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Chapter - I
INTRODUCTION

1.1 Introduction:

Agriculture is the main foundation of rural life. Most of the people of the villages ranging from 15 to 60 years of age are busy in agricultural activities. Rural society all over that, India is mainly composed of farmers and the main occupation of the members of the farmer’s family and of other families in agriculture. All primary activities, including agriculture, are affected significantly by the prevailing natural environmental conditions relief of the land, climate and the nature of soils are more important environmental factors affecting agriculture. Variations in the natural environmental condition make different areas suitable the various types of landuse, agricultural practices and cultivation of particular crops.

Agriculture is the main occupation in rural part of the district. greengram, bengalgram, sugarcane, paddy, groundnut, wheat, red gram and other agricultural crops and jowar remains the crop now the trend is changing towards sunflower.

The importance of agriculture in the economic development of any country rich or poor, is borne out by the fad that it is in the primary sector of the economy, which provides the basic ingredients necessary for the existence of mankind and also provide most of the raw materials which when necessities of the human race. About 70% of the working population is engaged in agricultural sector in India.

1.2 Meaning and scope of Agriculture Geography

Etymologically speaking, the word ‘Agriculture’ comes from a latin term ‘Agreculutura’ which has its origin in the words ‘agar’ 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 to produce crops’. As a science, Agricultural Geography is concerned with the formation and testing of hypothesis, interpretation of geographic distribution and location of various characteristics of agricultural activities on the surface of the earth, and measurement of geographic relationship.

Furthermore, as a science, it also seeks to identify, describe and classify the problem of agriculture against a geographical backdrop (Singh, 1948). 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 word ‘agriculture’ to cover both cropping and grazing. Humphreys American Peoples Encyclopedia (1965) mentions under the head ‘Agriculture’ the production of crops, livestock and their products. It is in such a broad context that the term is used here to include both rearing of animals and raising of crops with this definition in mind, there are certain diverse fields of endeavour other than growing of crops which may be included in any definition of agriculture.

Agricultural Geography, according to Hilman (1911) constitutes a comparative study of the agriculture of countries and continents.

Agricultural Geography is concerned with the spatial aspect of farm enterprises (crop and livestock) and farm operation alongwith exchange, trade and marketing of the agricultural products. It is a science of choice with a location aspect which knowledge of environment, biological and economic factors is necessary (Cahuvan 1977).

‘Agricultural’ in agricultural geography implies the subject matter and ‘Geography’ gives the way of viewing or investigation the subject matter. Agricultural geography thus means the ‘Geography of agricultural’.
Furthermore, 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 inter relationships as reflected spatially. In agricultural geography, facts are arranged in an orderly manner. Each investigation involves four stages: (i) identification (ii) collection of relevant data (iii) formulation of hypothesis, and (iv) testing and modification of the hypothesis to provide an adequate explanation (Coppock, 1969). Authors of the present study strongly feel that a fifth style, namely, the ‘formulation of generalization’ must be added to explain the different agricultural characteristics in various areas.

**Scope of Agricultural Geography:**

Agricultural geography is one of the most highly developed branches of geography of the twentieth century. A few decades ago, it was almost at the primitive stage of its development. In recent years, it has made considerable progress towards maturity as agricultural geographers have begun to treat data, concepts and interpretation quantitatively. It is now fully alive to the changing economic, social and political situations which have resulted from progress in science and technology. Its study is considered essential to fulfil man’s irresistible desire to know, understand and investigate the arrangement and distribution of agricultural phenomena at spatio-temporal scale (Singh, 1976).

Moreover, the emergence of agricultural geography as an independent distinct and a leading branch of modern geography is becoming a pivotal event in agricultural landuse planning and development, particularly for sustainability in rural systems.

The main objectives, i.e., the scope of the study of agricultural geography are (i) to explain now different kinds of agriculture are distributed over the earth and how these function in spatial arrangement,
(ii) to understand how particular type of agriculture has developed in particular areas and how these are similar to or different from farming in other areas, (iii) to analyze the operation of farming systems and the changes these undergo, (iv) to highlight in what direction and with what volume the changes in agriculture are taking place, (v) to demarcate the crop-production regions or the crop combination regions or the agricultural enterprise or the agricultural development regions, (vi) to measure and examine the level of differences between the regions, (vii) to identify weaker areas in terms of agricultural productivity, and (vii) to delimit the areas of agricultural stagnation or poverty, parity and prosperity. All these fall within the scope of agricultural geography.

1.3 Definitions and Basic Elements of Landuse:

So many geographers tried to give the definitions of landuse. Some of these are given below.

T.W. Freeman:

Landuse means surface utilization of all developed, vacant land for a specific point as a given time and space.

R.B. Mandal:

Landuse means the optimum use of every piece of land.

R.P. Sing:

Landuse related to conservation of land form one major use of another general use.

Basic Elements of Landuse:

There are so many basic elements of landuse those are given below.

A. Earth surface is fixed and cannot be extended as a elastic materials:

When man tried to work on landuse, at that time he must have to take into mind that the surface of area of earth is fixed and man must be
unable to stretch or extend it as an elastic rubber so he has to make landuse to taking into consider those things.

B. **Landuse is the product of ecological balance:**

If you are experimenting on landuse you must have to take into consideration that the landuse is the product of ecological balance means the physical and non physical, economical factors can be effected on landuse so you have to keep balance between them otherwise your conclusion of landuse is to be filled wrong.

Therefore it should be an integral part of an effective agricultural research, advisory programme and the geography of agriculture.

Agriculture is the main foundation of rural life. Most of the people of the villages ranging from 15 to 60 years of age are occupied in agriculture infants and the aged to lend a hand in agriculture in some way or other. Rural society all over the word is mainly composed of farmers and the main occupation of all the members of the farmers family and of other families is agriculture, in which his wife, sons and daughters and kith and kin all help. Most of the population of the world in this scientific age resides, in the village with agriculture for its main occupation. Agriculture is the main occupation of developed and as well as developing countries, and most of the people of these countries are busy in farming.

Agriculture occupies an important position in Indian economy. Its contribution to the national income in 1950-51 was up to 54 percent which declined to about 30 percent in 1994-95. It provides food, fodder and raw material and thus contributes to overall economic growth. Its good performance over the period of time helps in the generation of more employment, thereby reducing poverty, hunger and malnutrition. The rapid economic development of any state or region without the development of its agriculture is almost impossible.
Agricultural output in India determines not only the per capita income of farm sector; it also influences the standard of living of rural population and the nutritional standard of the poor masses. The share of agriculture in the gross domestic product (GDP) in India is about 30 percent as compared to about 27 percent by the secondary sector.

C. **Physical characteristics of the land are almost permanent:**

All the physical characteristics of the earth like climate, geomorphology mean relationgraphy they all are permanent means man must not changed them constantly, that’s why when you studies, landuse you must keep those characteristics of earth in front of your eyes.

D. **Landuse is the product of its energetic system and production potential:**

Landuse is depend on his own energetic system and production. Landuse needed much more energy to achieve his target. The energetic factors are related with mans cultural and social activities. Landuse is more useful if you spend money when it required it gives him energy.

1.4 **Agricultural Landuse in India**

Indian agricultural is a land based activity and as such water and land have been the basic elements of life support system and an important resource for the economic life of a majority of people in the country. The way people handle and use being as well as for the sustained quality of resources. Indian agricultural is now poised for technical transformation for ensuring food security, export earnings and decentralized development to reduce rural poverty owing to the severe population pressure on the natural resources base of land, water, bio-diversity and other resources to meet its growing food and development demands (Wani M.H. at al., 2009).

The physical, economic and institutional framework taken together determines the pattern of landuse of a country at any particular time. In
other words, the land use pattern in different regions in India has been evolved as the result of the action and interaction of various factors taken together, such as physical characteristics of land, the structure of resource like capital and labour. Landuse is an important not only for producing foodstuffs, cereals, fruits and vegetables for consumption but also for generating surpluses to meet the increasing demands created by rising population and developing industrial sector.

The most vital resource of a country is land. It is a fixed asset and cannot be expanded to meet the needs of an increasing population. Therefore, it must be used carefully and in the best possible manner. The total geographical area of India is 32.88 lakh sq. kms. The major landuse in India is as follows:

Table No. 1.1
*Agricultural Landuse in India*

<table>
<thead>
<tr>
<th>Sr No</th>
<th>Type</th>
<th>1950-51 Area in Lakh Hect.</th>
<th>1989-90 Area in Lakh Hect.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total Geographical Area</td>
<td>3288</td>
<td>3268</td>
</tr>
<tr>
<td>1</td>
<td>Forest</td>
<td>404.8</td>
<td>677.6</td>
</tr>
<tr>
<td>2</td>
<td>Land not available for cultivation</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>i) Land put non-agricultural uses</td>
<td>93.6</td>
<td>212.4</td>
</tr>
<tr>
<td></td>
<td>ii) Barren and uncultivated land</td>
<td>381.6</td>
<td>198.0</td>
</tr>
<tr>
<td>3</td>
<td>Uncultivable land excluding fallow land</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>i) Permanent pastures and grazing land</td>
<td>66.8</td>
<td>116.0</td>
</tr>
<tr>
<td></td>
<td>ii) Miscellaneous tree crops and groves</td>
<td>198.3</td>
<td>35.7</td>
</tr>
<tr>
<td></td>
<td>iii) Cultivable waste land</td>
<td>229.4</td>
<td>150.4</td>
</tr>
<tr>
<td>4</td>
<td>Fallow land</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>i) Current fallow land</td>
<td>106.7</td>
<td>157.2</td>
</tr>
<tr>
<td></td>
<td>ii) Other fallow land</td>
<td>174.5</td>
<td>106.2</td>
</tr>
<tr>
<td>5</td>
<td>Cultivated area</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>i) Net sown area</td>
<td>1187.5</td>
<td>1395.2</td>
</tr>
<tr>
<td></td>
<td>ii) Area sown more than once</td>
<td>131.4</td>
<td>416.2</td>
</tr>
</tbody>
</table>

Source: Gazetteer of India (2004)
Agricultural Landuse

The net sown area, current fallows and land under tree crops and groves are included in agricultural landuse. The agricultural land in India is little more than 50% of the geographical area in the country. This is the highest share of land in any country in the world. But due to large size of population in India, per capita arable land is available only 0.17 hectares, which is lower than the world (0.24 hect). The per capita agricultural land in some select countries is much higher than India. In Australia it is 2.8 hect., in Canada 1.35 and in Brazil 0.33 hect. An indicator of high pressure of population on land resources is the lower per capita availability of land.

Since there is little scope for increasing land under the plough, the way out to feed the growing population can be found in increasing land productivity. Over the period, area sown more than once has been increasing which is about 15%. It is called cropping intensity if the same piece of land is sown more than once in a year which stands for the ratio between gross cropped area and net sown area.

For increasing intensity of cropping the use of new technology, fertilizers, good quality of seeds and irrigation facilities are necessary. The so called green revolution is also nothing but technological package, which include HYV seeds, chemical fertilizers and artificial irrigation. Agricultural, landuse has undergone a significant change after the adaptation of green revolution by India in 1966.

1.5 Agricultural landuse in Karnataka State

Karnataka is India’s eight largest states in geographical area covering 1.92 lakh sq.km. and accounting for 6.3% of the geographical area of the country. The state is delineated into 30 districts and 176 talukas spread over 27,481 village. Agricultural is the major occupation for a majority of the rural population in Karnataka. As per the population
census 2011, agriculture supports 13.74 million workers, of which 23.61% are cultivators and 25.67% agriculture workers.

A total 123,100 km$^2$ of land is cultivated in Karnataka constituting 64.6% of the total geographical area of the state. The agricultural sector of Karnataka is characterized by vast steppes of drought prone region and sporadic patches of irrigated area. Thus, a large portion of agricultural land in the state is exposed to the various of monsoon with severe agro-climatic and resource constraints.

In Karnataka agriculture is heavily dependent on the southeast monsoon. While only 26.5% of the sown area (30,900 km$^2$) is under irrigation, 64.60% of the total geographical area is under cultivation. In terms of total area under horticulture the state ranks fifth in India. It is also the largest producer of spice, aromatic and medicinal crops and tropical fruits. After Gujrat it is the second largest milk-producing state.

Karnataka is also the second largest producer of grapes in the country, and accounts for the production of 12% of total fruits, 8% of total vegetables and 70% of coffee in the country. It is the third largest producer of sugar and ranks fourth in sugarcane production.

In the overall growth of Karnataka’s economy agricultural plays an important role despite a fall in its share in the state domestic product. In Karnataka, horticulture crops occupy about 15.21 lakh hectares with an production of about 96.60 lakh tones. With regard to vegetable product Karnataka is highly progressive and extremes in temperature. It is also well known for floriculture production and is a major silk-producing state in the country. Agricultural growth rate (constant prices 2004-05) has fluctuated from a low of -2.8% during 2006-07 (over 2005-06) to a high of 13.3% in 2010-11 (over 2009-10) and again down to -2.9% in 2011-12.
Pattern Of Landuse

Land is a finite resource and day by day its demand for diverse purposes is increasing. There are large areas of utilizable but wasteland resources, moreover, the pressure of commercialization is increasingly forcing out productive land resources for non-agricultural uses. Considering the importance of landuse and policy, the Government of Karnataka brought out a document on landuse policy recently (GOK, 2003).

The analysis of landuse data from 1966 to 2009 indicates structural changes in landuse pattern. Areas under permanent pasture decreased consistently and areas under non-agricultural uses increased sharply during the past four decades. Fallow land, which was around 11 lakh hect, increased to 13.50 lakh hect. after mid-nineties (Table 2). Fallow land area fluctuates from year to year; in certain years (like 1998-99, 1999-2000, 2001-02, 2006-07 and 2008-09), the percentage reached above 10% of the total (190.50 lakh hect.) geographical area of the state. This was mainly because of deficient rainfall and the inability of the government to provide irrigation facilities in those years.

The net sown area also started shrinking after 1990s. The net sown area, which accounted for 55.776% of the total geographical area of the state in the triennium ending 1988, declined to 54.28% during the triennium 2007-09. The interpretation of this data is difficult because of many factors like illegal encroachments and changing landuse due to population pressure and market forces (GOI, 2004).
In future, land demand for non-agricultural purposes is going to increase. Area used for non-agricultural purposes mainly includes land under urban areas, land used for infrastructure projects, dams and irrigation systems, industries and special economic zones and mines and quarries (KSLUB, 2001). The perspective landuse plan for Karnataka 2025, published by the state landuse boards, GOK in 2001, presented the projected landuse plan under various landuse categories for Karnataka upto the year 2025.

### 1.6 Choice of the Region and Topic:

Bidar is a district of Karnataka state southern India. The historic city of Bidar is the administrative centre of the district. The district is located in the north eastern corner of the state, near the borders with Andhra Pradesh to the east Maharashtra of the north and West Gulbarga district lies to the south. Bidar is 120 km from Andhra Pradesh’s capital Hyderabad till 1956, Bidar was part of Hyderabad state.

The choice of area and topic under investigation are influenced by many considerations. Firstly this region occupying northeastern part of

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**Table No.1.2**

**Area under various landuse categories (Area in Lakh Hectres)**

<table>
<thead>
<tr>
<th>Landuse category</th>
<th>Triennium Ending with</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.agri purposes</td>
<td>8.76</td>
</tr>
<tr>
<td>Permanent pastures</td>
<td>16.76</td>
</tr>
<tr>
<td>Current fallows</td>
<td>10.65</td>
</tr>
<tr>
<td>Net Sown area</td>
<td>100.67</td>
</tr>
<tr>
<td>Gross Irrigated area</td>
<td>12.97</td>
</tr>
</tbody>
</table>

Source: Karnataka State Land Use Board, 2001
the Karnataka plateau is regarded as one of the developing agriculture areas of the state. Secondly it has a transitional location.

Thirdly, the economy of the region is essentially oriented of the Manjara River and it has made developments in agro-industrial production. During the last three decades, the use of agricultural land is changed with the growth of sugar factories. Hence the study of the use of land for crop and the changes in the products offers a scope for obtaining a more complete understanding of the agricultural landuse of the district. All these considerations have motivated the author to turn his attention to this district and its agricultural landuse pattern and changes therein.

All these physical factors on the agricultural centers in the study region. Therefore, this area is selected for the present research work.

1.7 **Significance of the research work**

From time to time agricultural practices have changed. They differ from place to place, depending upon the variations in environmental conditions cultural level and scientific technological and economic development. Agricultural has become an increasingly sophisticated occupation with increasing population, man has been forced to modify agricultural practices to increase agricultural output. The study of agricultural geography provides us the changing pattern of agricultural output and land relationship.

Significance of agricultural geography is as follows.

i) It provides guidance to regional planner for proper planning.

ii) It is useful to the traders who are engaged in the trading of the agricultural products.

iii) It is also useful to food economists, who wish to increase the production of food stuff.

iv) It is also useful to the irrigation engineers who plan to introduce new irrigation scheme.
v) The knowledge of agricultural geography is useful to the agricultural scientists, who wish to improve the structure of agriculture.

vi) It is useful to transportation developers who have to layout new roads and railway routs.

The study of landuse is essential to know factors principles, landuse classification, agricultural efficiency of the study region, crop combination, land capabilities, conservation of land and landuse pattern. It is also necessary to study tahsilwise variation in agricultural landuse, production of various crop and productivity of important crops. Agriculture is an important occupation of Bidar district. Nearly 75% population is engaged in this sector. It is necessary to compare with this new cropping pattern for the optimization of benefits and risk reduction thus.

1.8 Aims and Objectives:

The study is primarily concerned with the changing agricultural landuse pattern in Bidar district. This landuse study requires a set of maps in order to understand and to analyze it. But agricultural landuse survey is not merely the mapping of that was grown on land but it is the study of the analysis of the factors which bring out the landuse pattern.

Following aims and objectives have been decided for the present research work.

i) To analyze the effect of geographical factors on the Bidar district.

ii) To examine the general landuse and cropping pattern through the maps, in the high physical and socio-economic condition.

iii) To study the spatial distribution of agricultural landuse in the study region.
iv) To know the spatial land utilization under various categories of landuse.

v) To know the trends of agricultural landuse.

vi) To analyse the changes in agricultural landuse.

vii) To study the agricultural inputs and land capability.

viii) To study landuse cropping pattern and other aspects of agriculture of selected villages and divide the region into agricultural development region.

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

1.9 Database:

At this work has to be done single handedly. Author hope the readers will take into consideration its limitations. The data collected and used for the period 1999-2005 to 2006-11 came from primary and secondary sources. For the collection of primary data special questionnaires were used. Particularly required data of selected villages was collected through special questionnaires and personal interviews.

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 abstract of Bidar district, Census handbook, gazetteers, agricultural epitomes, periodicals, season and crop reports published by the department of agriculture. Data regarding consumption of chemical fertilizer, high yield variety seeds and pesticides are called from agriculture department of Z.P. This study pertains to 5 tahsils comprising 620 villages. For micro-study 2 villages from each tahsil are selected. Micro level study includes plot to plot survey of the land, covering information of relevant aspects such as sources of irrigation, area under various crops, general landuse, population, livestock and problems of agriculture.

(15)
1.10 Methodology

The data collected through primary and secondary sources were proposed and represented by statistical and cartographic techniques. As the study purpose to be geographical in spirit the choreographic 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 densities such as crude density, rural density, agricultural density and caloric densities are calculated the following formula’s are used for the calculation of various densities.

1) \[ \text{Crud Density} = \frac{\text{Total Population}}{\text{Total Geographical (100 Hect. is equal to 1 sq.km)}} \times 100 \]

2) \[ \text{Physiological Density} = \frac{\text{Total Population}}{\text{Net Sown Area}} \times 100 \]

3) \[ \text{Agricultural Density} = \frac{\text{Total Agricultural Population}}{\text{Net Sown Area}} \times 100 \]

4) \[ \text{Caloric Density} = \frac{\text{Total Agricultural Population}}{\text{Total Gross Cropped Area}} \times 100 \]

For measuring the changes in general landuse pattern. Five measure land use categories i.e. area under forest, area not available for cultivation, other uncultivable land excluding fallow land, and net sown area are considered for measuring the changes in general landuse pattern. In order to smooth but unusual fluctuation six year average data for the years 1999-2005 and 2006-11 are used. For studying land use efficiency the following formula is used.

\[ \text{Index of landuse efficiency} = \frac{\text{Total cropped area}}{\text{Net sown area}} \times 100 \]

For studying the changes in cropping pattern annual area variation of agricultural crops are calculated for the Bidar district only. For studying the changes in cropping pattern in the district the six yearly
moving averages are considered. The quinquennial average area under various crops and the relative share of each crop in gross cropped area has been deployed for the study of the cropping pattern in the study region.

The indices numbers of area of the agricultural crops are calculated by selecting 1999-2000 as a base year for the study of trends of area under different crops in the region. For the study of trends in area at taluka level the six years average data for the years 1999-2005 and 2006-2011 are used. For the study trends in area at district level compound growth rate is calculated. Weaver’s and Doi’s methods are used to calculate crop combination in the region. Bhatia’s (1965) following formula is used calculating index concentration of crop.

\[
\text{Index of determining concentration of crop 'a'} = \frac{\text{Area of crop 'a' in the component areal unit}}{\text{Area of all crop in the component areal unit}} \cdot \frac{\text{Area of crop 'a' in the entire region}}{\text{Area of all crop in the entire region}}
\]

For crop diversification the Jasbir Singh (1976) formula is used.

\[
\text{Index of crop diversification} = \frac{\text{Percentage of sown area under 'x' crops}}{\text{Number of 'x' crop}}
\]

Where ‘n’ crops area those which individually occupy 5% or more area.

Annual average trend rates of production judged by three years 1999-2000 to 2001-2002 and 2006-07 to 2010-11 for selected crops of the district. The indices of production of selected crops is also computed for the study of trends of production in the study region from 1999-2000 to 2010-11 (Base year 1999-2000).

Compound growth rate of production of some selected crop production is also calculated.
For the study of tahsilwise production trends from 1999-2000 to 2010-11, the six average data for the year 1999-2005 and 2006-11 are used. For study of trends in yields of selected crops simple growth is calculated only for the study region. Compound growth rate of yield is also calculated. ‘The crop yield and concentration indices ranking co-efficient’ technique introduced by Jasbir Singh et.al, (1982) is used to get a clear picture of productivity and spatial imbalances. To divide the region into agricultural development area the composite index is also calculated.

1.11 Review of Literature

Today, we are confirmed with the most battling problem of rapidly growing pressure of population on the limited land resources. This has resulted in an active shortage of food, attended by wide spread poverty, actual starvation malnutrition and low standard of living. The salvation of this grew problem lies in striking approver balance between the requirements of rapidly growing number and the inadequate food supply since land is the main source of our food and nutrition the proper appraisal of our land resources seems essential. The land is our primary resources and more crops can be obtained from this basic resource through its judicious utilization. The different types of landuse make in treated patterns which need geographical investigation and, how we can safely come to the conclusion that all our plans would be incomplete and defective. If we do not possess an accurate inventory of the existing land uses combined with the potentialities of the land different parts of our country.

The problem of under nourishment and malnourishment is still a matter of great concern to us and the main task before India is to increase its supply of categories in take contributed by protein foods we all know
that normal India diet is comprised of cereals and increase in per hectare production of staple food. The involvement of time and expenditure factors makes it more or less obligatory to the planners to modify the planning design differing from region to region.

In spite of numerous planning efforts during the last three decades in India majority of the population subsisting on the poverty and at regional level, there exists the abyssal socio-economic imbalance over her national space.

In recent years the concept of rural development has been given a great importance not only for alleviating the lost of the rural poor but also in utilizing the vast natural and human resources of village India for overall integrated national development and the improvement of quality of rural life in the country.

The seven lacks villages of India the land of villages so to say contain about percent of her people why should not we say than India lives in her villages and some 72% of her people are agriculturists. It is not in the great cities and commercial centres that the visitors will find the true India. But in the country side, where as the peasants of ten living in conditions idyllic represent in a real way the time warm traditions and customs of the country. To understand India one must understand India’s village life.

Undoubtedly India’s wealth lies in her agricultural fields. But how far these fields have been utilized and what benefits still await are matters of special attention for us. We must study the tracks engirding population concentrations and prepare land utilization maps showing the existing use of land we must find out the defects of the low yield and suggest there by remedies to overcome them. We must find cast India, suitability to other valuable crops such as cash crops or rare crops which the particular locality is in need of. The important of such a utilization survey becomes
all the more important in a population and yet the country suffers from food shortage, the aim will not increase while the population is inherently unlimited increase while the population in inherently unlimited and is increasing fast. Obviously the supply of agricultural products can be increased mainly by extension of able land and also improvement in agricultural techniques thus increasing the out turn per acre of the land.

At first, it seems easy to bind large areas of cultivable waste under the plough land thus increase the production, but unfortunately we neither possess a correct record at all the cultivable waste lands in the country now any detailed information as to why a particular piece of land is not cultivated. The cases naturally differ in different areas. In some places it may be water deficiency and in other abundant of water. In some areas soil erosion and undulating topography or bad drainage or harmful weeds or insects and pests may be the causes.

It is therefore very important that the land utilization of the earth may be carried out and maps showing the location of the lands, their present uses with reference to temperature, moisture, topography and soil conditions which influence the utilization of land for crops, postures or fruits may be carefully prepared. It is only after such survey that there can be a genuine re-orientation in our agriculture system which would not only make the country self-sufficient but may elevate it to position of surplus region.

**Techniques of Rural Landuse Planning**

One of the basic questions in landuse planning in India is regarding the technique which should be adopted for conducting the landuse survey. It should be worthwhile to review briefly the various techniques which have been adopted in the different countries.
S.C. Sharma:

Landuse and nutrition in the village Manikpur was studied by S.C. Sharma. The village under study lies in 26°44’ N and 78°54’ E in the Etowah district of Uttar Pradesh. It belongs to the central up land and plain of the Yamuna Chambal Doab, where the soils are light sandy loam water table is very low and no irrigation is practiced. The average annual rainfall is 798.2 mm more than 90 percent of which is received during the kharif season. About 90 percent of the land is arable 10 percent is not available for cultivation and a very small area is under Bajara and groves kharif and rabi crops occupy almost same place in the crop structure of the village. Kharif and rabi foodgrains together occupy more than nine tenths of total cropped area of the village. Bajara barley mixed with gram and gram are the principal foodgrains food-cum-commercial and fodder crops are quite in signified.

The per capita per day caloric intake in this village is 1900.01 of which about 53 percent is provided by the kharif 40 percent by the rabi and the rest by the animal products. The caloric intake in this village is for below the standard nutrition. The supply of fat carbohydrate calcium, iron vitamin A and C is also deficient in the average diet of the villagers. It is thus evident the people of this village are under nourished. In view of the great deficiency of the caloric intake and some other nutrients. The per hectare yield and the area under double cropping are to be increased with the introduction of irrigation and manuring facilities a change in the cropping pattern also seems to be desirable.

In order to ascertain the actual caloric and other nutrients intake the ‘Food Balance Sheet’ has been per pared for the Manikpur village. The actual production of each crop and other production was calculated on the basis of average yields with the help of actual production thus obtained and the total population dependent on the village produce per capita
intakes have been worked out and given in the food balance sheet on the basis of the revised recommendations of the Nutrition Advisory Committee of the Indian Council of Medical Research for daily allowance of calories and other nutrients it has been worked out that 2100 calories per day is the basis requirement of an average man in the village under study and can be called the ‘Standards Nutrients’ for judging the adequacy of their nutrients the basis requirements are protein 70 gm, fat 50 gm, carbohydrate 440 gm, calcium 0.8 gm, phosphorous 1.4 gm, iron 40 gm, vitamin A-7300 (I.V.), Vitamin B 1.7 gm, Vitamin C 200 gm.

It is thus evident that the people of this village are under nourished the low per capita total cropped land together with its uneconomic use resulting in low per hectare yield seem to be some of the main causes for such a deplorable plights of the village. In order to increase per hectare return and ensure the maximum utilization of land and other facilities should be tackled. Tube wells are the only mans that can profitably provide irrigation here. Another possibility of increasing the per hectare return is to extend the area under double cropping only 1.8 percent of the net cropped area of the village was cropped twice in the year with the provision of irrigation and other facilities the area under double cropping could be for their increased. In view of the great deficiency of some of the nutrients a change in cropping pattern also seems highly desirable so that the crops which are rich in iron and carbohydrate etc. May be grown there are many vegetables which are rich in a number of nutrients but at presents they do not find place on the landuse map of the village. They should be given due place in the cropping pattern of the village.

Majid Hussein:

Majid Hussein studied “The geographical basis of the well irrigation in the upper Ganga, Yamuna, Doab”. In this paper author correlated geographical factors with drilling the tube wells. He had also
considered the effect of tube well irrigation on changing cropping pattern of the study region. In this paper four maps are used for interpretation of data. The proportion of the cropped land irrigated by tube wells has been depicted in map.

**Shinde S.D.**

Shinde S.D. worked on ‘An Agricultural Geography of Konkan’. He used data from 1950-51 to 1970-71. He used choreographic and chorologic methods for interpretation of data. He has studied general landuse, agricultural landuse, village crops and horticulture and crop combination of Konkan region. He has also used various statistical methods.

Such as co-efficient of rainfall variability, percentage, volume of change in percent, ranking method, minimum deviation method for crop combination etc. The study of Konkan region organized into three sections (i) Physio-economic setting (ii) Spatial distribution of agriculture and (iii) Regimalization of agriculture. He found that there is vast variation in agricultural landuse cropping pattern in Konkan region. Agricultural is not developed in this region of facing various problems like, lack of irrigation; lack of high yields variety seeds, chemical fertilizers etc.

**Das L.S.**

“The Problems of Population and Landuse in the district of Bhagalpur, Bihar” have been studied by Das L.S. Author studied the distribution of population, population growth and future estimate of population. He also studied cropping pattern and population pressure on agricultural land. He considered different aspects in connection with agriculture.
Das K.N.:

Das K.N. studied the population pressure and intensity of cropping in the Kosi area (Bihar state). In his study he has used correlation coefficient, students “t” test for the study.

Majid Hussein:

He studied “Pattern of crop concentration in Uttar Pradesh, Geographical Review of India”. The object of the present study to define the pattern of crop concentration of U.P. by applying location quotient method. The statistics used in the paper limited to the district and are the average of five years. The method applied in the paper for the determination of crop diversity bring out some interesting contiguous zones of different densities of the important crops grown in the province. Moreover, the technique clearly indicates the zones of high, medium and low concentration of first ranking crops which are in conformity with the rainfall distribution and the physic-economic condition of the province. The study has a great reference for the planning of agriculture in the state.

Majid Hussein:

“Crop combination regions of Uttar Pradesh” have been examined by Majid Hussein. A study by applying the arbitrary choice method, the minimum deviation method, advocated by Weaver J.C. and maximum positive method advanced by Rafiullah S.M. the resultant patterns have been plotted on 5 maps. The precision, authenticity and usefulness of the different statistical and non-statistical methods of crop combination regions have been reviewed.

The agricultural statistics use in the paper relates to the district unit and averages of five years (1964-68). The application of the arbitrary choice method e.g. first crops only, first two crops or the first three crops etc. The statistical approaches applied reveal that 60th method i.e. the
minimum deviation method and though suffer from laborious calculations have their precision in the designation of crop region.

**Ali Mohammad**:

Ali Mohammad examined, ‘Agricultural efficiency regions-A case study of Kashmir valley’. The study aims to classify the Kashmir valley into agricultural efficiency regions on the basis of per hectare productivity taking tahsil as a unit various methods to measure the efficiency was revealed and a suitable method propounded by S.S. Bhatia was adopted for this region. Due to small number of units a suitable and convincing picture of this classification could not be availed. Therefore, a suggestion has been made to base this study on the village level data for such a smaller and homogeneous agriculture land limit.

**S.D. Paranjape**:

The landuse planning of village Karla was studied by S.D. Paranjape. It is situated close to the celebrated Karla caves 4 miles east of Lonavala and 38 miles to the west of Poona on the Bombay-Poona Road. Karla receives very little precipitation in April and May and most of it is concentrated in the month of June, July, August and September. The average annual rainfall received at Karla is 153 inches the soil this village is a mixture of medium regur and immature red soil the thickness of different soils were estimated by digging the soil layer very in thickness and three layer could be distinguished the top layer is thicker in the paddy lands than in the other areas. The land use of Karla is divided by three different uses:

i) Single crop wheat landuse 41.32% of the total area.

ii) Land under double crop is about 26.445 of the total land.

iii) Paddy main crop landuse in this village is the rice three methods of rice cultivation is used by Karla farmers namely:

1) Common Indian method
2) Japanese Method and  
3) Mixed farming or inter culture used in the double cropped area.

In the common Indian method seed preservation and manuring are not attended to the average production of rice varies from 8 mds per acre without fertilizers 18 mds per acre using fertilizer. The average yield per acre is 12 mds. In the Japanese method right from seed selection to the transplantation, the farmer has to be very care full in selection proper seed giving regular dose of fertilizers and skillful re-plantatation the average yield by this method is 22 mds per acre without fertilizers and upto 30 mds per acre by adding the fertilizer in specific quantities.

In the patches of cultivable waste near the river banks market gardening will be possible with irrigation similarly in the area devoted to double cropping instead of wheat rice can be grown as the second crop this suggests that high temperature condition do not allow the salty soil to hold enough mixture in the soil. In cover to active this contour flows are necessary there are only three perennial well in Karla and these are not sufficient to provide an adequate water supply to these thirsty lands.

Paranjape has suggested many suggestions to improve the productivity the climate is favourable for rice cultivation more average is devoted to wheat cultivation because of the sloping nature of the land less labour and less capital investment are required for wheat culture as compared with the rice cultivation. According to his opinion poor yield are not due to climatic deficiencies if modern methods like Japanese method of rice cultivation adequate use of fertilizers etc. are adopted and if irrigation is developed by constructing several bonds across the river Indrayani the productivity of land will be greately increased.

Surendra Singh:

The land utilization in Dunai village lies in tahsil Koil of district Aligarh was studied by Surendra Singh the landuse of this area has been
determined by physical environment and social and economic factors. Good amount of cultivated land is used for double cropping. More than 46% of the land is irrigated; irrigation in the village is from wells and tube well the largest amount of the land is under cultivation. Arable land includes good and medium quality land the good quality land is suitable for intensive cultivation. It has good irrigation facilities. First class deep loam soil is situated very near to the settlement and is free from erosion medium quality land is second class agricultural land. It is susceptible to erosion and drought cultivable waste lies in the northern part of the tract. It comprises 20.7 percent of total area. It is poor land with shallow sandy soil. It includes land under grass forest. Scrub and fallow the unproductive land covers 10.2% of the total area, it includes settlement roads water bodies and barren land.

The crop landuse in Kharif season extends from June to October the crop generally depends on rainfall the Kharif crops are grown in 44% of the gross cultivated land kharif crops are bajra and archar, maize, rice, cotton and sugarcane. The rabi season extends from October to March the crops cover 55.2% area of the gross cultivated land which is greater than kharif season wheat, pea, barley, vegetables and pulses are the main crops in this season. Double cropping is practiced in good quality land situated near the settlement the land has good irrigation facilities deep land fertile soil and receives heavy manuring, wheat, barley, pea cotton, sugarcane and maize are the chief crops which are raised on this land in both the seasons 23.5 percent area of the total land is under double cropping which is 34.1 percent of the available cultivated land.

About 58.4 percent of the population is directly dependent agriculture. It is comprised of 35.3 percent male and 25.1 percent female 27.6 percent the total population work as agriculture labour of which 13.3% are female the net cultivated land the total population of the
village are 571 acres and 611 respectively the per head share of the cultivated land is 0.13 acres. The per capita share of the gross cultivated land is 1.25 acres.

He had suggested may improvements for better land use out of 828 acres of land 20.9 percent area is under culturable waste, which is situated in the north of the village and along the nullah. It is suggested that steps should be taken to reclaim this land the net cultivated land is 68.9 percent of the total area but the average yield from the land is very meager. It is suggested that some improvements in agricultural implements method of tillage manuring and their better use should be effected the facilities of irrigation should also be extended to the area which are devoid or well and tub wells. It will bring a large amount of land under double cropping which help in augmenting the average yield of the crops the nallah which is a mean to the agricultural fields during the rainy season should be depended and a lock at a suitable place may be constructed. The water conservation practices should also be introduced by taking some canals from the nallah so that the flood water can be used for irrigation and the chance of adjacent agricultural fields becoming flooded is eliminated.

The Koli village is situated near a good motorable road and it is well suited for market gardening. To decrease the pressure of population from agriculture the agricultural labour should be diverted towards the secondary occupations such as poultry dairy farming, horticulture, basket making and cottage industries. The per head share of the cultivated land is very small. It is suggested that mixed cropping should be encouraged in the area. The deep rooted and shallow rooted crops can be grown in the same field, like the pea and sannhemp sown in the sugarcane.

The farmers follow the old practices of crop rotation. It is suggested that rational method of crop rotation should be followed the deep rooted crops should not be sown repeatedly on the same field but
should be rotated with shallow rooted crops to enrich and recoupe the soil fertility the crops like wheat, bajara, potato and sugarcane should fallow the green manuring crops such as pea guar, sannhemp and gram.

**Martin Billings**:

Martin Billings studied agricultural production in Mali. Agricultural development of the Saahal is possible, as illustrated by analysis of the conditions and opportunities in Mali. Two key elements like water control and energy were considered by another national financing and skills are also considered by him. Agricultural region, the crop production system, cash crops, co-operatives, water. Agricultural support organization, prices and marketing has been elaborately discussed.

**More K.S. and Shinde S.D.**:

They have studied, population pressure on agriculture (Kolhapur Dist.) a geographical analysis. They have calculated density and nutritional densities for the population pressure on agricultural lands they calculated co-efficient of overpopulation for the study region. At that time co-efficient of over population was 1.49 for the study region where 0.76 for the state of Maharashtra.

**Majid Hussein**:

Majid Hussein examined a new approach to the agricultural productivity of Sutlej-Ganga plain of India. In this paper an attempt has been made to delineate the agricultural productivity regions of the Great Plains of India taking into consideration the area and production value in turns of money of the 25 crops grown in the area under review. A three years average (1968-71) date of all the reporting crops has been taken into consideration. Index has been calculated for the determination of agricultural productivity of each of the component area unit (district).
Jana M.M.:

“Cropping pattern in West Bangal” has been studied by Jana M.M. In this paper attempts have been made to rank the crops in different districts on the basis of cropped land to compare the yield rates for finding out the crop specialization in the district of West Bangal. He has calculated the concentration indices of crops different areas used by the author.

Jha B.N.:

He studied the problems of utilization in the Kosi Basin, which passes through the various physical and cultural activities including the emerging problems of land utilization in the region.

Mohammad Abuzer:

Mohammad Abuzer studied agricultural responses to population differentials in Punjab-Haryana plain. In this study a parametric texts has been used, Pearson product movement co-efficient of correlation and ordinary least squares bivariate regression have been adopted for parametric texts. He has found that the crop yield and pressure of population are having a positive relationship.

Mavi G. and Pandy V.K.:

They have studied, Agrarian structure under the new economic policy with special reference to Meerut district of Uttar Pradesh. Two stages stratified random sampling was followed where each of as separate strata. From each tahsil ten Patwari circles were selected randomly at the first stage. Then at the second stage, ten cases of land safe and six cases of land lease were selected randomly from each Patwari circle. Each sale case insisted of one lesser and the respective lessee. Thus a total of 400 sellers, 40 of buyers, 240 lessons and 240 lessee were randomly sampled and interviewed for the collection of data relating to the their sate lease transaction in agricultural lands made during 1991. The study concluded
that the concept of minimum size of viable holding for family sustenance has already emerged among the marginal and small holders at least in progressive and developed areas.

**Zafar Iq balkhan and Shafat Ali Khan:**

“Levels of agricultural productivity in Jammu and Kashmir state” have been studied by them. They have studied the levels of agricultural productivity and the factors responsible for variations in agricultural productivity in Jammu Kashmir. Authors applied methods of M.Shafi’s (1972) and Enydei’s (1964) for the calculation of index of productivity. Their discussion reveals that the overall situation of the agricultural productivity in the region is not satisfaction. There is variation in agricultural productivity in the region.

**Anuradha Sengupta:**

Anuradha Sengupta studied a water resources and agricultural productivity in Malda district. This paper seeks to analyze the water resource management with special physiography parameter to increase the level of productivity, to reduce the regional imbalance in the Malda one of the North Bengal district of the West Bengal. Author found that within all environment factors soil has been maximum utilized and the manpower also. But all other factors are not properly utilized to the same extent.

**L.D. Stamp:**

Foremost, perhaps is useful work carried out in British in the thirties under the direction of Prof.L.D. Stamp. The survey undoubtedly played an important role in the scientific planning of landuse and provided in base for increasing Britain’s food production sustainably, the aim of the survey was to record the existing use of every area of land on the British ordinance survey on a scale 1.10560 which show field boundaries and other features in detail. The technique of the survey by
placing the appropriate letter in its relevant places on the map after
recording the maps were reduced to a scale of 1.63360 and suitable
colours were also assigned of different features much of the field work
was alone by a large number of helper from schools, colleges and
universities. The survey therefore provided first hand facture information
by recording the facts on maps and thus indicated the factual
distributions. It is in this sense that the landuse survey of Britain may be
considered as unique and fundamental.

Mention should be mode of some Government sponsored project
which aimed and other purposes. American geographers played an
important role in three such surveys. Firstly the survey of the Tennessee
Valley Authority. Secondly the Michigan Land Economic Survey.
Thirdly the rural land classification programme of Puertorico.

The Tennessee valley authority developed the ‘Unit Area’ method
of land classification which recognizes distinct areas of limited extent,
each differing from its neighbours due to a combination of particular
physical features and these combinations are recorded by a “fractional
rotation system” which combines the use of numbers with the use of
letters the technique used by the Tennessee Valley Authority involves
long fractions short for action and roman numbers, the numerator of the
long fractions refers to the method of landuse and it general
characteristics, while the denominator indicates the physical
characteristics of the area vegetation and similar natural features, the
analysis and mapping of the information was entrusted to the
Geographers.

The rural land classification programme of puer-to-rice in which
the department of Geography of the north-western University played an
important role made an attempt to indicate both landuse characteristics
according to its agricultural usefulness.

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J.H. Buck:

In the thirties a landuse survey carried out in China where in data were connected from 16,786 farms scattered in 168 localities which were part of 15th has in lying in 22 provinces. The collection of data relating to population, food. Standard of living and man a creating were also included in the survey.

Mohammad Tanfigue, Muntar Ahemad and Abdul Munir:

They have studied spatial analysis of agricultural productivity in Western Uttar Pradesh is the most developed and prosperous region of the state lies approximately between 280’20’ North and 290’45’ North latitude, 770 East and 800 East longitude. Author used secondary data. District has been taken as the unit of study. The productivity indices of crops considered for each district were calculated following the statistical technique formulated by Yang (1965). They considered creeds cash crops and oil seed for the study. Authors found high concentration of cereals in western Uttar Pradesh due to impact of various institutional and technological factors. The low productivity of pulses regire attention of the farmers and government agencies. Efforts and product of pulses. It can be achieved through the adoption of new varieties of seeds and by safeguarding the interest of the farmers.

Author’s concluded that the modern form of technology and socio-economic development are entwined in a symbiotic relationship. The two forms together on interesting phenomenon where each is a means of achievers the other. Advanced form of technology undoubtedly leads to socio-economic well being and it in turn sets the farm technology on wheels towards a greater well being.

Ayyar N.P.:

Crop regions of Madhya Pradesh have been studied by Ayyar N.P. He used statistical approach to the study of crop combination region. He
suggested maximum distance method to group important crops into associations. Author has taken review of some specific studies.

**Mandal R.B. :**

Mandal R.B. has modified the Weaver’s method in analyzing crop combination regions with special reference to North Bihar. He has studied number of crops of North Bihar. He used Weaver’s method of crop combination with modification for the North-Bihar.

### 1.12 Chapter Scheme

The present study entitled, “Agricultural Landuse in Bidar District: A Geographical Analysis” is divided into seven chapters. The first chapter ‘Introduction’ consists introduction, definition and basic elements of landuse, choice of the region and topic, significance of the study, aims and objectives, database and methodology, review of the literature and arrangement of chapter. The second chapter presents physical and socio-economic setting of the region. It begins with the location, physiography, climate, drainage, soil, vegetation of the study region, socio-economic factors as basis of farming in the region includes the analysis of livestock, agricultural scenario and industrial area, transport, trade and commerce, socio-economic aspects and population. Third chapter deals the general landuse pattern in which total land area is grouped into three categories i.e. non-agricultural land, potential land and agricultural land. Fourth chapter is devoted to analyze the agricultural landuse, which include cropping pattern and changes therein.

Chapter number five deals with the study of technological inputs, agricultural changes and land capability have been analyzed. Chapter number six deals with the study of sample of selected villages where in an attempt is made to measure the amount of changes in landuse pattern of 10 villages in the region. This is followed by the chapter number seven which deals with suggestions and conclusion.
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