Chapter I
APPRAISAL OF THE PROBLEM

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CHAPTER I

APPRAISAL OF THE PROBLEM

1.1 Meaning of Agriculture and Agricultural Geography :

The word 'Agriculture' comes from a Latin term "Agricultura" which has its origin in the words 'ager' Meaning a field and 'cultura' Meaning to culture or cultivate. Watson's Longman Modern English Dictionary (1976) defines the word agriculture as the 'Science or the art or the practice of large scale soil cultivation' in order to produce crops.

'Agricultural', in agricultural geography implies the subject matter. Agricultural geography thus means the "Geography of agriculture". Etymologically the expression 'agricultural geography' has Greek and Latin roots. The word 'geography' is derived from a Greek word "geographia" which stems from two words, namely Geo' Meaning the earth and 'graphia' meaning to describe. The etymology and the dictionary meaning of the phrase suggest that agricultural geography is the description of the art of large-scale soil cultivation with reference to natural environment and human circumstances.

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 of crops, live-stock and their products. It is in such a broad context the term is used here to include both rearing of annals and raising of crops".

The Study of relationship between economic activities, namely, the primary (Agriculture and mining) the secondary (industry) and the tertiary (services) and their environment was given a special title of the science of 'geonomics' or 'geonomo'. Since agriculture is one of the primary economic activities, the study of relationship of agriculture with its environment may well deserve a title, the science of 'geoagricultura'. The question arises is agricultural geography a science or an art? Agricultural geography can be considered a science in view of its techniques of analysis, methods of interpretation and its approaches to the investigation of agriculture. 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 relationships. Furthermore, as a science it also seeks to identify, describe and classify the problems of agriculture against a geographical backdrop. Agricultural geography according to Hillman (1911) constitutes a comparative study of the agriculture of countries and continents. Bernhard (1915) attempts to justify the postulate that agricultural geography is concerned with bringing a light the regional variations in agriculture and the factors responsible for them.
Reeds (1964), however, sums up by saying that agricultural geography seeks to describe and explain regional differentiations and interrelationships on the basis of agricultural characteristics. Further more agricultural geography is defined by Andreae (1981) as the science of the agriculturally transformed earth’s surface, with all its associated natural, economic and social interrelationships as reflected spatially. The primary purpose of agricultural geography is undertake a geographical enquiry into the regional differences and spatial variations in agricultural formations and geographic associations, and it lends itself to a greater quantification in the description of regional distributions. In agricultural geography, facts are arranged in an orderly manner. Each investigation involves four stages i) identification of the problem, ii) collection of relevant data, iii) formulation of hypothesis, and iv) testing and modification of the hypothesis to provide an adequate explanation [Coppock, 1969].

1.2 SIGNIFICANCE OF THE STUDY OF AGRICULTURAL GEOGRAPHY:

Land is the most significant among the natural resources of the country, and most of its inhabitant depend on it for their livelihood, yet the average yield of India remains to be one of the lowest in the world.

In general most of the villagers suffer both from under nutrition and mal-nutrition. Agriculture includes all plants, poultry birds and animal products for direct on indirect consumption by humanity. 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 seek information on not only how but also from where human requirements are to be met.

Almost all the nations of the world have embarked on agricultural production with accent on establishing the nature of conditions surrounding that production in specific areas or of the conditions favourable 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 geographer which in fact highlights the significance of agricultural geography in the present development context. To sum up, the major objective of agricultural geography is the analysis of the agriculturally structured areas and their natural, economic and social relationship and organizations as reflected spatially. Such agricultural geographic studies are the necessary for any transformation activity of man, particularly for planning and development purposes.

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

1) The agricultural specialist, who wishes to improve the structure of agriculture food stuffs.
3) The irrigation engineer, who plans to introduce new irrigation schemes.

4) The regional planner, who is on the lookout for the most favourable location for recreation areas.

5) The transportation engineer who has to lay new rail-road lines.

6) The demographic planner who plans public services and utilities and.

7) The numerous other specialist.

1.3 THE PLACE OF AGRICULTURE IN THE NATIONAL ECONOMY:

Agriculture has been man's most important occupation since time immemorial. It constitutes the foundation of all social, cultural and economic structure of mankind. In all studies of changing interactions and real associations of man and his habitant, the complex system of physical and biotic processes are predominantly exhibited by human activities in deriving food and raw material from soil.10

Agriculture forms the backbone of the Indian economy and despite concerned industrialization in the last four decades, agriculture occupies
a place of pride. Being the largest industry in the country, agriculture is the source of livelihood for over 70 percent of population in the country.

Figures supplied by the national income Committee and the Central Statistical Organization show clearly that agriculture contributed 57 percent of the national income in 1950-51 but contributed now around 32 percent of the national income. Firstly, agriculture contributes even now a major share of the national income in India. Secondly the share of agriculture in national income, however has been decreasing continuously and the shares of the manufacturing and service sectors are increasing.

Comparison can be made between the position of agriculture in India with the in the other countries as regards the share of agriculture in national income.

In the United Kingdom, agriculture contributes only 2 percent of the national income, in U.S.A. it is 3 percent in Canada it is 4 percent, in Australia it is 5 percent and so on. The more developed a country, the smaller is the share of agriculture in national output. India, having not yet reached the stage of advanced economy, has an agriculture sector which is still the dominant one in the country.

Agriculture dominates the economy to such an extent that a very high proportion of working population in India, is engaged in agriculture. According to India's census figures, between 67 to 69 percent of India's working
population is engaged in agriculture. But in the United Kingdom and United States, only 2 to 3 percent of the working population is engaged in agriculture. In France, the proportion is about 7 percent and in Australia, this is about 6 percent. It is only in backward and less developed countries that the working population engaged in agriculture is quite high. For instance, it is 42 percent in Egypt, 50 percent in Burma, 52 percent in Indonesia and 72 percent in China.

Indian agriculture has been the source of supply of raw materials to out leading industries, cotton and jute textile industries, sugar, Vanaspati and plantations all these depend on agriculture directly. There are many other industries which depend on agriculture in an indirect manner. Many of our small scale and cottage industries like handloom weaving, oil crushing, rice husking etc. depend upon agriculture for their raw materials together they account for 50 percent of income generated in the manufacturing sector in India. But then, in recent years, the significance of agriculture to industries is growing down as many more industries have come up which are not dependent on agriculture. Under the Five Year Plans, iron and steel industry, chemicals, machine tools and other engineering industries, air craft etc. have been started. However, in recent years, the importance of food processing industries is being increasingly recognized both for generation of income and for generation of employment.

Importance of Indian agriculture also arises from the role it plays in
special emphasis on agricultural development, particularly after 1962, the previous trend of stagnant agriculture was reversed:

1) There was steady increase in area under cultivation.

2) There was a steady rise in average yield per hectar, or rise in agricultural productivity and

3) As a result of the increase in area as well as increase in yield per hectare, total production of all crop recorded a rising trend. Area under all foodgrains increased from 23 million hectares to 40 million hectares between 1949-50 to 1994-95. During the post green revolution period (1968-95) the annual area growth rate was quite low: (all crops 0.3% food grains 1.2% and nonfoodgrains 0.7%).

During the period 1968-94, the increase in area under rice was only by 11 percent while the area under wheat rose by 77 percent. Under nonfoodgrains, spectacular progress was achieved by potatoes (increase in acreage during this period was by 175% and the annual area growth rate was 3.9%) and plantation crops increase in acreage by 67%. Broadly speaking, the decline in agricultural productivity in general and foodgrains productivity in particular, which was a marked feature before independence and to some extent in the three years following Independence was positively reversed with the introduction of planning in 1950-51. With the extension of irrigation and application of intensive methods of cultivations and after
the introduction of modern agricultural practices including the adoption of hybrid seeds, there has been a steady and continuous increase in yield per hectare of all crops. During the first period (1950-65) food grains production had increased at an impressive annual rate of 3.2 percent. During the period 1964-65 to 1994-95 food grains production had increased at an impressive annual rate of 2.6 percent the major cereals viz rice and wheat, recorded high rates growth (2.5 and 5.9 percent respectively), but coarse cereals and pulses recorded relatively lower growth rates (0.4%). Oil seeds, sugar cane, and cotton recorded 2.3 to 2.9 percent annual growth rate during the period of 1964-65 to 1994-95. Potato recorded 5.1% annual growth rate from 1964-65 to 1994-95.

All the Five Year Plans have given considerable importance to the creation of additional irrigation potential. The first Five Year Plan devoted as much as 25 percent of the total plan (Rs. 450 crores) out lay on irrigation and added 3 million hectares of irrigation potential generally, however between 10 to 12 percent of the total plan outlay has been on the creation of irrigation potential ranging grow 5 to 10 million hectares. During seventh plan Rs. 17530 crores was allotted to the creation of irrigation potential. At the commencement of the Eighth plan in 1992 there were 158 major, 226 medium on and 95 extension, Renovation and modernization projects carried forward from the previous plans. Since the adoption of the new agricultural strategy in the sixties, the consumption of chemical fertilizers has been growing rapidly. During 1951-52 70 thousand metric tones chemical fertilizers were used
India's trade. Agricultural products tea, sugar, oil seeds, tobacco, spices etc. constitutes the main items of exports of India. Broadly speaking, the proportion of agricultural goods which are exported may account to 50 percent of our exports, and manufactures with agricultural content (such goods as manufactured Jute, Cloth and Sugar) contribute another 20 percent or so, and the total comes to 70 percent of India's exports\textsuperscript{14}. This has great significance for economic development of the country.

Importance of agriculture in the national economy is indicated by many facts for example, agriculture is the main support for India's transport system, since railways and road ways secure bulk of their business from the movement of agricultural goods. Internal trade is mostly in agricultural products. Further, good crops implying large purchasing power with the farmers lead to greater demand for manufactures and therefore, better prices. In other words, prosperity of the farmers is also the prosperity of industries. Likewise, bad crops lead to a depression in business. Generally, it is the failure in the agricultural front that has led to failure of economic planning. Finally, finances of the Government especially, of the state Governments, depend, to a large extent, upon the prosperity of agriculture. It is clear, therefore, that agriculture is the backbone of the Indian economy and prosperity of agriculture can also largely stand for the prosperity of the Indian economy.

1.4 AGRICULTURAL DEVELOPMENT IN INDIA:

With the introduction of economic planning in 1950-51 and with the
During 1995-96 one crores fifty seven metric tonne's fertilizers was used in India. Consumption of fertilizers in India per hectare was 70 kgs in 1995-96. The Corresponding figures for some developed countries were: South Korea (400 kgs), Netherland (275 kgs), Belgium (225 kgs), Japan (340 Kgs.) Despite significant improvement since 1950-51, per hectare fertilizer consumption is still very low in India.

Planning commission specified the various programmes for increasing agricultural production such as irrigation soil conservation, dry farming and land reclamation supply of fertilizers and manures, better ploughs, and improved agricultural implements, adoption of scientific practices etc. During the First Plan Rs. 600 crores were allotted to agriculture and irrigation in India, while during Seventh Five Year plan Rs. 93,680 crores were allotted to agriculture and irrigation. However, the percentage of the outlay was the highest in the First Plan viz. 31 percent and was between 20 to 24 percent in all other plans. India has made agricultural progress through five year plans.

The increasing pressure of population on land and rapid industrial development demand greater agricultural production in the country. Agricultural Land is very limited resource where as it still plays a significant role in the economy of the country. The greatest problem before India is the decreasing man land ratio. In such a critical condition land must be properly surveyed and used intensively to its full capacity to maintain the balance between demand and supply of the growing population.
1.5 CHOICE OF THE REGION AND TOPIC:

The choice of the area and the topic under investigation has been influenced by several considerations. Firstly, Maharashtra state comprising the 31 districts of Indian Sub-continent has significant location on Indian plateau. Physically, the state comprises three natural divisions. The narrow coastal lowland of Konkan the Sahyadries and the Deccan Plateau Geologically the area of the state nearly coincides with the limits of the Deccan Trap formations. The sahyadris, or western ghats, Mahadeo range, Harichandraghat, Balaghat are not useful for agricultural activities. The river basins viz. Godavari, Tapi-Purna, Bhima, Panchaganga, Wainganga, Painganga etc. are useful for agricultural activities. Agricultural activities are mainly concentrated in river valleys and on the plateau.

Secondly, scarcity zone comprises of 87 tahsils of 14 districts out of 31 districts of the state. The scarcity zone suffers from twin problems of low productivity and high instability. As a result, the agriculture in this region is most unstable coupled with low productivity. These areas are the most vulnerable to aberrant weather conditions. The occurrence of draught is noted once in three years. Therefore, the author has selected this region for the investigation.

Thirdly, this region has shallow black, medium black, deep black, laterite, coastal saline, coastal alluvial, saline alkali, mixed red and Black, red loamy, red and yellow soils. Agricultural activities are mainly concentrated in black
soil regions.

Fourthly, out of the total geographical area about 65.05 percent area was agricultural land during 1993-94 but only 58.87% area was under cultivation. It means that there is a scope to increase agricultural land in the region. The pressure of population on agricultural land was more in 1991. During 1991 the per capita cultivated land was only 0.23 hectare. It varies from district to district.

There is regional imbalances in the study region. Pune and Kolhapur Divisions have made remarkable agricultural progress in the state of Maharashtra, Konkan, Nagpur, Aurangabad and Amravati divisions are comparatively backward in the agricultural development. The regional imbalance is also found it use of chemical fertilizer, irrigation, mechanization of agriculture, use of pesticides, use of Have seeds, and methods of cultivation.

It is felt that study of the systems of agricultural production offers a helpful approach to obtaining a more complete understanding of the problems of agriculture in a region. Moreover, the composite circumstances that contribute to the exiting problems facing agricultural activities today have a time and space perspective that may be appreciated.

All these considerations motivated the author to turn his attention to this region and its agricultural geography.
1.6 AIMS AND OBJECTIONS OF THE PRESENT STUDY:

The specific objectives of the present study are:

1) To study the availability of infra-structural and geographical factors on which the development and growth of agriculture depend.

2) To study the population characteristics and its effect on agriculture.

3) To analyse and map the spatio-temporal distribution of irrigation facilities and its effect on cropping pattern.

4) To assess the affect of use of mechanical and bio-chemical inputs on agriculture.

5) To study the general and agricultural landuse and its variation in the region.

6) To assess the trends of production and yield in the study region.

7) To find out agricultural productivity and its variation in the state.

8) To divide the state into various agricultural regions.

9) To find out the agricultural problems and suggest suitable remedies
to solve them.

1.7 DATA BASE AND METHODOLOGY :-

As this work bas to be done single handily, Author hope the readers will take into consideration its limitations. The data collected and used for the period to 1970-71 to 1994-95 comes from secondary source. The broad picture of present pattern of land utilization, cropping pattern, trends of production and yield is prepared with the help of secondary, data obtained from Socio-Economic Review, districtwise census handbook, gazetteers, districtwise agricultural statistical Information of Maharasthra part I & II, periodical and season and crop reports published by the department of agriculture.

The data thus collected through secondary source, were processed and represented by statistical and cartographic techniques. As the study purports to be geographical in spirit the chorographic and chorologic methodologies have been adopted. These involve the description and interpretation of the regional patterns revealed through Choropleth Method. For studying the pressure of population on agricultural land, various land densities, such as crude density, rural density, physiological density, agricultural density, nutritional density and caloric densities are computed.

These densities are computed by using variables viz. area and population. For measuring the actual pressure of population on agricultural
land the relative co-efficient values of over population are computed by taking into consideration the standard hectares namely 0.4047 hectares. Using this as a criteria, the relative co-efficient of over population is computed by dividing the unit of 0.4047 of a hectares by per capita land.

For studying the changes in landuse patterns, five measure land use categories viz. area under forest, area not available for cultivation, other uncultivable land excluding fallow land, fallow land and net sown area are considered. In order to smooth but unusual fluctuations five years average data for the years 1970-75 and 1990-95 are used. Percentage of area under each category of land to the geographical area is computed. For studying the land use efficiency the index of land use efficiency is calculated by dividing gross cropped area by net sown area into hundred.

For studying the changes in cropping pattern annual area variation of agricultural crops are calculated only for the region. To study the changes in cropping pattern in the state the five yearly moving averages are considered. The quinquennial average area under different crops and the relative share of each crop in gross cropped area has been deployed for the study of cropping pattern in the study region. The indices numbers of area of the agricultural crops are calculated by selecting 1970-71 as a base year for the study of trends of area under different crops in the state. District level trends in area under different crop are also studied. For the study of trends in area at district level the five years average data for the in years
1.8 REVIEW OF LITERATURE :-

Majid Hussein (1669)\textsuperscript{16} studied the geographical basis of tubewell irrigation in the upper Ganga Yamuna Doab. In this paper the geographical factors helpful in the drilling of tube wells in the area have been assessed and the effect of tube well irrigation on the changes in the land use patterns have been shown. The paper includes four maps, showing the surface configuration of the areas and the area under commands of canals and tube wells. The proportion of the cropped land irrigated by tube wells have been depicted in map. The study can be utilized for the further extension of canals and small irrigation projects in the area.

Ali Mohammed (1995)\textsuperscript{17} :

Studied Agricultural land use 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 (Physical, climate, soil) of the region with a view brining out the extent of influence of these factors on the existing crop-land use. A Study has also been made on spatial patterns of agneral land use, agricultural land use and crop combination regions. The principles of the selection of villages for intensive study of land use and pressure of population have been logically discussed in one chapter. The entire area has been divided into five homogeneous strata and representative villages have been slected from each stratum on the basic
of the systematic purposive cluster sampling. Part II which is entirely based on field work includes the study of land utilization and pressure of population in the twelve selected villages of the region. A certain classifications about the selected villages has been studied. A detailed account of the custing land use 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 deficiency or surplus of these elements and the resulting nutritional deficiency, diseases. The work is based on a direct survey of the sample households chosen on the basis of the economic strata of the household. The work provides a few suggestions for the future development of agriculture and standard of living in the region as in all the villages unbalanced nutritions has played an adverse role to bring about numerous among the rural population and measure lies in the improvement in agricultural production.

P. C. Vats\textsuperscript{19} (1977) :

Examined Influence of macro geomorphological units on land use and crop production, a case study of village Dundli. The study was conducted
with the help of aerial photographs of 1:2500 scale toposheet of 1:63,360 scale and by the subsequent detailed field surveys. The Land utilization data and the village maps were collected from the revenue record. A number of soil samples from each geomorphic units were collected and analyzed to determine the physical potentialities and limitations of each unit. Relationship between land forms and land use also established.

On the basis of field survey, it was concluded that geomorphology which controls the distribution of soils, surface and surface water, vegetation and cropping pattern has influenced the crop production. Author found that crop production of Dundli 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 pan at shallow depth, shallow granite rock (weathered at top) mineralized, groundwater, wind erosion and depositional hazards.

Daya Ram (1977)\textsuperscript{19}:

Analyzed 'Relationship of rainfall, water balance and crop maturity in western Haryana. The secondary data was used for the study. Author has calculated correlation coefficient of seasonal rainfall and crop maturity, relative variability, correlation coefficient of monthly rainfall and crop maturity, correlation coefficient of seasonal water balance and crop maturity and correlation coefficient of monthly water balance and crop, maturity for the study area. He found that the realiability of crop maturity on rainfall was
more in the rabi season then in the kharif season. Author observed that the seasonal water balance was more suitable for maturity of bajare and clusterbean than cotton deshi in kharif season. In the rabi season, it was more suitable for maturity of mustard and taramira than gram during the period of investigation. The crop maturity seems to be directly related not only to the seasonal rainfall but also rainfall and water balance in certain months of the related harvested season.


Studied crop concentration in Karimnagar district Andhra Pradesh emerging problems. The study tries to focus on the problems of changing scene in respect of crop concentration for the two points of time i.e. 1973-74 and 1979-80. The data has been collected mainly from bureau of Economics and statistics Government of Andhra Pradesh for individual talukas of the district from two points of time i.e. 1973-74 and 1979-80. Author has converted data into percentages for meaningful comparisons. He used Bhatia’a Method for computing crop concentration index.

He found very light concentration of rice in metapally, sircilla and Karimnagar talukas during 1973-74. During 1973-74 out of the seven talukas except peddapally and Manthani where green grass and jowar respectively were dominant crops, in the remaining talukas rice occupied a very important position comparatively to other crops.
T. C. Sharma and O. Coutinno (1983) 20:

Analyzed growth of irrigation and its impact on crop landuse and crop yield in Karnataka (1960-61 to 1976-77). The chief objectives of the study were (i) to measure the growth of the irrigated area and its components. (ii) to measure the changes in the crop land use, cropping patterns and growth in yields and (iii) to measure and explain the impact of irrigation on crop yield. They used secondary data of irrigation and cropping pattern for the period of 1960-61 to 1976-77. To measure the growth in the irrigated area and crop productivity compound growth rate was calculated by the author. They have also calculated coefficient of variability, correlation for the study region.

The Study indicates that the bulk of the created potential in irrigation has been used by farmers for raising a few intensively irrigated crops and has led to multiple cropping in any significant measure. Shift in favor of high prdutivity irrigated crops like maize, wheat, sugarcane and paddy were common in all irrigated tracts in the state. Low yield crops like jowar, pulses and oil seeds have lost heavily. Unless their yield rates improve these crops may be eliminated from the cropping patterns in the coming years in the irrigated tracts. Productivity has considerably gone up in the state in several irrigated and unirrigated crops particularly cereals and sugarcane in most of which it was above the national average during the period of investigation. Increased irrigation seems to have played a key role in rising it in many
crops particularly paddy, maize, wheat and sugarcane.

The weather influenced annual fluctuations in the yields were also considerably lower in the irrigated crops. In most of the rainfed crops the yield rates were low and highly fluctuating due to weather vagaries.

V. S. Datye and S. C. Gupta (1984) 21:

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 in Poona district. In order to investigate the association between land use types on the one hand and hysio cultural elements on the other. The fourteen variable like net sown area, gross cropped area, rice, jowar, bajara cash crops irrigated area, accessibility owner cultivators, density of population, slope less than 3°, slope greater than 2°, distance from the crest and distance from major streams were used as dependent and in dependent variables. First seven variables were used as dependent and next seven variables used as independent variables.

The relationship were studied and analysed applying quantitative techniques like simple correlation multiple regression and principal component analysis. The correlation analysis brings out clearly the importance of physical factors like slope and distance of physical factors
like slope and distance from crest (rainfall) and economic factor like irrigation and accessibility as major factors influencing the land use pattern.

**M. Shafi (1985)**:

Studied, farm power and productivity in Indian agriculture. The paper makes an attempt to examine the productivity of Indian agriculture, deviating from transitional approach of yield per unit area, per unit worker or in terms of monetary or caloric value. It aims to judge the productivity of Indian agriculture in terms of farm power and points out that half the energy in Indian agriculture was supplied by draught animals. Power supplied by human labour was one tenth and only forty percent of the power comes from tractors, pumps and machinery during 1970-71.

The paper examines the areal distribution of the total power availability in Indian agriculture and concludes by pointing out that it was not correct to think that with every increase in h/p, yield to h/p ratio will increase. It finally refers to the picture that may emerge irrespect of power in agriculture in the country when it enters the 21st century.

**V. Vidyanath (1985)**:

Examined crop productivity in relation to crop land in Andhra Pradesh a spatial analysis. Author has considered district wise gross cropped area in hectare, gross irrigated area and total production of crops in metric tonne's for the study. Author has considered 1980-81 data for the study. He has
used Bhati’s (1967) and Jasbir Signh (1976) methods for the calculation crop productivity in Andhra Prudish. Author found very high crop productivity in the coasted districts of Visakhapatanam, East and West Godavari and Nizamabad districts. This high product was due to high fertility of alluvial and red soils, intensive cultivation and assured water supply due to canal irrigation.

Besides these four district, with very high crop productivity, three districts, Krishna, Chittoor, Medak showed high productivity. Eight districts like Guntur Shrikakulam, Vizanagaram, Nellore, Cuddapah, Karimnagar, Warangal, Rangreddy showed medium crop productitity. Low crop productivity was noticed in the remaining district viz. Mahboobnagar Kurnool, Ananthpur, Prakasam, Nalgonda, Khammam, Adilabad and Hyderabad. Due to the low rainfall, irrigation, facilitites were very poor. In most of the districts, the percentage of gross irrigated area to gross cropped area was less than 20%. Thus, the spatial pattern of crop production in relation to crop land area in Andhra Prudish was largely influenced by soil fertility, rainfall and irrigation.

Sharma T. S. and O Coutinho (1985)²⁴ :

Examined Disparities in production in Utter Prudish spatio temporal analysis. In this study an attempt has been made : (1) to analyses emperically the growth of foodgrains production since 1966-67. (2) to decompose the components of production increase between 1966-67 and 1980-81. (3) to
measure the yield variation over time and space. 4) to measure the yield gap between the various levels of practice and the correlate the gap with certain well-known controls for 1980-81 in the state of Uttar Pradesh to focus in the yield disparity and potential available in two state. Author used data of foodgrains for the period of 1966-67 to 1980-81.

Author has calculated indices, compound growth rate to analyse the disparities in foodgrains production in Uttar Pradesh. He has also used multiple regression technique for the study.

The study reveals that almost the entire increase in foodgrains production Uttar Pradesh took place due to rise in yields of cereals. The pulses area declined sharply and it was chiefly responsible for the decline in their production. It shows that the yields in the southern and eastern districts had not increased much and still remain at a very low level. The yield rate in the western and north-western district had on the contrary risen very sharply. As a result, the disparity in the yields was greater than in the mid sixties. indicating that the new farm technology had little impact on the agriculture in the former area and that it had widened the development gap between these regions. The study indicates that a certain amount of break through was evident in all parts of the state but non-availability of irrigation acts as severe constraint and unless this impediment was removed many parts of the state particularly in entire Bundelkhand and many districts of Gorakhpur, Faizabad, Varanasi and Lucknow divisions would not be able
to realise the huge yield potential which remain untapped. A large area was still covered under low yield coarse grains and pulses in these parts and their yield rates, even in wheet and paddy were low during the period of investigation:

The study also shows that unless the yields improve, pulses crops would be eliminated from the states cropping patterns in the years to come.

S. K. Sharma and Ajitkumar Jain (1988)25:

Examined Diffusion of innovations in the cotton growing tract of Madhya Pradesh. A case of pesticides. The study was based on farm survey in four districts viz. Khargone, Khandwa, Dhar and Ratlam of the western Madhya Pradesh. Agriculture in this part was comparatively developed and was commercialized. More than one-third of the total cropped area was under non food crops in these districts and more than half (53.6%) of this area was devoted to cotton during the period of investigation. The study on diffusion of innovations was entirely based on the first hand information collected through the structural questionarie and interview method. Unlike fertilizers and HYV, pesticides were sold in towns only. 27 villages were selected for the study.

This survey of cotton growers of the western Madhya Pradesh shows that the knowledge of agricultural innovation had percolated to them. But the channels of arrival of this knowledge and the extent of its utilization
very widely. The size of land holdings had been major determinant. Author found that the improved seeds were brought to the farmers by the Government extension department and also by co-operative societies. But case of pesticides was quite different. Dealers of these chemical had came forward as major source of knowledge about pesticides. At the same time, significance of companion leaders and of governmental agencies declines remarkably.

P. D. Tiwari, (1988)²⁶:

Studies A Geographical analysis of the calories available from different crops in Madhya Pradesh. His main objectives were i) to analyse the item wise share of calories, 2) to analyse the caloric availability of the area and 3) to classify the districts into deficit/surplus categories.

On the basis of the total produce available for consumption and the total population dependent on this produce, food balance sheets have been prepared of each district in order to asses the per capita food production availability and caloric availability in the area under study.

Author observed medium surplus calories in Madhya Bharat Plateau. Low surplus calories was found in Morena, Bhind, Balaghat, Tikamgarh and Chatarpur districts. Low deficit categories was noticed in chattisgarh basin, Bundelkhand upland Malwa Plateau and Central Narmada basin. High deficit categories was observed in Durg, Sagar, Damoh, Rewa, Sidhi,
Mandsour, Guna, Dhar and Mandale, while very high deficit categories (31%) was recorded in Betul, Chhindwara plateau all, the Malwa plateau the Narmada basin. The entire Betul, Chhindwara plateau and western tribal Zone of Narmada basin recorded very high deficit availability of calorie. Author concluded that there are many ways of increasing the nutritional level of the study region. Such as 1) by suitable change in the cropping pattern. 2) by increasing the crop yields, 3) extending the area under crops. 4) by reducing losses, 5) by nutritional education programmer etc.

Rameshwar Thakur (1989)27:

Studied, A Agricultural productivity in south Bighar Plain: A spatial analysis. Author selected 146 Anchals from south Bihar plain for measurement of agricultural productivity. Secondary data was used for the study. The nature of agricultural output was based on 16 major crops: rice, wheat, maize, ragi, gran, tur, rapeseed, mustard, sesamum, tisi, khesari, urad, moong, lentil, sugarcane potato and onion. Together these account for more than 80 percent of the total cropped area. Author has used Husain's and Enyedi's Method for the calculation of agricultural productivity. He found high productivity in 31 Anchals, moderate in 60 Anchals, low productivity in 28 anchals, very low in 20 Anchals and extremely low productivity in 7 Anchals.

This paper has examined the regional variations in land productivity in south Bihar. To increase agricultural productivity over large areas in south
Bihar plain author suggested some remedies. Firstly, there is an urgent need for expanding irrigation resources and fertilizer supply and improving capital or credit facilities in order to allow small farmers to benefit from the availability of physical inputs. Secondly, there is a desperate need for a transfer of population from agriculture to non agricultural activities. Thirdly, the significance of urban industrial development in this analysis, suggests that a decentralised policy of urban industrial development will benefit agriculture.

A. KRISHNAKUMARI AND E. SWAMI-NATHAN (1973)²⁸:

Examined Levels of agricultural modernization in Nellore district Andhra Pradesh. In this study an attempt has been made to bring out the level of modernization among farmers and its spatial variation in Nellore district of Andhra Pradesh. This study was based on primary and secondary data collected from 11 villages. Choosing 20 farmers in each village drawn from all the size farmers. In the first instance an attempt was made to establish the empirical relationship among the parameters of agricultural modernization by multiple correlation. This formed the basis for factor analysis, which in turn bring out the underlying dimensions among 25 variables on the basis of association among the modernization variables in the nine talukas of Nellore district in order to bring out the spatial patterns of levels of modernization, Factor scores were computed and was subjected to cluster analysis to group the 9 talukas of Nellore district.

The high level of modernization was found in Nellore, Kovur, kavali,
Venkatagiri and Rapur talukas. In Sullurpet and Udayagiri taluka the level of modernization was moderate. In rest of the talukas such as Gudur, and Atmaker the level of agricultural modernization was identified to be low. It may be concluded that due to the diversity in physical, social, economic and institutional factors, the farming activities and ultimate outputs were not uniform within the district. Further, because of the differences in the awareness, availability of the modern inputs of agriculture, the spatial variations were surfacing up. The study has clearly brought out the spatial patterns of levels of agricultural modernization in Nellore district. The factor and cluster analysis are extremely helpful to discover the dimensions and group the talukas according to their level.

Praveen Saptarshi, Parkhe Gulab Rao (1993):

Examined correlation between sugarcane and other crops in Junnar tahsil: A micro level study. Author’s were used secondary data for the period of 1980-81 to 1989-90. They have calculated correlation and regression between sugarcane and other crops like jowar, bajara, rice, wheat, pulses, fodder crops and oil seeds. It was attempted in the paper to, analyse the impact of spatial growth of sugarcane cultivation in the Junnar tahsil of Pune district (M.S.) Author’s found that area under sugarcane has increased from 1980-81 to 1989-90 and due to the increase in area under sugar cane agricultural cropping pattern has shown greater change.

Nandani Chatterjee (1995):

Studied, irrigated Agriculture: A case study of West Bengal. Author has collected official as well as field survey data. The main objectives of the studies were 1) to highlight the basic problems that have made irrigation a necessity, 2) to assess the physical setting of irrigation by a detailed appraisal of the surface and groundwater resources as well as their influence on the types of irrigation in the state. 3) to assess the impact of irrigation on land use cropping intensity cropping pattern as well as on agriculture efficiency by macro land micro level analysis. Author has used Linear regression technique for calculating trends and probability of rainfall in West Bengal. Impact of irrigation on land use cropping intensity and crop yields have been depicted by the Pearsonian correlation coefficient. She used wilconxon ranked pair test to test the significance or change between 1960 to 1980. Nandani Chatterjee has not only carried out a compressive study of the irritated farming now practiced in West Bengal but also undertaken in depth analysis of irrigated agriculture in selected villages of the state. The researcher has considered the problems not only from the physical point of view but also assessed the socio-economic aspects of the problem.

Author found that the irrigation potential of West Bengal was not fully utilised. During the period of investigation only 36 percent of gross cropped area was availing irrigation facilities. Author has pointed out that the growth rate of irrigation during the period of 1995 was somewhat sluggish.

1.9 CHAPTER SCHEME:
The present study is divided into eight chapters. In first chapter, meaning of agriculture and agriculture Geography, significance of the study agricultural geography, the place agriculture in Indian economy, agricultural development in India, choice of the region and topic, aims and objectives, Data base and methodology, review of literature and chapter scheme are presented.

Chapter second deals with location, boundaries of the study region, historical background, physionographic characteristics, drainage, climate, soils and natural vegetation.

Third Chapter throws light on irrigation, population, livestock, agricultural implement use of chemical fertilizers, use of high yielding varieties, pesticides, agricultural finance, marketing, transport and communication from the view point of their suitability for the development of agriculture.

Chapter fourth is devoted for the study of general land use in Maharashtra state. In this chapter an attempt in made to study the concept of land use, classification of land use, trends in land use pattern, districtwise per capita net sown area in the region, volume of change in land use categories and index of land use efficiency.

Chapter fifth deals with annual area variation of agricultural crops, index numbers of area of selected agricultural crops, changing cropping pattern from 1970-71 to 1994-95, districtwise and divisionwise trends in area under
different crops, crop combination, crop concentration and crop diversification in the study region.

Chapter sixth throws light on growth of production in the region, district and divisionwise and yield, variability in yields, trends of yield of selected crops, crop productivity and overall productivity.

Chapter seventh deals with the agricultural development during Five Year Plans and agricultural developmental regions of the study area.

Chapter eight covers conclusions, agricultural problems of the study region and specific suggestion to solve the problems.

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REFERENCE:


5. Ibid P. 4,7.


