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Chapter I

APPRaisal OF THE PROBLEM

1.1 INTRODUCTION

Agriculture is one of the oldest and prime activities of the human being. It has remained an important source of food. In spite of growing industrialization and urbanization in the world, nearly fifty per cent working population still engaged in agriculture. In developing countries agriculture sector has been a major source of employment and contributed to the national economy.

The word agriculture is derived from the Latin ward ‘ager’ means the land or field and ‘cultra’ means cultivation; it means the science and art of producing crops and livestock for economic purpose. Agriculture is an art of raising plant life from the soil for the use of mankind. The basic aim of agriculture is to raise stronger and more fruitful crops and plants and to help them for their growth by improving the soil and supplying the water. Agriculture is the milestone in the history of human civilization, due to agriculture man settled at a particular place.

Agriculture is a backbone of Indian economy. In India, near about fifty seven per cent of the total population is dependent on agriculture for their livelihood. Despite of technological advancement and conquest over nature, the agricultural activities in the world are closely controlled by physical factors. Indian agriculture is not an exception for this; today India is facing two main problems concerned with agriculture. The first is meeting the increasing demand of food and other is supplying agro products for ever increasing population and the second is uneven development of agriculture and changing pattern of agricultural land use. India tried to be self sufficient in agriculture through five year plans after independence by taking systematic efforts. Due to the unique importance, agriculture gets more and more attention in every five
year plans and top priority is given for the development of agriculture in our country.

As land is one of the important constituents of agriculture, the study of land and agriculture from the geographical point of view gained more importance after 1950. At the beginning of 1970 and later on the Green Revolution brought a remarkable change in the field of agriculture. Due to this, India became not only self sufficient in food grains but it could also export a small quantity of it. The green revolution also known as the HYV revolution, strengthen the Indian agriculture.

Even then, the process of agricultural development is not properly channelized because of uneven rainfall, unavailability of basic infrastructure facilities and unbalance allocation of resources. The green revolution is succeeded only in the areas of irrigation. In spite of lot of efforts by government, the small farmers could not get the benefit of it. This creates a large gap between small and big farmers and imbalance is created. To reduce this gap, systematic planning is required. For this purpose, it is necessary to have the detailed information of the region. The research in agricultural geography in the region can be useful to solve the problems of the region and helpful in planning for agricultural development. The present exposition has an attempt to study the Raigarh district for the better planning and development of agriculture.

1.2 SELECTION AND JUSTIFICATION OF THE TOPIC AND REGION

The selection of topic and region is influenced by different considerations. Firstly, the study relates to region, popularly known as Konkan, consists of Thane, Mumbai, Raigarh, Ratnagiri and Sindhudurg districts. Geographically all the districts are synonymous to each other, to insert the accuracy and objectivity in the study, the study is restricted to Raigarh district of Konkan region only. This region has not been studied in-depth by any
researcher from the agricultural point of view. Secondly, this region remains still untouched for land use planning and development. The review of literature, on the aspects of land use and land degradation reveals that there is no empirical study has been done based on secondary data related to Raigarh district. Geographically, Raigarh district has unique features to study, just as the wide range of variables like change in agricultural land use and agricultural land degradation. Therefore Raigarh district is selected as a base of study. Thirdly, the researcher has an association of the study area since long, as he is working in this region. This has motivated researcher to undertake the study.

1.3 REVIEW OF THE LITERATURE

There was lot of work done by various geographers on land use in the world mostly in 20th century. The beginning of land use studies and survey may trace to the regional survey where it is a purely general academic interest. The idea of map showing the use of land was mooted by Carl O Souer (1919). The trace of brief history of the land use studies initiated in Great Britain. The first land use survey and mapping is carried out by Patrick Geddis but the practical work on land use study was carried by Stamp L. D. in 1930 in Britain. A scheme covering the whole Great Britain was successfully accomplished in 1930 and the field work begins in 1931. Stamp L. D. done the work entitled “The Land Use of Britain: Its Use and Misuse.” After his pioneer work the survey of land later on adopted by many geographers and economists. The work done by Taylor (1930), Baker (1933), Hartshone (1935), Wittelsey (1936), Weaver (1954), Coleman (1960), Shafi (1960), Choppock (1964), Mohamad Ali (1967) were concentrated on land use survey. Baker (1929) published several articles in ‘Economic Geography’ a Geography Journal and one of his famous articles entitled as “Land Utilization in United States: Geographical Aspects of the Problem.” The concept of land use planning of the country was put forth by Department of Agriculture, United States (Arthur Hillman, 1957). In a similar way Choppock wrote on Agricultural Geography
of tropical Africa, Jonson (1958) wrote on Agricultural Regions of Europe, Taylor (1930) wrote on Agricultural Regions of Australia and Jones (1966) wrote on Agricultural Regions of South America. In 1929, Whittelsey divided the world into major agricultural regions. Enyedi, G.Y. (1964) worked on “Geographical Type of Agriculture”. These studies clearly indicate that most of the geographers were interested in large areas; some of them have selected whole earth while some has selected the continents for their studies.

Notable studies in the agricultural land use was done by Indian geographers mostly after 1950. Chatterjee S. P. (1940) emphasizes the need of land use survey in India. Aligarh Muslim University, Utter Pradesh, Banaras Hindu University, Banaras, Sagar University-Madhya Pradesh, Patna University, Delhi University, Calcutta University and Punjab University carried out the notable work in Agricultural Geography. Shafi M. (1951) is the pioneer geographer who carried the work of systematic sampling method. He carried out the sample study of land use of twelve villages and published the findings in ‘The Geographer’ and also completed the work on ‘Pattern of Cropland Use in Ganga-Yamuna Doab,’ Chatterjee S. P. (1952) demonstrated his work as ‘Land Utilization in Hawarha District’, Mishra S. (1964) attempted the work on ‘Land Use in Khadar and Raviness of Lower Middle Gomati Valley’, Chavhan D.S. (1966) carried out the work on ‘The Studies in Land Utilization of Agriculture’, Siddiqui and A. Ahmad (1967) have studied the ‘Cropland Use in the Luni Basin’, K. Z. Amani (1968) worked on ‘Agricultural Land Use and Crop Production in Harnarayanpur and Golghari Villages in Aligarh District’ for the period of forty years., A. N. Raina (1971) made an attempt to present basic factors affecting on types of land use in floating garden blocks of the Kashmir valley and Jasbir Singh (1971) dealt with ‘Optimum Carrying Capacity of the Land in Punjab’.

Apart from this, geographers have also done their work in the State of Maharashtra. Shivaji University - Kolhapur, Pune University, Nagpur University and Dr. Babasaheb Ambedkar Marathwada University- Aurangabad

Although several studies on agricultural land use are available, there is very limited published material available on land degradation. At global level, it was Rauschkolb (1972) who presented his views on land degradation at Stockholm Conference which attracted the attention of geographers. Russell (1972) discussed the effects of agricultural land use, through intensive fertilization on human environment. Eckholm (1976) considered the impact of land degradation, cautioning that the poorest countries would suffer the most. Winfred (1997) highlighted on methods of assessment of soil degradation. Vink (1983) examined erosion and landslides, salinasation, water logging and sedimentation as the dangers provoked by irrigation.

1.4 CONCEPTUAL BACKGROUND

1.4.1 Land Use

The term land use is virtually self-explanatory meaning the actual and specific use to which the land surface is put to in terms of inherent primary land use namely, land under forest, pasture, cultivation etc. “Land use means
surface utilization of all developed and vacant lands for a specific point at a
given time and space (Foreman T.W.-1968). Land is controlled by climatic
factors, soil characteristic slope of land degree of erosion, drainage and other
environmental factors. The use of land changes according to the changing
needs of man. Lands are used for forest, pastures, transportation, and
settlement, industrial and commercial purposes. Whereas, uncultivable waste
land, barren and fallow land are unused lands.

Government of India has now officially classified land under following
categories like a) Reported area for land cultivation purposes, b) Forests. c)
Barren and uncultivable land, d) Land put to non-agricultural uses, i)
Culturable waste, ii) Permanent pasture and other grazing land, e) Land under
miscellaneous trees, crops and groves not included in net area sown, i) Current
fallow ii) Other fallow land, f) Net sown area, g) Area sown more than once
and h) Total cropped area. These twelve categories and finally grouped into
five classes such as a) Forest land, b) Net sown area, c) Land not available for
cultivation, d) Cultivable waste and e) Fallow land.

1.4.2 Crop Productivity

The term agricultural “productivity” is defined it regarded as a ratio of
the output to input in relation to land, labour, capital and overall resources
employed in agriculture. Rao (1962) and Jasbir Singh (1981) considered
agricultural productivity as the degree of which the economic, cultural,
technical and organizational variables (i.e the man-made frame) are able to
exploit the abiotic resources of the area for agricultural production. Bhatia
(1967) defined agricultural efficiency as the aggregate performance of various
crops in regard to their output per acre but the contribution of each crop to the
agricultural efficiency would be related to its share of the crop land. Singh
(1976) defined agricultural productivity as the quantity of return from arable
land. He argued that quantity of production denotes its intensity and the spatial
expansion.
The crop productivity is manifestation of the influence of various factors including the physical factors like relief, climate and soil. Socio-economic factors like size of the operational holding, occupational structure of population, the type of farming and tendency of farmers and technical and organization factors like crop rotation, irrigation and mechanization) also influence crop productivity (Bhatia, 1968).

### 1.4.3 Land Degradation

Land degradation is a comprehensive term often used to denote the decrease in biological productivity, fertility status and property of land in general. The term degradation as used in geomorphology, indicating disintegration or decomposition of rock material is loosely used to denote deterioration of the status of the environment. Whittos (1984) stated that, ‘the process, by which soil becomes weathered or more highly leached, denotes degradation’. According to Oxford English Dictionary, degradation is, ‘a condition of being lowered of lowering in character, quality of reduction to an inferior state or a conversion into lower form’. These definitions can note that the degraded lands or surfaces have lowered quality, character, grade and properties due to wearing down of original qualities.

More precisely, land degradation refers to the disturbances in the natural structure and properties of soils due to direct or indirect anthropogenic (human) influences. Ministry of Food and Agriculture, Government of India (1962) defined this term as, ‘the land available for cultivation but not taken up for cultivation or abandoned after a few years for some reason or other’. To conclude, a piece of land which is not being utilized at present, in any manner may be called a degraded land and includes the lands which are left fallow over a period of time and unutilized, underutilized for cultivation of any crop or plant due to various constraints.
1.5 OBJECTIVES

To make an in depth and comprehensive study, the following objectives are selected -

1. To study the geographical setting of the region.
2. To analyze the spatio-temporal land use pattern in the study region.
3. To examine spatio-temporal changes in agricultural land use in the study region.
4. To delimit and to analyze the agricultural regions of the study region on the basis of crop ranking, crop combination and crop diversification.
5. To study the crop productivity of the study region.
6. To study the locational aspects of land degradation and analyze the land degradation of the study region.
7. To study the land use and land degradation in selected sample villages.
8. To suggest remedial measures for the better agricultural planning and development of Raigarh district.

1.6 DATA BASE AND METHODOLOGY

The entire research work is based on primary and secondary sources.


1.6.2 Primary data have obtained for ten sample villages through questionnaires. The systematic purposive sampling was chosen for selecting the
sample villages. The questionnaire covers the aspects like general land use, crop land use, farmer’s cultivation methods, use of fertilizers, education, income, problems related to agriculture. Besides this another questionnaire is filled from concerned Talathi, Gramsevak and the Sarpanch of the villages to get more information of sample villages.

1.6.3 Methodology The data collected is analyzed by applying different suitable statistical methods and is presented through tables, maps, and diagrams. The spatial and temporal aspects of general and agricultural land use were studied in detail. The data obtained for the period of 1980-81 and 2000-01 converted to the percentage to the total geographical area. To avoid the fluctuations, three years data is averaged and used for analysis. The percentage is categorised in different groups. The volume of change of these categories for twenty years was computed and mapped. Suitable diagrams were made and interpreted the text to show the land use pattern.

For the calculation of crop combination of the region, Rafiullah’s maximum positive deviation method is used. Rafiullah (1956), based on Weaver’s method, developed a new deviation method in his work ‘A New Approach to the Functional Classification of Towns’ (Hussein, M. 2002). The technique devised by Rafiullah may be expressed as follows:

\[
d = \frac{\sum d^2p - \sum d^2n}{N^2}
\]

Where,

\[d\] = is the deviation between actual crop percentage and the appropriate crop percentage in theoretical distribution.

\[p\] = is the positive difference.

\[n\] = is the negative difference.

\[N\] = is the Number of the crops in the region.
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Year 1990-91 and 2000-01 is selected for the delineation of crop combination and eight crops are selected for delineation of crop combination.

For the assessing the crop productivity of the region, Enyedi’s formula is used. Enyedi, while describing geographical types of agriculture in Hungary refers to a formula for determining agricultural productivity. His formula for assessing productivity co-efficiency would be read as

\[
\text{Productivity Index} = \frac{Y}{Y_n} \div \frac{T}{T_n} \times 100
\]

Where

- \(Y\) = Production of the respective crop in the unit area.
- \(Y_n\) = Total production of the crop in entire region.
- \(T\) = Area under selected crop in a unit area
- \(T_n\) = Area under selected crop in entire region

For the computation of crop diversification of the region, Gibb’s Martin’s Index has been applied. The formula is as under:

\[
\text{Index of Diversification} = 1 - \frac{\sum X^2}{(\sum X)^2}
\]

Where \(X\) is the percentage of total cropped area occupied by each crop or hectareage under individual crop. If the total cultivated area in the region is devoted fully to single crop it showing the specialization and the index value will be zero (Singh, 1984).

The systematic purposive sampling was chosen for selecting the sample villages. The selection of these sample villages was based on geographical variation. Crop combination regions found in the district are also considered for selecting sampling village. Two villages from each geographical area were selected by considering the aspects like relief, rainfall, slope, irrigation,
population, etc. Temporal analysis of general land use and agricultural land use has been studied in detail for the period of twenty years (1990-1991 to 2009-2010). Spatial distribution for general land use and agricultural land use has been analysed for year 2009-10. Spatial analysis of agricultural land degradation for was also carried for same year to find out the problems of the agriculture in the villages.

1.7 LIMITATIONS OF THE STUDY

Researcher has faced certain limitations. These are -

1. The non-availability of data at certain places is a major constraint.
2. Non-availability of land degradation data of soil erosion at tahsil and village level.
3. Fragmentation of land is a major constraint to find out the boundaries of general and agricultural land use.

1.8 ORGANIZATION OF THE TEXT

The present research work has been organized into nine chapters.

First introductory chapter includes the introduction of research work, objectives of the study, review of literature, sources of data and methodology of the study.

Second chapter dealt with geographical profile of the study region in respect to location, physiography, geology, drainage, climate, soil, natural vegetation, land use, population, occupation and infrastructure facilities.

Chapter three presents the spatio-temporal analysis of general land use pattern and the volume of change from 1981 to 2001.

The chapter four deals with agricultural land use with their spatio temporal variations.

Chapter five studies crop region by applying the techniques like crop ranking, crop combination and crop diversification.
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The sixth chapter dealt with crop productivity of the study region.

The seventh chapter describes the locational aspect of land degradation and analysis of land degradation of the study region.

The chapter eight presents the intensive and detailed study of general land use, agricultural land use and land degradation of ten selected sample villages namely Kolve, Kharsai, Varse, Shrigaon, Wave Diwali, Shiloshi, Kadav, Tupgaon, Dhodhani and Warandh.

The last chapter i.e. chapter ninth is devoted for the conclusions and suggestions.
REFERENCES