropping patterns and associated activities are taken at the field or
micro level. “Moreover, this definition does not explain the causes at such
spatial variation in agricultural phenomena.

5. According to Johnson (1985) “agricultural geography has been
defined as the study of spatial variations in agricultural activity, involving
both the description of such variation and attempts to explain them. This
definition has taken widely accepted by geographer as it describes not only
the spatial variations at agricultural phenomena but also explains the
genealogy and radio economic bases of such variations. This definition may be made clear with the help of an illustration, for example, a large number of commercial cash crops are grown in tropical subtropical regions but their cultivation and concentration depend on the geo climate requirements of the crop. Some crops such as rubber, oil-palm, cocoa, banana, coffee and spices are produced closely in the tropics, where as the cultivation of other crops such as cotton, tobacco, sugarcane, groundnut and tea intends to areas that tie in the subtropics and temperate regions. The question is why, the cultivations of these cash crops is concentrated into different climatic region. To answer the question and to explain the spatial variations of such cropping pattern is the task of agricultural geographers. Similarly, the cultivation of jute in the sub continent of India is largely confined to the plain area of west Bengal, and to a few districts of western Assam, eastern Bihar and Orissa. The demarcation of jute region, its description and explanation are to be provided by agricultural geographers.

6. Agricultural geography has also been defined as, “the science which deals with the regional or spatial variations in the distribution of agricultural entities and to explain the causes of such variations.”

Apart from the above definitions, agricultural geography has been defined as, “the science of aerial arrangement of agricultural phenomena.” In the opinion of other scientists, “agricultural geography refers to the field of study focused on the location of agricultural activities at the local, regional, national and international level.” Some scholars opine that agricultural geography is the science of relationship between the physical environment and the forms of agrarian life.

1.2 SIGNIFICANCE OF AGRICULTURAL GEOGRAPHY

Man is the central core for all the study concerned with earth as already mentioned in the definition of geography. Directly or indirectly all
the dimensions of knowledge are intimately associated for the welfare of mankind. Whereas physics, chemistry, mathematics, medical science and economics all are associated to find out and solve the problems of the man inhabited over the surface of the earth.

Land is the most significant component among the natural resources of a region. The importance of agriculture in the economic development of any country, rich or poor, is borne out by the fact that it is primary sector of the economy which provides the basic ingredients necessary for the existence of mankind. Agriculture also provides most of the raw material which, when transform into finished products serve as basic necessity of human race. In a preponderantly agrarian economy agriculture plays the most strategic rate from the several point of vinous.

In addition to supplying food, agriculture provides many raw materials for industries. Agriculture generates export surpluses in order to earn foreign exchange. Agriculture is not only a supplier of goods for domestic and export needs, but is also a supplier of production factors such as capital and labor.

The ideas, which formed the intellectual and emotional basis of agricultural fundamentalism, have deep root in human history. Because, mankind through out most of it existence has been either pastorals, nomadic or farm people earning livelihood directly from the earth.

The shift to industrialism and urban living is of recent origin, almost the current development when are considered in the correct historical perspective. Agriculture includes all plants, poultry birds and animal products for direct or indirect consumption by mankind. Apart from food, agriculture meets many other needs of man from cultivation of plants to rearing of animals. So long as the need for such supplies continues to be a problem man will continue to such information for not only how, but also
from where human requirements are to be met. Human history confirms that
the specter of starvation has been a constant threat to mankind. The
prevailing, circumstances are such that even advanced science and
technology available to man do not appear to be able to arrest the present
rate of population growth, nor the capability to produce enough food to meet
the need of increasing population, and, if the present lapsided food
population ratio continued, it would further aggravate the already worsening
food problems.

Almost all the nations of the nations at the world have embarked an
agricultural production, with accent on establishing the nature of conditions
surrounding that production in specific areas or at the conditions favorable to
instituting the same in areas not currently devoted to that purpose. Also,
many nations of the world have been acquiring precise information as to
where supplies of such agricultural products may be most effectively
obtained as can meet their ever-growing domestic needs. Such information
can be supplied by an agricultural geography which in fact highlights the
significance of agricultural geography. In the present developmental
context. To sum up, the major objective of agricultural is analysis of the
agriculturally structures and their natural, economic, and social relationships
and organizations are reflected spatilly. Such agricultural geographic studies
are necessary for any transforming activity of man, particularly for planning
and development purposes.

The significance of agricultural geography is that it provides help and
guidelines for decision-makers.

1) The agricultural specialist, who wishes to improve the structure of
agriculture,

2) The food economists, who wishes to increase the production of
foodstuffs.
3) The irrigation engineer, who plans to introduce new irrigation schemes.
4) The regional planner, who is on the lookout for the most favorable location for recreation areas.
5) The transportation engineers, who has to lay the new rail-rood lines.
6) The demographic planner, who plans public services and utilities, and numerous other specialists.

In short, it may be concluded that many dwellers in developed, developing, and other highly industrialized and urbanized countries, seldom appreciate the fundamental importance at agriculture in their lives, of course, farmers and ranchers realize its significance, but the millions of urban residents scarcely, give it a thought. They get milks from milkman meat from the butcher, vegetables, and fruit from the grocer, and bread from the baker. For them, agriculture might be an activity practiced on the earth. Only when the supplies are scarce, as during a war, then the production from the soil enter into their minds.

1. Agriculture is a source of food for human beings.
2. Agriculture is a source of raw materials for factories.
3. Agriculture is a source of animal foods.
4. Agriculture is the original occupation.

1.3 PLACE OF AGRICULTURE IN MAHARASHTRA AND MARATHWADA:

The present state of Maharashtra as the old Bombay state prior to independence is not a backward state, excepting certain areas in various corners of the state even during the British period irrigation were constructed and irrigation was the single most prime factor which completely transformed the whole landscape from a simple jowar bajara cropping area...
into an industrial crop zone i.e. Sugarcane in 1960-61 about 17.9 million hectares of land was under cultivation while in 2000-2001 it decreased to 17.82 million hectares. During the third five year plan Rs.6234 crores were spend on the development of agriculture in the state of Maharashtra. During fourth five year plan 196 crores were spend on agriculture and allied services. During the seventh five year plan about 614 crores and in eight five year plan about Rs. 1750 crores were spent on agriculture and allied services. Maharashtra government has also made remarkable agricultural progress. During 1991-2001 about 1.85 crores people were engaged in agricultural activities in Maharashtra state.

In 1961 there were 2319 tractors in Maharashtra while in 1992 the number of tractors increased to 46631 in the state. It means the number of tractors increased more than twenty times in the state of Maharashtra. During 2000-2001 about 12 lakh hectares of land was under irrigation but in 2000-2001 about 25.7 lakh hectares of land was under irrigation in the state of Maharashtra about 991 metric tonnes chemical fertilizers were used in 1960-61, whereas in 2000-2001 nearly 1327849 metric tones chemical fertilizers were used in the state. It means that use of chemical fertilizers is increased by 1339.91 times from 1960-61 to 2000-2001.

The area under total food grains increased from 129.55 lakh hectares to 137.98 lakh hectares between 1960-61 and 2000-2001 cotton area was also increased from 25 lakh hectares to 30.85 lakh hectares from 1960-61 to 2000-2001. The area under sugarcane increased by 3.09 times from 1960-61 to 2000-2001. area under oil seeds increased from 12.08 lakh hectares to 26.89 lakh hectares between 1980-81 and 2000-2001. Due to the increase in population pressure area under various crops increased to a greater extent from 1960-61 to 2000-2001. The production of total food grains increased from 77.44 lakh metric tonnes to 145.89 metric tonnes between 1960-61 and
2000-2001 cotton production was increased by 1.88 times while sugarcane production was increased by 4.9 times from 1960-61 to 2000-2001 use of chemical fertilizers high variety seeds, tractors and increase in irrigation facilities are the responsible factors for the greater of production.

As far as the development of agriculture is concerned we found that some areas are still backward in agricultural development in the state i.e. Konkan region, Kolhapur, Nasik, Pune, Sangli, Solapur, Ahmednagar district have made good progress in agriculture sectors as composed to the other districts of Maharashtra.

Marathwada region is situated at the central part of the Maharashtra state. It includes eight district and seventy four Tahsils. Agriculture forms the backbone of the regions economy nearly 70 to 75 percent population is directly engaged in agricultural activities.

Agriculture including soil conservation minor irrigation agriculture production drought area programme dairy development and power was given the top most priority in the plan because without a sub station increase in the production of food and basic raw materials for industry at would be impossible to a higher tempo of industrial development in the region. In five year plan nearly 30 percent amount was spent on agriculture and allied activities. In eight five years plan nearly 27.5 percent amount was spent on the agriculture and allied activities in the Marathwada region. At present there are seven major and 78 medium irrigation projects in Marathwada region. About 1316 minor irrigation schemes are found in this region. Most of the minor schemes becomes dry in the summer season number of tractors increased from 530 to 6084 between 1972 and 2000-2001 use of chemical fertilizer and HYV seats increased to a geter extent in the region. The production of total food grains increased form 19.02 Lakhs metric tonnes to 39.20 Lakhs metric tonnes between 1960-61 and 2000-2001 out of the total
food grains of Maharashtra about 13.16 percent production was obtained from Marathwada region about 28.91 percent total pulses production was obtained from the Marathwada region to the state in 2000-2001 it mains that Marathwada is leading in pulses production in the state of Maharashtra out of the total production of the state nearly 23.06 percent. Oil seeds production was received from the marathwada region in 2000-2001 it means that marathwada region has greater potentials for the agricultural development.

1.4 THE CHOICE OF THE TOPIC

Among the various problems, the agriculture problem stands, perhaps, at the first rank, since, India is an agricultural country, where about two third population of the total is still engaged in the agricultural sector. Agriculture is the main source of economy in India; the sizable proportion derived their livelihood from agriculture itself, even today, many studies pertaining to agriculture have been carried out at National and International levels. No doubt, such studies furnish the basis and fundamentals information, which give generalization of the problems and their magnitude at local or regional levels, which enable us to understand their problems very clearly.

In view of the proceeding discussion, it is most appropriate to undertake a study pertaining to agricultural problems in developing regions like India. The selection of the topic is not very arbitrary, since no study of the topic entitled “Geographical Analysis of the problems and Prospects of Agriculture in Beed District” has been undertaken for study.

1.5 THE CHOICE OF THE REGION

India is a predominantly agricultural country. Maharashtra in India occupies a very important position which ranks third in area and second in population. Within the state of Maharashtra the Beed district has also a very
significant position as regards to area and population. The Beed district contributes a considerable share of agricultural production, as far as the state’s economy is concerned.

The choice of the region and topic under investigation has been influenced by several conditions. Beed District comprising eleven talukas namely Beed, Ashti, Patoda, Shirur Kasar, Georai, Majalgaon, Wadawani, Kaij Dharur, Parali and Ambajogai of Maharashtra state, has a significant location on central part of plateau of Maharashtra, it is regarded as one of the developing agricultural area of the state.

The economy of the study region is essentially oriented to the Godawari and Sindphana River and it is has made developments in agro-industrial production. With the growth of sugar factories during the last few decades the use of agricultural land is changing.

It is felt that study of particular crop cultivation offers a helpful approach obtaining a more complete understanding of the problem of agriculture related to that particular crop. More over, the composite circumstances that contribute to the existing problems facing agricultural activities today have a time and appreciated space perspective that may be appreciated. All this conditions motivates the researcher to turn his attention to this region and this problem.

Beed district has different regions at the different levels of economy.. It has different social and economic groups within the region. In view of this, the study of Beed district has been undertaken for the research purpose.

1.6 HYPOTHESES

Hypotheses in fact, are the basis of any research. These are facts and realities which exist in the region. Hypotheses are the pre-supposition on which entire research 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 following are certain hypotheses, which have been formulated for present study.

1) Beed district is agriculturally one of the most backward regions of Maharashtra
2) The proportion of the agricultural land in relation to total geographical area in the district of Beed is relatively high.
3) The proportion of the irrigated land to cultivable land is also sizable in the region under study.
4) The food crops and cash crops play a very important role towards the economy of the region.
5) The per capita agricultural production is still low in the regions
6) Due to the use of chemical fertilizers, herbicides insecticides and pesticides the quality of land fertility is adversely affected.
7) The demand and supply of the agricultural production is not fulfilled by the region itself.
8) The implementation of modern technology is still very poor in Beed district.

1.7 OBJECTIVES-

Without Objectives, no study can be fulfilled and completed. As a matter of fact, the chief purpose of research is to obtain, the result by fulfilling its objectives. Each and every study is carried out on the basis of certain hypotheses and objectives. In fact, the objectives are the goals to obtain by the researcher. Study entitled “Geographical analysis of the problems and prospects of agriculture in Beed district” has the following objectives to fulfill.

1) To find out the proportions of the agricultural land to total geographical land.
2) To study the availability of infrastructural and geographical factors on which the development and growth of agriculture depend.
3) To find out the general and agricultural land use and its variation in the region.
4) To find out the proportion of various land under different crops.
5) To analyze the cropping pattern in the region under study.
6) To find out the agricultural production of different crops.
7) To assess the trends of production and yield in the study region.
8) To find out the impact of inputs and mechanization on agricultural sector
9) To study land use and cropping of selected villages and mark out the agriculture region of the study area.
10) To draw conclusion, and find out the agricultural problem and suggest suitable remedies to solve them.

1.8 SOURCES OF DATA

The information and data are the most vital requirement for research, without proper information and data, research cannot be carried out. No desirable conclusion and generalization may be obtained without proper data analysis. Hence, the data, which is basic, tools of research; has been collected from different sources such as published and unpublished works.

Season and crop reports published by the government of Maharashtra formed a major source of data on land use and cropping pattern at district level.

Annual socio-economic review and district statistical abstracts of Beed district have been the sources for the data on land use, cropping pattern, irrigation and other economic activities at taluka level.
1.9 METHODOLOGY

Thus, the data collected from the different sources have been processed and the proportions and percentages have been calculated. The processed data has been tabulated and certain cartographic techniques have been applied to represent the data as per requirements. Choropleth maps are prepared. Some data has been represented through graphs, charts and bar graphs. The represented data is interpreted and analyzed to find out the result and conclusions and finally to suggest suitable remedies to solve them. At the end of each chapter, the relevant references are given.

1.10 REVIEW OF LITERATURE

1. T. Penchalaish and Y.V. Ramanaih 1992 - have studied the spatial analysis of rainfall in the drought prone area of Cuddapah district, Andhra Pradesh. In this study, an attempt is made to describe the spatial distribution of rainfall, rainfall intensity, rainfall ratio, rainfall variability and rainfall frequency in Cuddapah district on seasonal and annual basis. Rainfall from 1901 to 1988 was taken for nine rain gauge station for analysis.

They have found out that the decadal variation in rainfall intensity showed an increasing trend during 1910, 1920, 1940, 1950 and 1960. During southwest 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 co-efficient of variation of rainfall during winter period has shown higher variability values in the decades of 1910 and 1950. They have found that the values of Co-efficient of variability of rainfall were comparatively low during summer period. Low rainfall ratio was noticed during the period 1920, 1930 and 1940. Moderate rainfall ratio values were found during 1950, 1970 while in 1980 the ratio values were high.
2. Sonwane B.G. (1998) - have studied, “agricultural transformation in Nanded district of Maharashtra state”. The entire work is divided into eight chapters. In first chapter, he has thrown 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 determinate of agriculture. Fourth chapter throws light on general land use; where as fifth chapter explains agriculture cropping pattern in the study region. Sixth chapter deals with production and productivity of the various crops while seventh chapter throws light on case study of selected villages. In the last chapter author has drawn some conclusions 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 1991-1992, for the study of population characteristics, author has calculated various densities such as caloric density, nutritional densities, 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, their production and productivity. He used Weaver’s and Doi’s methods for the calculation of crop combination.

They 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. He also found that there is transformation of agriculture from food crops to cash crops in the study region.

3. Nandani Chatterjee (1995) - She has studied “irrigated agriculture: A case study of west Bengal”. She has collected official as well as field survey data. The main objectives of the studies are: To highlight the basic problems that have made irrigation a necessity. 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. 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.

She 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 yield have been depicted by the pearson’s correlation co-efficient. She used Wilconxon ranked pair test to test the significance of change between 1960 to 1980. She has not Only carried out a comprehensive study of the irrigated forming now practiced in west Bengal but also under taken an in depth analysis of irrigated agriculture in selected village 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.

She found out that irrigation potential of west Bengal was not fully utilized. During the period of investigation only thirty six percent of gross cropped area was availing irrigation facilities. She has pointed out that the growth rate of irrigation during the period of 1995-96 was somewhat sluggish.

4. Dr. T.C. Sharma and Dr. G.S. Badiger (2003) - They have studied recent trend in crop production in Karnataka a post facto enquiry. The present enquiry analysis in growth position in the production of principal crops growth in the state of Karnataka for the 1966-90 periods with a view to clearly justifying the crop with a lower growth and the probable causes there in. The study is purely empirical in nature, its results based on the volume of change in production between 1966-69 and 1989-90, its decomposition into yield and area components compound growth rates for the 1966-90, 1980-90 period, and co-efficient variation for 1966-90.
Geographical investigation of the agricultural phenomena pertaining to this district is very less. A detailed work based on taluka level data showing the agricultural pattern and changes therein has not been previously done. However, present study is an attempt in that direction.

5. Majid Hussain (1969): He has studied the geographical basis of tube well irrigation in the upper Ganga Yamuna doab. In this paper the geographical factors are helpful in the drilling of tube wells in the area have been assessed and the effect of tubewell irrigation on the changes in the landuse pattern have been shown. The paper includes four maps, showing the surface configuration of the area and the area under commands of canals and tube wells. The proportion of the cropped land irrigated by tube wells also have been depicted in a map. The study can be utilized for the further extension of canals and small irrigation projects in the area.

6. Ali Mohammed (1975): He has studied agricultural landuse and nutrition in Kheri, Sitapur and Barabanki district (U.P.). The entire study is divided into four sections, consisting of fourteen chapters. In the first part researcher has endeavoured to make a comprehensive study of the natural environment (physiography, climate and soil) of the region with a view bringing out the extent of influence of these factors on the existing crop landuse. A study has also been made on spatial patterns of general landuse, agricultural landuse and crop combination regions. The principles of the selection of villages for intensive study of landuse and pressure of population have been logically discussed in one chapter. The entire area has been divided into five hugenous strata and representative villages have been selected from each stratum on the basis of the systematic purposive cluster sampling. Part Second which is entirely based on fieldwork includes the study of land utilization and pressure of population in the twelve selected villages of the region. A certain classification about the selected villages has
been studied. A detailed account of the casting landuse and the selected villages of each stratum as well as amount of caloric intake per head per day obtained as the basis of cropped area, yield of crops and the total number of persons dependent on the village produce. Potential production units calculated on the basis of land productivity have also been given in each village, which show the extent of agricultural development as attained by the present method of technological advancement. The third part deals with the supply of various elements of diet to the village people, the deficiently of surplus of these elements and the resulting nutritional deficiency diseases. The work provides a few suggestions for the future development of agriculture and standard of living in the region as in all the villages unbalances nutritic has played an adverse role to bring about numerous lacunain the rural population.

7. **Vats P.C. (1977)**: Examined influence of macro geomorphological units on landuse and crop - production, a case study of village Dundi. The study was conducted with the help of aerial photographs of 1: 25000 scale toposheet of 1/63, 360 scales and by the subsequent detailed field surveys. The land utilization data and the village maps were collected from the revenue records. A number of soil samples from each geomorphic unit were collected and analysed to determine the physical potentialities and limitations each units. Relationship between landforms and landuse has also been established.

On the basis of field survey, it was concluded that geomorphology which control the distribution of soils, surface and surface water, vegetation and cropping pattern has influenced the crop production. Author found that crop production of village was very low during the period of investigation. The major factors which limit the agricultural productivity were shallow
soil, saline soil, presence of carbonate, shallow granite rock (weathered at top), mineralized ground water, with erosional and depositional hazards.

8. Das M.M. (1981): Studied “landuse pattern in Assam”. The objectives of the paper were (1) to analyse the landuse pattern in Assam for 1965-1974 period (2) to analyse the spatial variation of landuse at the district level in 1973-74. (3) To analyses the volume of change in landuse in different districts of Assam during 1969-1974 by the Weaver's index and to identify the regions of dynamic, semi - dynamic and static landuse pattern.

In order to achieve above objectives the research was postulated two hypotheses i.e. (1). The scope for physical expansion of areable land is very much limited in Assam. (2) Areas with best soil are dynamic in respect of landuse changes, while those with poor continue to be static.

For the study author has collected landuse data from the official records and Government publications. In order to demonstrate the spatio-temporal pattern of landuse, two maps were prepared for 1969-70 and the other for 1973-74. In the second stage, Weaver's index was used to find out the volume of landuse change. The districtiwise indices were classified into three categories i.e. dynamic, semi-dynamic and static and were presented in choropleth maps. Author found that a large proportion of the geographical area of Assam is not suitable for agriculture. Whatever land is available for cultivation has already been brought under the plough. Extensive areas of the two hilly districts are not suitable for cultivation due to unfavourable terrain character. Numerous rivers with their ever shifting courses, a bids, swamps, deep forests and scattered hillocis have rendered a large proportion of land in the plain districts unsuitable for growing crops. The first hypothesis was proved, therefore, intensification be laid increase the productivity of the existing cultivable area in the coming decades.
9. **V.S. Datye and S.C. Gupte (1984)**: has studied association between agricultural land use and physio-socio-economic phenomena: A multivariate approach. In this paper an attempt is made to explain how and to what extent do the factors of physio-socio-economic environment influence the agricultural land use types on one hand and physio-cultural elements on the others hand. The fourteen variables like net sown area, gross cropped area, rice, jowar, cash crops, irrigated area accessibility, owner cultivators, density of population, slope less than 30, slope greater than 200, distance from crest, distance from major streams were used as dependent and independent variables. First seven variables were used as dependent and next seven variables used as independent variables.

The relationships were studied and analysed by applying quantitative techniques like simple correlation, multiple regression and principal component analysis. The results of the correlation analysis and multiple regressions bring out the importance of the factors of physical environment which have a strong influence on the land use. The principle component analysis also has brought out these relationship more clearly defining seven dimensions of land use and has further provided a comparatively deeper appreciation of the variation in regional characteristics. In fact, mapping of the component scores for three components have very clearly brought out the validity of the regional frame developed on the basis of relief and rainfall variations.

10. **K.S. Bhaskar, Shanial, O. Challa and S.H. Madavi (1987)**: They have studied agricultural efficiency of Vidharbha region (Maharashtra). The main objective of the study was to assess the agricultural efficiency of the Vidarbha region comprising of Buldhana, Akola, Amravati, Yavatmal, Wardha, Nagpur, Bhandara and Chandrapur (including Gadchiroli) districts of Vidarbha for 15 crops.
Agricultural efficiency out fifteen crops viz. pearl millet, maize, pigeonpea, chickpea, wheat, sorghum, barely, blackgram, green gram, cotton, groundnut, finger millets, sunflower and safflower grown in Vidarbha region has been worked out. The following formula was used to calculate agricultural efficiency.

\[
A. E. = \frac{D_1 (x_1 + x_2 + \cdots + x_3)}{R (x_1 + x_2 + \cdots + x_3)} \times 100
\]

Where, \(D_1\) is yield in particular district,
\(x_1, x_2, x_3\) are crops grown in the region and
\(R\) is regional total yield of all the crops.

11. Jagdish C. Kuniyal (1987): has studied crop concentration and diversification in Nainital district, U.P. Himalaya. Author has defined the meaning of crop concentration and diversification. Author has used Bhatia's formula for the crop concentration. He has used Jasbir Singh's formula for the crop diversification. Paddy, wheat, maize, pulse, oil seeds, Sugarcane, barely and potato these crops are considered for crop concentration by the author.

Author found areas of very high and high rice and sugarcane concentration lying in the patheer of Tarajract. The concentration of rice, pulses and oil seeds in hilly tract was almost negligible (i.e. in low and very low categories). These crops require large amount of rainfall and water supply. Author concludes that cropping system in the region is primarily dependent upon physical factors and secondarily upon socio-economic conditions.

Author found very high crop diversification in Okhalkanda, Dhari, Kotabagh blocks while high diversification of crop was observed in Ramgrah, Bhimatal, Haldwani, Ramnagar and Bazpur blocks. He found low
diversification of crop sin Sitrganj, Kashipur, Gadarpur and Betalghat blocks during his study. To get good returns and to maintain crops ecology, hilly farmers should be encouraged by giving priority to the development of horticulture, vegetables and edible and medical plants in place of crops farming. This will inevitably maintain eco-restoration and crop ecology and the goal of achieving self sufficiency in food grains without imbalancing the eco-system of the region may be lagely achieved through the policy of diversification of crops in place of mono-cultural activities.

12. Sharma S.K. and Jain Ajitkumar (1988) : They have examined diffusion of innovations in the cotton growing tract of Madhya Pradesh: A case study of pestiticide. The study was based on farm survey of four district viz. Khargone, Khandwa, and Ratlam of the western Madhya Pradesh. The study of diffusion of innvotions was entirely based on the first hand information collected throught the structural questionnaire and interview method. Unlike pesticides were sold in towns only twenty seven villages were selected for the study.

This survey of cotton growers of the western Madhya Pradesh shows that the knowledge of agricultural innovations had percolated to them. But the channels of arrival of this knowledge and the extent of its utilization vary widely. The size of land holdings has been major determinants.Author found that the improved seeds were brought to the farmers by Government department and also by co-operative societies. But the case of pesticides was quite different. Dealers of these chemical had came forward as major source of knowledge.

13. R. B. Mandal (1969): Has studied and elaborated the weaver's method in analyzing crop combination regions with special reference to North Bihar. He has studied various crops of North Bihar. He used weaver's
crop combination method with modification for the study of crop combination region of North Bihar.

1.11 ORGANIZATION OF THE WORK:

In order to understand the nature and the tempo of problems in the region step by step, the research work has been divided into following chapters.

I) INTRODUCTION -

The first chapter deals with the introduction of the topic in which the justification of the topic and the region to be undertaken has been considered. The hypotheses, objectives, the sources of data and information as well as methodology have been discussed. The organization of the work has been taken into consideration also in this chapter.

II) PHYSICAL AND HISTORICAL BACKGROUND OF THE REGION -

The second chapter throws light on physical factor like location, boundaries and extension of the area, physiography, geology, drainage pattern, climate, soil and natural vegetation. Historical backgrounds has also discussed in the second chapter.

III) NON-PHYSICAL DETERMINANTS OF AGRICULTURE IN BEED DISTRICT

The third chapter deals with demographic factors, population, literacy, irrigation, marketing, transportation and communication have been discussed.

IV) GENERAL LANDUSE PATTERN IN BEED DISTRICT -

The fourth chapter is related to the general land use pattern. It includes the consideration of classification of the land.
V) AGRICULTURAL LAND USE PATTERN IN BEED DISTRICT-

The fifth chapter is associated with the agricultural land use pattern in Beed district. In this chapter an attempt is made to study the tahsilwise trends in area under different crops, crop combination, crop concentration and crop diversification etc.

VI) AGRICULTURE YIELD AND PRODUCTIVITY-

The sixth chapter throws light on growth of production in the region, tahasilwise trends of production and yield, variability, yield trends of selected crops, and also factors associated with agricultural productivity of principal crops has been studied in the sixth chapter.

VII) CASE STUDIES FOR MICRO-LEVEL ANALYSIS OF SELECTED VILLAGES-

Certain villages have been selected for the case study to find out the problems associated with the agriculture and recommendations for the planning have been derived out through first hand information.

VIII) CO-RELATION MATRIX OF THE VARIABLES INFLUENCING AGRICULTURAL PRODUCTIVITY IN BEED DISTRICT-

In order to establish relationship between physical, social, economic and demographic factors on the one hand and agricultural production on the other has been taken into account in the eighth chapter. The correlation matrix has been prepared and co-efficient of co-relation are interpreted.

IX) CONCLUSIONS, PROBLEMS AND SUGGESTIONS -

The last chapter gives certain generalizations and conclusions of the research work done in all concerned topics and agricultural problems of the study region. It also suggests some recommendations to implement for the planning purpose for the improvement of the Beed district.
REFERENCES


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