CHAPTER 1

Introduction to the Study Region
CHAPTER-1
Introduction to Study Region

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Chapter-I

Introduction to the Study Region.

1.1 Introduction

Geography concerned with spatial distribution of various characteristics on the earth surface. Geography involves such a wide range of knowledge the subject has been divided in two major and many sub area of study. Agricultural geography is one of the important branch of geography. Agriculture is one of the primary as well as basic economic activity. Agriculture is the science and art of cultivating soil, growing and harvesting of crops, domestication of animal and raising of plants for the use of human being.

Agricultural is more diverse than any other human activity. It is not only because most of the people depends for food and several raw materials on it but also because largest fraction of land under human occupancy is used for agriculture purpose. It is still largely depend on environmental conditions and present wide spatial variation. Though significance of agriculture in terms of employment and generation of national income are still important, the development of agriculture is an essential, for sufficient conditions of rural development. Its development win strength the rate of industrial development by increasing food production capacity.

The traditional methods of cultivation continued to dominate the since till we achieved independence. The agriculture continued in this country more as a way of life than as an occupation. The knowledge of cultivation transfers from one generation to another. As such for a very longer period there was absolutely no change either in the methods of cultivation or in the cropping system. We learn from the various accounts
cultivation or in the cropping system. We learn from the various accounts that heighten there was change in the occupation nor there were many active agents, which could induce change.

Only after achieving independence, the government and the people could think of improving the lot of agriculture in planned way, large number of experiments were continued, which were responsible for gradual change in agriculture. Agriculture land use in study area recorded continuous changes from last few decades. In 1980-81 the study area has 28.05% hectares of its area under cultivation, which raises to 33.6% hectares in 2001-02. The net area sown during the span of twenty-five years, was due to the reduction of culturable waste land, as much as possible potential land of study brought under plough. The agriculture is the study area has been undergoing a transformation since the introduction of the new agricultural technology. Extension of irrigation, introduction of improved and high yield seeds in selected crops, use of chemical fertilizer and mechanization of farming brought these changes. A change in agricultural land use implies a change in proportion of area, under different crops at two different times. Change in cropping pattern indicate that change in socio-economic status of farmers (Pawar 1982). There is considerable change in pattern of agricultural land use during last two decades.

1.2 Meaning of Agricultural Geography

Agricultural geography is a scientific study of the spatial pattern of agricultural activities in dimensions of time and space. It involves organization of soil resources in interaction with climatic, biotic and human factors. The change in resource use technology, scientific knowledge, social institutions and human aspirations have been reflected in the use of land resources.
The term 'agriculture' is derived from the Latin word 'AGERCULTURA' which literally means 'care of soil' 'Geography' in its Greek derivations denotes a discussion of the earth. Thus, agricultural geography is the discussion of the cultivation of field on the earth surface. The evolution of occupational pattern of mankind has passed through successive stages of development. In recent years, it has made considerable progress towards maturing as agricultural geographers have began to treat data.

According to Bernhard, H(1945) : Agricultural geography strives to bring light to spatial variations in agriculture and reasons for them. It is relative more rational definition of agricultural geography as it take into account the regional distribution of agricultural activities. It also try to find out the physical and cultural factors, which put limit on the spatial distribution of agricultural pursuits.

Morgan, W.B. and R.J.C. Munton (1971) : A scientific agricultural geography is not concerned simple with describe the nature of farming in particular places, but to understand the spatial aspects of the farm enterprises, i.e. crops and livestock, whether considered individually or in groups and farm operations.

Singh, Jasbir and S.S. Dhillon (1981) : Assurance, agricultural geography is concerned with the formulation and testing of hypothesis, interpretation of spatial distribution and location of various characteristics of agricultural activities on the surface of the earth and measurement of geographic relationship. Further, as a science, it also seeks to identify, describe and classify the problems of agriculture against geographical back drop.
According to Zimmerman (1951), agriculture would mean the cultivation of land. But agriculture includes for more than this. It also includes animal husbandry, tree culture, forestry and many other varied activities.

The opinion of Andreae (1981): The science of the agriculturally transformed each surface, with all its associated natural, economic and social inter-re-habitation-ships as reflected spatially.

Hillman (1911): He had defined as the agricultural geography, deals with a comparative study of agriculture of country and countries. The basic focus of this definition is to compare the agricultural activities of different countries and continents at a macro level. In reality the decision about the cropping patterns and associated activities are taken at the field or micro level. More over, this definition does not explain the causes of such spatial variations in agricultural phenomenon.

1.3 Nature of the Geography of Agriculture

Agriculture geography as an interdisciplinary field (Morgan, W.B. and R.J.C. Munton, 1971) with stronger inputs from economists and soil scientists. Even though agricultural and geographical relationships constitute a single spatial phenomenon. Agricultural geography is concerned with the crops and livestock enterprises and farm operations along with exchange trade and marketing of the agriculture, products. The main focus of interest in the progressive scale of the aerial units are the field, the farm, the nation and the universe. It is farm of field systems, cultivation cycles and operational enterprises whose end product is agricultural produce. The farm is a larger unit, where locational factors, land quality and systems of operation become acute important.

Geography and economics have similar fundamental concepts. The study of agricultural commodity depends on soil fertility, climatic
suitability etc. Its value can be increased by the method of production, transport, market and efficiency of exchange. The real gain of farmers are land, labour, financial resources, seed, fertilizer, pesticides, cost of irrigation etc. The scarcity of resources makes the best use of their land at proper season. Agriculture is the pivot of an economic activities. Agriculture is the major source of raw materials for manufacturing and a major commodity for retail activities. Only those areas of the world human population spread where agriculture was possible. Physical and cultural factors are reflected on agricultural production. Agriculture is not entirely determined by terrain, soil, climate. The limitation of these factors can be modified through irrigation, temperature control, fertilizer and adoption of new techniques in crop like stock combination finally the accessibility to make control the price level.

1.4 Significance of Agricultural Geography.

The spatial variation of agricultural phenomenon is the main focus of agricultural geography. To investigate the spatio-temporal variability of agricultural activity is main trust of geographers in the modern agricultural geography. Agriculture regionalization is done by crop combination, crop concentration, crop diversification, agricultural efficiency, land use survey and land carrying capacity region.

In the study of land use other farming variables like land tenure, field size, size of holdings and labour supply must be taken into consideration along with physical variables for instance terrain, temperature, moisture, soil etc. and economic variable viz. irrigation fertilizer, technology etc.
In short in the comprehensive study of agricultural geography physical, social, economic, cultural and infrastructural variables has to be consider, on which unified approach is based. It is essential to study the agricultural land use in connection with geographical and man made factor.

Agricultural studies the geographical activities of man and his economic action for the fulfillment of the needs As the result of the diverse circumstance of atmosphere in the various area of the earth. Agricultural system and production play vital role in economic progress. The mutual study of the agricultural life as a result of these similar and dissimilar circumstances is made under agricultural geography.

The main objectives of the study agricultural geography are-

i. To delimit the areas of agricultural stagnation, transition and dynamism.

ii. To demarcate the crop production regions or crop combination regions or agricultural enterprise regions.

iii. To highlight in what direction and in what volume the changes in agriculture are taking place.

iv. To identified weaker area in terms of agricultural productivity.

v. To analyse the operation of farming system and the changes they undergo

vi. To explain how different kinds of agricultural area distributed over the earth and how they function in spatial arrangements.

vii. To understand how particular types of agriculture have developed in particular areas and how they are similar to or different from farming in other areas.

All these fall within the scope of agricultural geography.
In agricultural geography focus the study of three basic sets of relationship, viz.

i. Those between physical environment and agricultural operations.

ii. Relationship between population distribution, density or characteristics and the available agricultural space

iii. It highlight relationship between the socio-economic or cultural ecology and agricultural land use and productivity patterns.

The study of agricultural geography is considered to accomplishment mans irresistible desire to know, understand and investigate the arrangement and distribution of agricultural phenomenon at spatio-temporal scale. Moreover, the emergence of agricultural geography as an independent, distinct and a leading branch of modern geography is becoming a pivotal events in agricultural land use planning and development.

The significance of agricultural geography is that......

a] It provides help and guidelines for decision maker and useful for. The agricultural specialist, who wishes to improve the structure of agriculture, the food economist who wishes to increase the production of foodstuff.

b] The irrigation engineer, who plans to introduce new irrigation schemes.

c] The regional planner, who is on the look out for the most favourable location for recreation areas.
d] The transportation engineer, who has to lay the new rail-road lines.

e] The demographic planner, who plans public services and utilities and numerous other specialist.

1.5 The Role Agriculture in Indian Economy.

Agriculture has a vital role in the Indian economy, because it contributing nearly 36.86% of the national income, out of total working population in country. Approximately 70% workers engaged in agricultural activity. Agriculture provides the food grain more than 102 crore population, fodder for cattle population and raw material to industries. Thus the very economic structure of Indian rests upon agriculture.

At the time of independence, agricultural productivity per hectare and per worker was very low. The share of agriculture in the national income was placed at 49% in 1948-49 and it declined upto 22.1% in 2002-03. This is happen mainly because of the share of manufacturing and service sectors are increasing. It should only happen in developing country. Comparison can be made between the position of agriculture in developing countries and developed countries as regards the share of agricultural in nation income for instant. In the U.K. agriculture contributes only 2 %, U.S.A 3%, Canada 4% of the nation income and so on. In short more developed country, the smaller is the share of agriculture in national out put. But still in India agricultural sector has dominant share in the national income. Data regards the percentage of people depends on agriculture in some developed, developing and under developed countries.
It is noticed that in developed countries like U.S.A. 9%, U.K. 6%, France 7%, Australia 6%. In developing and backward countries that the working population engaged in agriculture is quite high viz. in Egypt 73%, China 93%, Nepal 92% India 72%, Vietnam 67%.

Agriculture can contribute substantially to improvement rural as well as over all economy. Thus agriculture has the more dynamic role in the development of county.

1.6. Hypothesis

The three general assumptions, which this inquiry follows-

1. Relief, climate and soil are broad limit to the use of land, physical and cultural factors may play an important role in making the change in agricultural land use.

2. There are spatio-temporal changes in agricultural land use and area, yield and production of crops in study area.

3. The physiographic controlled and input differential are responsible for the growth disparity i.e. on land that the land use patterns are controlled by the relief of the region, scarcity of irrigation is mainly responsible for a large area being put under fallow lands that lack of irrigation is also responsible for low cropping intensity in Raigad district. The cropping pattern in the study area controlled by terrain, rainfall and irrigation, in irrigated areas greater inter-crop shifts have taken place.
1.7. Study Area

The district Raigad is a part of west coast of Arabian Sea. It has approximately 240 kms. coast in west. The district is rich in natural resources. The geographical location is $17^\circ 51'$ N. to $19^\circ 8'$ N. latitude and longitudinal extension is $72^\circ 51'$ east to $73^\circ 40'$ east, with the total geographical area 7148 hectares. Total population was 22.07 lakhs (2001 census) among this male population on was 11.77 lakhs and female 10.90 lakhs. The proportion of cultivators to total workers was 28.6% (2001) in which 21.8% male and 40.9% female although the proportion agriculture labour total workers was 20.4% (2001 census). Raigad district comprises Alibag, Pen, Murud, Roha, Panvel, Uran, Karjat, Khalapur, Mahgaon, Sudhagadh, Tola, Mahad, Masala, Shrivardhan and Poladpur. Total number of villages were 1919 (2001 census).

1.8. The Approach

Agricultural geography as it stands today is one of the recent branch of economic geography. In the late twenties reorganization and regional description were its common themes, studies in agriculture are not the exclusive concern of geographers, but economists, agricultural scientists and other scholars too study agriculture. The approach of each of them however, is different. An economist confines himself to the study of production, consumption and distribution of agricultural commodities and prescribes the means of maximizing profits with given inputs. An agricultural scientists studies various aspects of agriculture, such as agronomy, plant pathology, entomology etc. A historian concentrates upon the development of agricultural through time.
But an agricultural geographer is always concerned with the study of spatial variations in agricultural phenomenon. Even when he has to study the temporal trends in agriculture he does so, through the element of space.

The agricultural geographers focus is mainly chronological rather than chorological. The theoretical and methodological base attained stability and cerographical and numerical precisions became indispensable tools to geographers. B.B. Singh (1981) presented seven fundamental concepts of agricultural geography.

1. The concept of agricultural landscape
2. Dynamic nature of agricultural phenomena.
3. Agricultural landscape as function of resource structure, process and stage.
4. Location of agricultural activities.
5. Agricultural region and aerial differentiation.
6. Inter region equilibrium and spatial functional interaction.
7. Regional agricultural development and planning.

1.9. Objectives

Following objectives have been put forth the present investigation.

1. Investigate the areal variations in the changes in agricultural land-use in the Raigad district during 1980-81 to 2004-05.
2. To analyze spatial pattern in agricultural land-use at the end of the investigation (in 2004-05).
3. To assess the effect of use of high yielding variety seeds, mechanical inputs on agriculture.
4. To examine the co-relation between agriculture land use and physical factors in study area.
5. To analyze and map the spatio-temporal distribution of irrigation facilities and its effects on cropping patterns.
6. To study the population, characteristics and its effects on agricultural land use.
7. To find out agricultural productivity and its variations.
8. To focus general land use cropping pattern in selected villages and mark out the agricultural land use at micro-level.
9. Evolution of the changes in area and yield of crops so as to explain the trend of efficiency.
10. To draw conclusion and find out the agricultural problems and suggest suitable remedies to solve them.

1.10. Data base and Methodology

Data Base

The present study realizes upon primary and secondary data, concerning irrigation, land use and cropping pattern and collected data used for the period 1980-81, 2004-05 census. The primary data collected through different sources for which special questionnaires were designed. Information were collected through various talathi offices, farmers and agricultural officers.

The broad picture of present pattern of agricultural land use of the study are is prepared with the help of secondary data obtained from official statistics such as Socio-Economic Review and District Statistical Abstract of Raigad District. Epitome of Agriculture Part-I, District-Wise General Statistical Information of Agricultural Department (Part-III Epitome of Agriculture in Maharashtra) Commissioner of Agriculture Pune, Seasonal and Crop Reports, Statistical Abstract of State.
Report on Agricultural Census Maharashtra State Part-I and II Gazetteer of Raigad District. data regarding population obtained from District Census hand-book of Raigad district. Data concerning surface water is obtained from Irrigation department, Commission Report Vol.II and III. Data regarding ground water is obtained from Senior Geologist Ground Water Survey and Development Agency Br. Alibag and Bhujal Bhavan Maharashtra State Pune-5. Data regarding soil is obtained from District Soil Survey and Soil Testing laboratory, data about climatic elements has been extracted from the publication of the meteorological department of Pune. Data regarding irrigation schemes is obtained Z.P. Office at Alibag and various irrigation departments of Maharashtra.

Specific data regarding agricultural input for instance H.Y.V. consumption of pesticides, fertilizers etc. are not available at tahsil level. Information pertaining to these aspects has been collected through questionnaires, personal interviews and visit to tahsil and district head quarter in the study area. It is considered necessary to supplement information by in depth micro-studies at village level for these purpose six villages are chosen by random sample. A micro-level study involves plot to plot survey of agricultural land and information relevant aspect like as cropping pattern, land use, number of wells, agricultural implements, consumption of fertilizer etc. are obtained with the help of questionnaires

**Methodology**

In the present study the data collected from different sources are processed and analyses in form of maps and diagrams and also used effective analysis of the relevant. Statistical information, pertaining to agricultural aspect, of district concern for measuring the pressure of
population on agricultural land, agricultural density, caloric and nutrition densities are calculated. The densities are computed by using variable like area and population.

For studying the changes in land-use pattern between 1980-81 to 2004-05 is measured by a simple method of Jasbir Singh (1974) as per this method, in a given area unit the summation of positive changes in land use types on one side and the summation of negative changes in land use types on the other side, would certainly given equal value and which is the degree of dynamic or stable in the dynamic nature of physico-socio-economic environments.

For the study the degree of dynamism in land use the index of total volume of change is calculated by using following formula.

\[ \frac{F + B + C + A}{O} \]

*The index of total volume of change = \[ \frac{F + B + C + A}{O} \]*

Where,

A = Agricultural land
B = Forest
C = Fallow land
F = Non-cultivable land
O = Other uncultivated land

Above letters have been grouped in a combination formula, where letters present the land use type and figures show their role and rank.

Weaver's method, Rafiullahas method are used for delimitation of crop combination in the study region.
Bhatia's method has been used for the computation of index of crop concentration.

\[
\text{Index for determining} \quad \frac{\text{Area of the crop 'a' in the component areal unit}}{\text{Area of crop 'a' in the entire region}}
\]

\[
\text{Concentration of crop} \quad \frac{\text{Area of all crops in the component area unit}}{\text{Area of all crops in the entire region}}
\]

In order to assess agricultural productivity, Jasbir Singh's method (1972) of crop concentration indices ranking co-efficient have been employed.

The statistical producer of this method is as follows.....

i] \textbf{Crop Yield Index}

\[
Y_i = \frac{Y_a}{Y_r} \times 100
\]

Where,

\[Y_i = \text{Crop yield Index}\]
\[Y_a = \text{The average yield per hectare of crop 'a' in zone}\]
\[Y_r = \text{The average yield per hectare of crop 'a' in the region.}\]

ii] \textbf{Crop Concentration Index}

\[
C_i = \frac{A_{au}}{C_{u}} + \frac{T_{ar}}{C_{r}} \times 100
\]

Where,

\[C_i = \text{Crop concentration Index}\]
\[A_{au} = \text{Area under 'a' crop in a zone}\]
\[C_{u} = \text{Total cropped area in a zone}\]
\[T_{ar} = \text{Area under 'a' crop in the region.}\]
\[C_{r} = \text{Total cropped area in region.}\]
iii] **Ranking Co-efficient**

The derived crop yields and crop concentration indices for the crop are ranked separately. Yield and concentration ranks for individual crops are added and thereafter divided by two, thus giving the crop yield and concentration indices ranking co-efficient.

The equation is as follows-

\[
\text{crop yield and concentration indices} = \frac{\text{crop yield index}}{\text{ranking co-efficient for the crop 'a'}} + \frac{\text{crop concentration index ranking 'a'}}{2}
\]

1. **L.D.Stamp**: For most perhaps is useful work carried out in Britain under the direction of Prof.L.D.Stamp. The survey undoubtedly played an important role in the scientific planning of land-use and provided in base for increasing Britain's food production substantially. The aim of the survey was to record the existing use of every area of land on the British ordnance survey on a scale 1:10560, which shows field boundaries and other features in detail. The technique of survey was to make a systematic record of land-use by place in the appropriate letter in its relevant places of the map after recording the map were reduced to a scale of 1:63,360 and suitable colours were also assigned to different features. Much of the field works was done along number of helpers from colleges and universities. The land survey of Britain may be considered as unique and fundamental.
2. **Prof. J.Kastrowick and Prof. K.Dziewonski**: Land utilization survey conducted in Poland under the direction of Prof. J.Kastrowick and Prof. K.Dziewonski on country basis has followed almost the same principles as those for the land utilization survey in Great Britain, with the difference that the former is more detailed as regards the utilization of available land and some of the samples of land use map of various countries were presented by Prof. K.Dziewonski at the International Geography seminar at Aligarh in 1950.

3. **R.P.Singh(1962)**: land use and planning of Nagara village of Lohardaga taluka, Ranchi was studied by R.P.Singh. The study of the land of Nagara village was to analyze existing land use and suggest planning to give maximum and balanced returns to make it land of better living after weeding out defects of land utilization to enable the people to shoulder responsibility in progressive land.

4. **Ali Mohammad (1975)**: Examined agricultural land use and nutrition in Sitapur, Barabanki and Kheri districts. The whole work is divided in to four parts involves of fourteen chapters. In the first part he takes into account the natural environment of region, which influenced the existing crop land use and also spatial pattern of general land use, agricultural land use, and crop combination regions. The sample villages for intensive study of land use and pressure of population have been consistently discussed into one chapter. The study area has been divided into homogeneous strata and sample villages have been selected from each stratum on the basis of the systematic purposive cluster sampling. Second part is based on field work, includes population pressure and land utilization study of twelve selected villages of the region. A sample villages has been grouped in different categories and land productivity
have been given by each villages which show the extend of agricultural development as attained by the present method of technical advancement. The third chapter concerned with various components of diet to village people, the deficiency or surplus of the component and the resulting nutritional deficiency diseases. The selection of household has been done on the economic strata and essential information is collected by door to door survey. Scholar provided a new strategy for the further development of agriculture and also improved the standard of living of people in the region. He created awareness about effect unbalanced nutrition which are resulted on the health of numerous rural population.

5. **Majid Hussain (1969)**: He worked geographical basis of tube well irrigation in the upper Ganga–Yamuna Doab and selected fourteen villages; six of them lying in well drained irrigate plains having loamy soil. Three of them situated in well drained areas where the sandy soil with befits of irrigations. Three villages in ill-drained plains with clay soil and irrigation facilities partly available two untreated villages with soil varying from sandy to salty sandy.

6. **K.Z.Amani (1985)**: He worked land utilization in Gogarhi village of Kiol tahsil in Aligarh district. It has total area of 186 sq.km. and situated at 2805’N. latitude and 7802’ East longitude and it is far of 20 km north of Aligarh city.

   The study of land utilization and crop production spread over a period of forty years reveals that during this period a change in land use is seen only a places, where some fundamental alternative are taken place on account the natural of human factors these have been for instance deterioration in the soil fertility. To increase irrigation facilities, over use of fertilizer or economic factor.
Determine the cost production and marketing of the cash crops, otherwise the general patterns of agricultural land use in all these years has been closely related to the basic physical elements of land.

7. Datye V.S. and N.S. Pawar(1989): A micro-level study of two villages of Maharashtra was studied by Datye V.S. Pune and N.S. Pawar Nandurbar, an attempt is made here to study the association between productivity of selected crop and soil characters and economic factors at micro-level. Soil samples and related data were collected from two villages, namely Bhadalwadi and Kuravil differing in physical and economic aspects, result of the correlation and multiple regression analysis reveals that nitrogen is the only significant variable influencing the productivity of jowar in both village increase of bajra economic factors are significant in Bhadawadi, in Kuravali only nitrogen has significant correlation with bajra productivity of wheat is significant related to phosphorous; irrigation and fertilizer are the important factors for sugarcane production in Bhadalwadi is associated with nitrogen and in Kuravali within come.

8. Pravin Saptarshi, Parkhe Gulabrao(1993): Studied correlation between sugarcane and other crops in Junnar taluka for this investigation at micro-level scholars were used secondary data for the period of 1980-81 to 1990-91, applied. They applied correlation and regression method to find out relation between sugarcane and various crops like rice, bajra, wheat, jowar, pulses, oil seeds. They came on conclusion that during the investigation period area under sugar cane was increased and it has showed greater change.
9. **Gajhans D.S.(2007)**: Studied spatio-temporal land use in Latur district, the entire work is divided into eight chapters. The work is based on primary and secondary data for the period of 1980-81 and 2001-02 census, for the study of population. Author has calculated various densities. He has calculated indices, compound growth rate trend of area under various crops, their production and productivity for the determinates the agricultural region. Author applied crop concentration method. Finally he focused on various problems of agriculture in study area and also given proper remedies to solve them.

### 1.12 Study Plan

This study has been divided into eight chapters. The first chapter deals with meaning of agriculture and agricultural geography, significance of study of agricultural geography. The nature of geography of agriculture, the approach, place of agriculture in Indian economy, study area, objectives, data base and methodology, review of literature and study plan.

The second chapter highlights physiographic, geology, drainage, climate, soil, types of natural vegetation, socio-economic back-ground such as demographic characteristics, animal resources, agricultural implements, improved seeds, chemical fertilizer, transportation etc. in the development of agriculture.

Third chapter deals with pattern of irrigation comprising modes of irrigation, intensity of irrigation, net irrigation area which mainly responsible for agricultural changes, its results on agricultural land use and cropping pattern during 1980-81 to 2004-05 described in detail.
Fourth chapter is devoted to the changes in various land use categories like concepts of land use, classification, general land use pattern and changes therein, tahsil-wise trends of land use, over all volume of change in land use, land use efficiency.

Fifth chapter deals with changing cropping pattern, tahsil-wise trends in area under various crops, crop combination regions, and changes therein, crop concentration, pattern of crop diversification and changes therein in the study area.

Sixth chapter covers the study of broad trend and variation in production and yield of selected crops in the study area. tahsil-wise trends of production, yield, productivity measured by Jasbir Singh' method (1972) yield index and crop concentration index are also analyzed in this chapter.

Seventh chapter concerned with key studies or selected villages such as general land use, cropping pattern and livestock agricultural implement etc in selected villages at micro-level.

The Eighth and last chapter is regarded with conclusion of the study to get comprehensive view. An attempt is made to discuss the agricultural problems of the study region and suitable suggestions are also given to change the situation and thereby to achieve agricultural development.
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Chapter-II

The Geographical Personality of the Region, Physical and Non-physical Determinants of Agriculture

2-A Physical Determinants

2.1 Location and Boundaries
2.2 Historical Background of Study Area
2.3 The Physiography
2.4 Geology
2.5 Drainage
2.6 Climate
2.7 The Soil
2.8 The Vegetation

2.9 Non-Physical Determinants of Agriculture

2.9 Population
2.10 Live-stock
2.11 Agricultural Implements
2.12 Transport
2.13 Other Inputs

References