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CHAPTER-I

INTRODUCTION

1.1 INTRODUCTION

Agricultural development in a country like India is crucial to its economy both for output and to meet the basic needs of the people and for the employment and income, it provides to the bulk of her workforce. Inspect of the diminishing of share of gross domestic product from agriculture over the decades, the economy, as whole, continues to vitally hinge on agriculture. Therefore, the agriculture is the basis of the entire economy in general and rural economy in particular in the district. The natural phenomena and their effective environment, socio-economic-political dimensions, structural situations, the regional institutional set-up varying over geographical area together provide a climate for a particular natural of agricultural development. Given this need for agricultural development and even for sleeping up it is tempting to disregard environmental considerations or a best to give. Secondary importance to them, conceding them only when they don’t apparently conflict with development goals. A deterioration of environment adversely affects development itself and harms human beings, particularly the poor in whose name development is undertaken.

Environmentally sound or sustainable agricultural not only ensures continuity of development, but would also promote equity and alleviate poverty. The concept of sustainable development came into prominence in 1980 and evolved itself as one of the main stream development paradigms by eighties. Sustainable development has been defined in terms of meeting needs of present generation without comprising the ability of future generations to meet their needs (World Commission on Environment and Development, 1987). According to this anthropocentric
definition sustainability becomes meaningless, when human survival is under threat. The definitional objectives of sustainable agricultural development appear to be of all toll order. Broadly, these objectives can be grouped under whole properties of agro-eco-system-productivity, stability, sustainability and equitability. In the walk of population explosion and food security, the green revolution technologies appeared to be the answer but they are associated with the low sustainability and medium equitability.

Between 1960 and 1970, when the food security was under threat. India launched the HYV and Chemical fertilizer centered technology in a big way. Through this high input intensive technology has helped achieving the goal of enhanced food production, it has led to numerous environmental problems, which became conspicuous by the early eighties. Further, the complementary nature of these inputs with water has led to the concentration of this technology in well watered regions of the country. The major environmental problem of such as intensive agriculture include degradation of soils due to in appropriate use of chemical fertilizer and mono-culture degradation of ground water quality, deforestation etc. which further aggravated the problems of degraded soils, problems of pests and plant diseases, which have remained uncontrollable. This has resulted in aggravating regional inequalities in the county.

Now the concept of development has basically changed and it represents much more than economics and the simple quantitative measurement of income, employment and inequality. It has been redefined in terms of the reduction or elimination of poverty, inequality and unemployment within the context of growing economy. Simultaneously, concept of agricultural development has changed. As Gopal Kishan puts (1979), agricultural development is as multi-
dimensional concept and it must encompass the meaning both of agriculture and development. It may be envisaged as the agricultural performance of the area in terms of economic gains in yields, social justice, it delivers and ecological balance it maintains. Therefore, approaches of P.V. Shenai, V. Desai and Ali Mohammad measuring agricultural development through the analysis of agricultural productivity are incapable of incorporating these considerations.

Further, the benefits of agricultural developments have not been equitably distributed, socially and spatially. In India those regions ecologically suited to be technology offered for agricultural development have prospered, while those with less suitable endowment of natural resources, such as some tahsils of the Nanded district, have lagged behind. As Lipton (1978) says, breeding cereals for high nutrient response does little for regions suffering both from poor soils and from lack of water. Agricultural development envisaged through improved seeds has therefore, remained a localized phenomenon concentrated in favourable regions. Similarly new agricultural technology has been suited to the need of only rich farmers (B.H. Farmer, 1977). Thus, there is huge spread of new yield-raising technology in some tahsils in the study region, whereas, few tahsils are logging for behind. The analysis of this unequal distribution of the benefits of agricultural development is the major themes of this investigation.
1.2 CONCEPT OF AGRICULTURE

From the time of immemorial, agriculture is the important primary activity of human being. Man-made snail speed progress during the early stages of history as the environment, he existed in, was harsh and he was not materially and technologically equipped to cope with the severity of surroundings. In fact, primitive man subsisted by gathering nut, grains, roots, fruits and catching animal, birds and fish for meat. Thus, he learned to harvest before he discovered how to plant. The legends of the beginning of cultivation cover a wide range of speculation. With the increase in population in the sedentary communities, there was more demand for food. The development of agriculture was in intensification by man of his food extractive process from the wild ecosystems. More food could be obtained from a given area of a land by encouraging plant and animal species found useful and discouraging others. Whereas, systematic study of agriculture is begin during the last century.

The word ‘agriculture’ comes from a Latin term ‘Agricultura’ which has its origin in the words, ‘ager’ meaning a field and ‘cultura’ meaning to cultivate. Watson’s Longman Modern English Dictionary (1976) defines the word agriculture as the science or the art of cultivating soil, growing and harvesting of crops. Agriculture is different from ‘Pastoral Farming’ which is the practice of breeding and rearing of certain herbivorous animals. For lack of an appropriate word, agricultural geographers used the word ‘agriculture’ to cover both cropping and grazing. Humphrey’s American Peoples Encyclopedia (1965) mentions under the head ‘Agriculture’ the production crops, livestock and its products. It is in such a broad context that the term is used here to include both rearing of animals and rising of crops with this definition of agriculture.
The evolution of occupational pattern of mankind has passed through successive stages of development. The earlier hunting and wild collection stage passed through breeding, rearing and domestication of animals to the cultivation of useful plants. All these activities are known as a primary occupation in the economic sense. With the greater interdependence of different communities and multiplication of human wants, Secondary, tertiary and quaternary activities came into the scene. Thus, Agricultural Geography is by far a science of primary economic activities where, the complex environmental factors are directly studied.

1.3 MEANING OF AGRICULTURAL GEOGRAPHY

Agricultural Geography is a specific study of the spatial pattern of agricultural activities in the dimensions of the time and space. It involves organization soil resources in interaction with climatic, biotic and human factors. In the world of bewildering disparity and constant change, the primary occupation of man has also transformed during successive periods of human history and in different locations. The changes in resources use technology, scientific knowledge; social institutions and human aspirations have been reflected in the use of native land resources.

Traditional Agricultural Geography was largely production oriented, where the contents were confined to the distributional patterns of crops and their causative factors. It was only at a later stage that empirical studies based on normative methods and linear programming a new direction found its way. Location explanations became more accurate by the introduction of individual spatial and behavioural factorial analysis expressing geometric models and general systems. As early as 1826, Von Thünen, the founding father of Agricultural Location Theory introduced maximizing assumptions in Agricultural Geography.
Despite of these early seeds of innovative thoughts, the science of agricultural geography remained in background due to a greater concern of Geographers for studies pertaining to the cultural landscape (Sauer, 1952) diffusion of innovation and ecological studies of domestication of plants and animals. This science remained a part of plant ecology, where Geographers were pre-occupied with explanations for the distribution of crops, only such factors as soil fertility, climatic suitability and slopes were considered physical determinants of agricultural production. Gross generalizations were made mainly on the basis of fragmental case studies and no synthesis was attempted in a systematic manner. Thus, Agricultural Geography is the discussion of the cultivation of field on the earth’s surface. Some definitions of Agricultural Geography are as follows…..

* SINGH JASBIR AND S.S.DHILLON (1984) – As science Agricultural Geography is concerned with the formulation and testing of hypothesis, interaction of spatial distribution and location of various characteristics of agricultural activities on the surface of the earth and measurement of geographic relationship. Furthermore, as a science, it also seeks to identify, describe and classify the problems of agriculture against a geographic backdrop.

* JANET,D.HENSHALL (1967) – The study of Agricultural Geography is concerned with individual farms having certain characteristics of area, soil, crops, livestock, etc. and complicated functional relationship based on the natural environments, agricultural economy on rural society.

* ANDREAE (1981) – The science of the agriculturally transformed earth surface, with all its associated natural, economic and social interrelationships as reflected spatially.
ZIMMERMANN (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.

All above definitions clearly show that the Geographers differ much in their opinions about the definition of Agricultural Geography. In fact, like all the other disciplines of knowledge, the definition of this sub-branch of geography is also changing in space and time, the differences in the definitions may be the subject matter of Agricultural Geography is the plants and animal husbandry.

1.4 DEVELOPMENT OF AGRICULTURAL GEOGRAPHY

The development of Agricultural Geography has been obscured by several interruptions and contrasting approaches as a part of cultural landscape it is dominated the field of Human and Economic Geography right from the earlier Greek-Roman period. Strabo’s Geographia has ample examples of the description of the agricultural landscape of the Mediterranean littorals. But as a well defined discipline, it is of recent origin. This branch of geography developed as a part of Economic Geography with emphasis on understanding the men’s relationship with food resources, raw materials and other commodities. Simons has traced out some of the earliest studies of Agricultural Geography, which were concerned with crop distribution and their regionalization. The work of Strabo, Pliny and Arab Geographers of Middle Ages were confined to describe the regional variations of agricultural activities in the countries of this dominance. Similar contextual work appeared in England by Arthur Young and in German by J.N. Schwann.

Alexander Von Humboldt was initiated of the founder of Modern Geography. He considered agriculture as a part of Systematic Botany.
Similarly, Von Thunen and other German Economist gave in depth consideration to the models of location of agricultural activities. Krzymowski and Waibel’s were give important contribution for Agricultural Geography as a separate sub-field. They wrote separate articles on ‘Scientific position of Agricultural Geography’ and ‘Problems of Agricultural Geography’ respectively. By this period, the global problem of food scarcity was vigorously felt and its solution was sought both by Natural Scientists as well as Geographers. Food surpluses were awaiting international outlets in some developed countries, while millions suffered from hunger, malnutrition in Tropical Countries. These promoted Geographers in the first half of the 12th Century to assess global requirements of food and to establish a correlation between farm production and requirements of different countries. Geographers seem to be better equipped than other specialists to take up the challenge of food problems because of their inter-disciplinary training.

New Agricultural Geography was born in Western Europe and gradually in the U.S.A. Geographers increasing sought to expand the complex interactions of physical and socio-economic conditions governing crop production in specific area. Dodge (1911) Jones and Sauer (1915) were focus on land-use, soil and slope of small areas together with its recording on large scale maps. During this period the interest among Geographers for extensive land-use surveys emerged. Stamp had developed and adopted census model for land-use study of China. Unit Area Model evolved by Hudson which was applied in the Tennessee Valley and other areas of the United States. These models were subsequently applied for land-use survey in different parts of World. The Commission on World Land-use Survey, which was set up by the International Geographical Union to evaluate procedures and methods of land-use surveys. Crop distribution at regional and global scales was
studied by American Geographers. Several observations on agricultural regions were presented at the meeting of the Association of American Geographers before the outbreak of the First World War. During the inter World War Period (1919-39) American Geographers namely Baker who was studied the regions of the North America, Johnson studied Agricultural Regions of Europe, Jones discussed about Agricultural Regions of South America, Van Valkenburg studied Agricultural Regions of Asia and Taylor Agricultural Regions of Australia. In 1932, Jones and Witlessly developed a scheme of classification of agricultural land-use which remained as model for several decades.

During the late thirties and early forties development of Agricultural Geography was related because of the World Wars and nothing concrete could be added to the field. In the following decade there was considerable upsurge in the content and methodology of the subject. Shafi was modified and improved the criteria to identify Agricultural Regions. Helburn suggested eleven criteria for delineation of agricultural regions. New Statistical Methods of Crop-combination Analysis were evolved. Weaver’s Method (1954) initially designed for the investigation of agricultural activities in U.S.A. was widely applied in other area. Coppock applied Weaver’s Least Deviation Model in the study of the U.K. and Tropical Africa in a new modified from namely Least-Square-Method. The same was used by Jasbir Singh (1976) in his study of Agricultural Geography of Haryana.

These preceding two decades have witnessed many new trends in agricultural geography. There has been an all round development and many new sub-fields have been emerged. Several conceptual methodological and thought provoking researchers were conducted. The studies of this period laid much emphasis on theoretical and methodological components and showed less concerned for regional
narrations. An overview of contemporary works in the field of agricultural geography indicates a multiplicity in its approach, content, methodology and scale of study. Almost every aspect of physical, social, cultural and economic activities is covered by regular census conducted at an interval of ten years. International Association of Agricultural Economist published on authentic World Atlas of Agriculture, which was followed by several publications or World Health Organization, Food and Agricultural Organization etc. The Indian Agricultural Statistics are well documented right from village level to State and National Level. An important development in the field of agricultural geography in India was the appointment of National Commission on agriculture in 1976. The Commission has already published several reports on the status of agriculture in India. Jasbir Singh, Shafi, Bhardwaj, Tiwari, Majid Hussain and Noor Mohhammad have initiated investigation on varied aspects of agricultural geography in India. Geographers have profusely made use of interdisciplinary research findings in pedology, agro-climatology, plant ecology, agricultural economic and animal husbandry.

1.5 AGRICULTURAL DEVELOPMENT IN MAHARASHTRA

Agriculture is playing key role not only in the economy of the State but also of the nation. Nearly 70% of the population of the state as well as nation derives livelihood from agriculture and related activities. Agriculture is a leading occupation on the 60% of the state’s total geographical area. As compare to India Maharashtra state has only 11.4% net sown area and 4.6% of the gross irrigated area of the country. Out of the total agricultural land nearly one half of the acreage of the state is under food grains, especially jowar and one third under cotton cash crops.

During the third five year plan Rs.62.34 Crores were spent on the development of agriculture in the state of Maharashtra. During the fourth
five year plan Rs.196 crores were spent on agriculture. During the seventh plan about Rs.614 crores and in the eighth five year plan about Rs.1750 crores were spent on agriculture and allied services. In the year 2010-11, about Rs.12327 crores were provided for agriculture. However, Maharashtra government has made remarkable agricultural progress through five years plan.

In 1960-61 about 18.69 million hectares of land was under cultivation, while in 2011-12, it increased up to 22.61 million hectares. It is marked an increase of about 20.97% from 1960-61 to 2011-12. The total net area sown was registered 17.87 million hectares in 1960-61, as against 18.56 million hectares in 2011-12, recording 3.86% increase between 1960-61 to 2011-12. The proportion of gross irrigated area was increased from 1.22 million hectares in 1960-61 to 4.05 million hectares in 2011-12, marked 231.96% increase during the same period.

The spatial cropping pattern of the state is greatly influenced by topography, climate and soils. It also has been experienced great temporal variation in cropping pattern during the last six decades. The jowar is the principal food grain of Maharashtra. It is extensively grown in both kharif and rabi seasons over fertile alluvial soils of river basins of Maharashtra plateau with moderate rainfall. In 1960-61 area under jowar was 6.28 million hectares, up which accounts 33.6% of gross cropped area of the state. The Rabi jowar reveals considerably higher proportion of land which accounts 20% of gross cropped area. However, in the subsequent decades jowar crop shows a decline trend in both rabi and kharif crops. The area reduced upto 4.06 million hectares in 2011-12. In 1960-61 the yield of jowar was marked 672kg./hect. As against 850kg./hect. In 2011-12. In 1960-61 are under bajara was 1.63 million hectares, while it increased by 25% in the 1970-71. But in 2011-12, area under bajara was marked 1.03 million hectares, recording 36.80% decrease during the same
year. The rice crop shows consistently increasing trend throughout from 1960-61 to 2011-12 in area 1.3 million hectares to 1.5 million hectares production. 1.32 M.T. in 1991-92 to 2.6 M.T. in 2011-12 and average yield of rice in 1960-61, was 1054kg/hectares to 1776kg/hect. In 2011-12. The tremendous increase in the yield of wheat is observed from 1960-61 to 2011-12. The average yield of pulses mainly gram, tur, udid etc. are showed the important in per hectare in the Maharashtra state.

The cotton is the first ranking crop in Maharashtra and shows consistently increasing trend in area throughout from 1960-61 to 2011-12. In 1960-61 about 1.67 million hectares area was under cotton cultivation and it reached upto 3.94 million hectares in 2011-12. Sugarcane is also a leading cash crop and restricted to the irrigated area of Maharashtra state. In 1960-61, area under sugarcane was 0.15million hectares, while in 2011-12 it was increased 0.96 million hectares. The Western Maharashtra particularly district of Sangli, Kolhapur, Satara, Ahmednagar, Solapur have made good progress in agricultural sector.

1.6 STUDY AREA

Nanded District is situated in south-eastern part of the Maharashtra State. It lies between 18°15’N to 19°55’N latitude and 77°7’E. to 78°10’E longitude.

Nanded district is bounded by Yawatmal district on north, Latur district on the south-west, and Parbhani district on the north-west, whereas, on the east and south-east bounded by Adilabad and Nizambad districts of Andhra Pradesh and on the south-west by Bidar district of Karnataka State.

The study area has an area of 10502 sq.kms. which is covered about 3.41% of the total area of the Maharashtra State. Nanded district has 3357259 populations as per 2011 census.
Nanded district comprising eight tahsils namely Nanded, Hadgaon, Kinwat, Bhokar, Biloli, Deglur, Mukhed and Kandhar.

1.7 OBJECTIVES

Presuming vital significance of agricultural development for rural development following objectives has been put fourth for the present investigation…..

* To assess the spatio-temporal relationship between variable and to identify the levels of the agricultural development in the study region.

* To analyze spatial variation in level of agricultural development in the context of physio-socio-economic environment.

* To study the population characteristic and its effect on agricultural development.

* To assess the effect of use of mechanical and bio-chemical inputs on development of agriculture.

* To analyze and map the spatio-temporal distribution of irrigation facilities and its effect on development of cropping pattern.

* To study the general and agricultural land use and variation in the tahsils of study region.

* To find out the agricultural problems and suggest suitable remedies for balanced agricultural development of various tahsils in the study region.
1.8 HYPOTHESIS

Hypothesis is required for any research to arrive at specific goals. It is provisional formulation and tentative solution of the problem facing the specific knowledge. In this work also hypothesis can help a great deal for attaining scientific approach.

i) There are spatio-temporal changes in agricultural development in the study region; the environmental balance and input differential are responsible for the disparity in agricultural development.

ii) The agricultural development are controlled by the physiography of the region, and input differential is the chief factor behind the growth disparity in agricultural development.

iii) People’s awareness, attitudes and perceptions towards environment are changed, sustainable agricultural practices and achieving the objectives of agricultural development, the literacy, market forces, technologies and institutional factors have important role in agricultural development.

1.9 DATABASE AND METHODOLOGY

A variety of sources of data have been tapped for the preparation of the present investigation. The relevant information and data regarding agricultural land use, crop productivity and inputs collected and used for the period 1991-92 to 2011-12, comes both from primary and secondary sources. The primary data is the raw data collected through different sources for which special questionnaires were designed. Information collected through various Talathi Offices, Agricultural Offices and Farmers.
The broad picture of the present pattern of agricultural development of the region is prepared with the help of secondary data. The block has been taken as a unit of analysis. Most important source of agricultural statistics is the Office of Commissioner of Agricultural Department Pune, several publications are brought out by this office, such as Season and Crop Report, Basic Agricultural Statistics of Maharashtra, Agricultural Census of Maharashtra, etc. Statistical Department Office of Agriculture Commissioner, Pune, periodicals Economic Survey of Maharashtra, Gazetteer of Nanded District, Socio-economic Review and District Statistical Abstract of Nanded District. Data regarding population obtained from District Census hand-book of Nanded District. Data regarding the major, minor irrigation schemes are obtained from Irrigation Department, Government of Maharashtra. Data regarding Percolation tank and K.T. Wear are obtained from Z.P. Office, Nanded, and data regarding Drip Irrigation obtained from District Superintendent Agriculture Office Nanded.

Certain data like consumption of pesticides, fertilizers, size of operational holdings etc. are not available at tahsil level. Information pertaining to those aspects has been collected through questionnaires, personal interviews and visit to district and tahsils head-quarters in the study region. This considered necessary to supplement information by in depth micro studies at village level for these purpose the villages are selected by random sample. A micro level study includes plot to plot survey of land and information of relevant aspects such as cropping pattern, productivity, number of wells, consumption of fertilizers, agricultural implements, and pesticides irrigated area obtained by questionnaires.

These data were scattered in published records of different departments of Government of Maharashtra State. These data were the
transformed into rates and ratios. Analyses have been taken with both absolute and percentage values. The methods applied include Weaver’s, Rafiulha’s and Doi’s Method for delimitation of crop combination in the study region. Bhatia’s Method (1956) Location Quotient is used for the calculation of crop concentration. To calculate the agricultural productivity the technique introduced by Kendall (1939), such as Ranking Coefficient Technique, Enyet’s Productivity Index are used.

The essential matter derived is presented in figures, diagrams, graphs and tables, synthesizing a large body of data into present investigation. Most of maps are choropleth maps on which the areal differences in the importance of particular elements are shown by the difference in the density of shading. In most of these maps, other information relevant to that particular element has been presented diagrammatically. These diagrams help in comprehension of the discussion.

1.10 REVIEW OF LITERATURE

These are a number of studies dealing with the measurement of agricultural development. These studies have included different indicates for analyzing the level of development.

1. P.S.SHARMA (1964, 1972) : Deal with this problem on all India Level. Sharma has selected Seventeen Indicators and grouped them into three classes, as follows….

a) Agricultural Resource Base (rainfall, soil fertility, per capita net sown area, percentage irrigated area, double cropped area, under cash crop.)

b) Adoption of New Technology (HYV, fertilizer, plant protection, mechanization and area contour banded)
c) Agricultural Infrastructures (credit, communication, marketing, storage capacity, rural electrification and social setting.)

These indicators have been employed in the study by the Agro-economic Research Centre of JNKVV (1977) for Madhya Pradesh. If the contention of agricultural development is the process through which man has utilized the physical base of agriculture to raise production, the physical base should be kept neutral to facilitate the evaluation of the regional disparity in human efforts for development, otherwise it would produce erroneous picture, further, more existence of rich potentiality of physical resources doesn’t say anything about its development, rather the manner and extent of utilization of these potentialities can note position of development of these resources, it is therefore, these potential resources should not be included in the study of levels of development.

2. V. DESAI, (1976), P. V. SHENOI, (1975): They have concentrated on trends of consumption of yield raising technologies and of yield and output of major crops. In between of these two extremes are studies, which have considered indicators of both input as well as output group. Two studies are worth-mentioning in this respect.

3. GOPAL KRISNAN (1979): He has presented a comprehensive concept of agricultural development. He says that agricultural development is a multi-dimensional concept and it must encompass the meaning both of agriculture and development. It may be envisaged as the agricultural performance of an area in terms of economic gains in yields, social justice it delivers and ecological balance it maintains. Indicators of these aspects have been presented into seven groups- crop productivity, variety of crops,
quality of crops produce, diversification of agriculture, commercialization of agriculture, degree of equity in farm income and nature of agrarian relations and farm management. Indicates for these aspects are yet to be evolved and it seems that this approach is more suitable for micro areas than micro like present one.

4. MOONIS RAZA (1987) : He presented study on the name of level of regional development of India. In this study, has selected forty-one indicators of agricultural development. These have been grouped under four sub-sets of productivity, production conditions, agrarian relations and change in agriculture. Such a gigantic work is not feasible without computer facilities.

5. C.K.JAIN (1988) : He made an attempt to evaluate and analysis of spatial agricultural development in Madhya Pradesh. He has been selected indicators from both sectors input and output. On output side, present agricultural productivity measured in terms of Standard Nutritional Units, value of crops per unit of cropped area and production of food-grains per agricultural worker, has been taken into account. On input side only eight indicators have been selected. They are …. 

1) Irrigated area as percentage of gross cropped area 
2) Percentage cereals are under high yielding varieties of seeds. 
3) Use of fertilizers Kg./hact. of cropped area, density per thousand hectares of cropped area. 
4) Oil pumping sets. 
5) Electric pumps. 
6) Tractors.
7) Iron plough.
8) Carts.

Value of these indicators has been utilized by Ranking Coefficient Method and Composite Index of development.

6. J.P. SEXENA AND S.N. MEHROTRA: They have written an article namely, ‘Regional Imbalances in Agricultural Development’ in Madhya Pradesh, which is published in book entitled “Selected Reading in Indian Geography”, which is edited by S.N. Negi (1994). For this purpose the authors have based the study on twelve selected district indicators, which may be grouped into six categories namely,

1) Demographic
   a) Rural Population as percentage to total Population.
   b) The agricultural workers as percentage to total workers

2) Land use features
   a) New area sown per capita of total population
   b) Double cropped area as percentage to gross cropped area.

3) Agricultural practices and resources
   a) Working cattle per 100 hectares of net area sown
   b) Irrigated area as percentage to gross cropped area
   c) Number of ploughs per 100 hectares of net sown area.

4) Agricultural Credit (Co-operative)
   a) Credit in rupees per hectare of gross cropped area like the previous indicator. This is also a measure for agricultural development. Money is generally
advanced to the farmers by various agencies, but the rural co-operative banks are now assuming major role.

5) Agricultural output
Credit in rupees per hectare of cross cropped area. It has to be seen whether the measures taken by government or the farmers for the development of regional agriculture are sufficient or not and this has to be measured in terms of gross output in rupees per hectare of gross cropped area. Naturally the higher the output the greater the agricultural development and vice-versa.

6) Cropping Pattern
   a) Yield rates per hectares in kg.
   b) Cropping intensity

First indicator is important because it shows whether the district lags behind the State average or not. Though high yield rates are the results of several factors like fertile soil, irrigation facilities or any other, such reason. Yet these indicate not only the degree of utilization of arable land but also the levels of agricultural development attained by the farmers. Whereas, second indicator express the intensification of agriculture reflects the productivity capacity of the cultivated land. It shows the nature of the cropping pattern and indirectly, it shows light on the possibilities of increasing production through multiple cropping.

7. P.V.SHENOI (1975), V.DESAI (1976) : Measuring agricultural development through the analysis of agricultural productivity are incapable of incorporating these consideration. These require some basic modifications.
8. LIPTON (1978) : He says breeding cereals for high nutrient response does little for regions suffering both from poor soils and from lack of water. Agricultural development envisaged through improved seeds has, therefore, remained a localized phenomenon concentrated in favourable regions.

9. ALI MOHAMMAD (1975) : Examined land use and nutrition at Sitapur, Barabanki and Kheri districts. The entire work is divided into 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 crop combination regions. The sample villages for intensive study of land use and pressure of population have been consistently discussed into one chapter. Second part is based on field work, includes, population pressure and land utilization and study of twelve selected villages of the region. A sample villages has been grouped in different categories and land productivity have been given 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 of village people. Scholar provided a new strategy for the further development of agriculture and also improved the standard of living of people in the region.

1.11 ORGANIZATION OF THE STUDY

The study has been divided into seven chapters. The first chapter deals with the introduction, concept of agriculture, meaning of agricultural geography, agricultural development in Maharashtra, study area, objectives, hypothesis, database and methodology, review of literature and organization of study.
The second chapter related with physical features and comprises location and boundaries, review of relief, climate drainage pattern, soils, natural vegetation. From the viewpoint of their suitability for the development of agriculture. Population growth, literacy, pattern of ownership land, agricultural credit finance, transportation, animal husbandry, agricultural implement, improved seeds, chemical fertilizers etc., have taken into account to analysis relevant cultural features.

The source of irrigation is the subject matter of third chapter and deals with need of irrigation, availability of water resources, source-wise irrigation development, source of irrigation, intensity of irrigation etc.

The fourth chapter consists meaning and importance of general land-use, land-use classification, tehsil-wise trends in land-use, degree of dynamism in land-use pattern from 1991-92 to 2011-12.

In fifth chapter an attempt is made to study the recent trends in crop land use, growth trend in area of selected crops, tehsil-wise area under various crops, crop combination and changes therein, crop concentration pattern of crop diversification and changes therein in the study region.

The sixth chapter deals with the production and productivity. It is divided into two parts. The first part an attempt is made to study trends in yield of selected crops, growth of agricultural output, tehsil-wise trends in crop production, agricultural productivity, overall productivity and level of agricultural development. Second part of the chapter concern with case study selected villages at micro-level.

The seventh chapter is regarded with conclusion of the study to get comprehensive view. An attempt is also 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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