CHAPTER I

THE SCOPE AND METHODOLOGY OF THE STUDY

Introduction

Land sustains life in the world and is vital for the survival of all animals including Man. It sustains plant and animal life and provides Man with living space, food, clothes and housing materials for the satisfaction of human needs. In a broader sense, it includes all free gifts of nature or the entire natural environments that exist independently of Man's activity. "This broad concept of land includes all of the earth's surface, water and ice as well as ground. In addition to building sites, farm soil, growing forests, mineral deposits, and water resources, it also involves such natural phenomena as access to sunlight, rain, wind and changing temperatures and location with respect to markets and other areas. Moreover, it includes all those man-made improvements which are attached to the surface of the earth and which cannot be easily separated from it".¹

The present study is not directed to include all the free gifts of nature or the environment which constitutes land in economic sense but is confined to that part of earth's surface within which and upon which life takes place. This land or the earth's surface is used

for several purposes and according to the uses to which it is put may be classified as agricultural land, forestry, land used for sites (for rural and urban habitation), land used for industries, for commerce and for transport, recreational purposes and other land remaining as barren, waste, deserts etc. Agricultural land is further classified as cropped area, pastures and other fallow land. Ordinarily agricultural land is that part of earth's surface where the land is used for growing cultivated crops. The present study relates to the different use patterns of land and problems discussed here concentrate on all use classifications as determined by the Government according to recommendations made by the Technical Committee on Coordination of Agricultural Statistics, Government of India. Here more emphasis was laid on the agricultural land which includes as indicated, cropped area, pastures and other fallow land.

Land is fixed in supply. The increasing pressure of population on land is the sole cause of the rising man-land ratio, which sometimes even determines the type of farming and the crops cultivated. But the pressure of population and accessible markets are themselves insufficient to ensure that all land is employed intensively. Even in densely populated country like the United Kingdom, there are still large areas where the land is normally used for light grazing or sport. The

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may be different in industrially backward countries like India, where 82 per cent of the people live in the countryside and agriculture is their main occupation. India ranks second in total population map of the world, next to China. But considering the present rate of growth of population in India which is 2.4 per cent per annum according to 1971 Census, intensive utilization not only of cropped land but also land under miscellaneous tree crops and groves, forests, pastures and grazing land etc. is highly desirable. Adequate land utilization can bring about better labour force utilization and underutilization of land rather than a critical man-land ratio, may be the crucial bottleneck to production and employment.

The utilization of agricultural land in hilly areas of India is of different character. In the hilly areas, the shifting cultivation, which is commonly known as Jhumming is predominant. Jhumming or the shifting form of agriculture evolved in the Neolithic Age between 13,000 to 3,000 B.C. still survives over a large part of the globe. It is recognized as traditional stage between


economy of hunting-gathering and settled farming. From centuries ago, it is found that as compared to settled farming, shifting cultivation is a purely subsistence form of land use. Saikia, P.D. et al. (1979) observed that because of pressure of population and progressive deterioration of soil in the hill slopes jhum land is gradually becoming scarce and as a result the jhum cycle is becoming shorter. Ganguli (1969) made a survey of jhumming of Tripura, Bose (1967) surveyed two villages in Paul-Lakher area in Mizoram and Saha (1970) made a survey of shifting cultivation in Assam (including Meghalaya and Mizoram). These studies show that the shifting cultivators are the most backward section of the hill tribes of the North Eastern Region.

5. Jhumming consists of clearing the forest slopes, burning the fallen trees and bushes and dibbling or broadcasting the seed in the ash-covered soil. The rest is left to Nature... The fertility of the soil is soon lost and some of it is washed away in the heavy rain. Cultivators then shift to other clearings and then the cycle continues in rotation (Government of India: Report of the Scheduled Castes and Scheduled Tribes Commission, 1960-61, Vol. I: 44).


Among various uses of land, the use for agriculture seems to be the most important.

Agriculture is defined as "the art and science of purposeful use of soil for raising plants and breeding animals by a community. It includes, therefore, integrated set of ideas, culture, traits, skills, techniques, practices, prejudices and habits employed by the members of a given society for extracting a living from the soil". In most of the countries of Europe and especially in the U.S.A., the U.S.S.R. and Japan, emphasis has been laid on study of land resources so as to realise the optimum utilization of scarce land resources by correcting the traditional trial and error methods through classification and mapping of lands. In developing countries like India, the trial and error methods are still prevalent as a result of which the land resources are gradually deteriorating. An F.A.O. publication points out that in countries where attempts are


being made to modernise agriculture through the adoption of scientific practices, there is the excellent opportunity to correct past errors in land use and to avoid further errors through classification and mapping of land. In China, man has modified land to a considerable extent so as to make it more productive. The intensity of any agriculture is partially measured by the extent of such modifications. In China, physical conditions of the land are modified through irrigation, drainage, terracing and to a smaller extent by fertilization, which tend to bring about a higher degree of utilization. In India, there is also a unique example in Kerala, where higher density of population and the acute scarcity of land and the chronic problem of food shortage compelled the people from early days to reclaim land from the bed of the lakes for rice cultivation.

Rutland, the rice-bowl of Kerala is a man-made land which has emerged out of their labour. In advanced countries, barren land lying idle for several centuries are now brought under use through heavy reclamation; forestry has been developed in such land. Other form of utilization of such land, is development of grass for pasture.

The economic prosperity of a country is also linked up with the size and composition of its population. The existence of a very small population makes it impossible for a country to harness its natural resources; on the other hand, if population is abnormally large, the per capita availability of land will fall and so also the income and in such overpopulated countries, intensive utilization of agricultural land is a must. Intensive farming is characterised by the use of relatively large number of productive factors as labour, machinery, livestock and management in a specified land. In a densely populated country like India, land-based enterprises represent not only a source of income to a vast majority of people but also a critical determinant of the pace of economic development. The identification of various socio-economic problems associated


with the utilisation of agricultural land would enable the administration to take effective measures.

Water is an inseparable element in optimum utilisation of land. "Land, water and people go together. The people cannot reach the highest standard of well-being unless there is the wisest use of the land and the water." The proper use of land and water resources seems to be of utmost importance in view of rapid rise of population in recent years. The advanced countries like Japan and the U.S.S.R. have shown the world that with the aid of science and technology, land and water resources can be utilised to the desired extent. In spite of India's vast potential wealth in water, land and other natural resources which perhaps compare favourably with those of any other advanced country in the world, more than 30 per cent of her people is still living below the poverty line. In such situations, optimum utilisation of land and water resources through irrigation, hydro power, etc. is of paramount importance. Owing to differences in intensity and distribution of rainfall, the management of water resources is of vital necessity with a view to bringing agricultural land into the most productive use.

There is a need of proper classification of land after careful adjustment keeping in view the maintenance of ecological balance. It is often seen that there

is over-lapping among different uses of land in the country. With the progress of a country towards higher civilization, a part of the cultivated land has been utilised for residential and industrial purposes, for construction of roads and railways, pipelines, etc. The expansion of urban areas in the recent past has also affected the use pattern of a country to a great extent.

Position in Assam

Agriculture remains the mainstay of the people of Assam contributing 56 per cent of the State income. According to 1971 Census, 65.8 per cent of the labour force is employed in agriculture. The growth of population in Assam is the highest among all the States in India, being 3.5 per cent per annum against 2.1 per cent in the country according to 1971 Census. The 1971 Census has further revealed that during the decade 1961-1971 the number of persons per occupied census house in Assam rose from 5.47 in 1961 to 5.98 in 1971. This indicates the pressure of population on residential accommodation too. Almost the entire increase of population has been absorbed by the rural areas alone, in which figure went up from 5.46 persons in 1961 to 6.03 in 1971 per census household.20

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Per capita cultivable land in Assam is only 0.19 ha against 0.60 ha in Maharashtra, 0.57 ha in Madhya Pradesh and 0.55 ha in Gujarat. With the increase of population, per capita arable land will further decline in view of the spread of townships and need for more land to be used for residential purposes. On the other hand, rapid industrialisation modifies the pattern of land utilisation. Since, by industrialisation and thereby creation of new townships, the proportion of land available for cultivation per capita goes on decreasing. 21

There are 19 lakh farm families and 5 lakh landless labourers in the State. This corresponds to an average density of 5 people per cultivated hectare. Average agricultural holding size is only 1.47 ha against all-India average of 2.3 ha and nearly 60 per cent of the farmers have less than a hectare. Therefore, subsistence farming predominates. Only 10 per cent of the holdings are larger than 3 ha and these comparatively big land holders operate 40 per cent of the cultivated area.

The authors of 'Limits to Growth' 22 have calculated that every child born today would need 0.08 ha of land for purposes like housing, roads, water disposal, power supply and other uses; and 0.40 ha of land for producing food. On this assumption the whole of India will require at least 5 million ha of additional land every year to support new comers. In 1969-70, the

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availability of agricultural land in India was only
0.34 ha per person which was reduced to 0.28 ha per capita
during 1970-71. With the projected population, area and
production of foodgrains by the National Commission of
Agriculture23, per capita availability of arable land in
India would be 0.22 ha in 1985 and 0.17 ha in 2000 A.D.,
which according to them will be less than the minimum
requirement of land per capita. In Assam, the estimated
population by 1981 would be around 20 million and the
per capita land available for production of agricultural
crops would be 0.13 ha of land. This has indicated the
necessity and urgency of studying the patterns of land
utilization in the country so that effective measures like
that of Japan (where per capita arable land is only 0.05 ha
during 1970-71)24 can be taken to raise the required
quantity of foodgrains and raw materials to feed the
growing population and industries in the country. In
Taiwan, agricultural output has been raised by about
73 per cent in 1951-61 period. This has been possible
by affecting land reform and reorganizing agricultural
extension services in that country.25

to Growth; Universe Books, New York, p.205.

23. Report of the National Commission of Agriculture,
Ministry of Agriculture and Irrigation, New
Delhi, 1973-Part I, p.190.

24. Indian Agriculture in Brief-Thirteenth Edition, Direc-
torate of Economics and Statistics, Ministry
of Agriculture and Irrigation, Govt. of India,
New Delhi, 1974.
Although the rise of population is the highest in Assam, foodgrains production is not encouraging. Agricultural production in Assam is one of the lowest in the world. Data on land utilization would indicate that the net area sown is only 33 per cent and there is no further scope to bring more areas under plough. The proportion of area under forests has already come down from 38.5 per cent in 1951-52 to 26.3 per cent during 1975-76 in the plains districts of Assam. The land-man ratio is likely to narrow down with the gradual increase in population. Under a fixed land economy situation, measures are to be taken towards raising yields per unit of land so as to produce more and more foodgrains and raw materials. The average yield/ha in Assam is also very low. The low yield might be attributed to several causes economic, social or physical which require investigation to locate the constraints associated with the utilization of land. An analysis of data on land utilization in the state is expected to bring into focus the various lacunae in land utilization which will help the appropriate authority to take steps so as to improve land utilization.

Scope of the Study

Although several studies relating to different aspects of land utilization have been conducted in different parts of the world, a detailed study on the land

utilization patterns is yet to be undertaken in India, not to speak of Assam. However, Giri (1961, 1968 and 1969) has made interesting studies on the changes in land utilization pattern and factors associated with them in India as a whole and on Tamil Nadu and Punjab for the period from 1950-51 to 1963-64 for all-India, from 1950-51 to 1964-65 for Tamil Nadu and from 1950-51 to 1964-65 for Punjab.

Nath (1953) observed by analyzing general land utilization data in the country for the year 1949-50 that the objective should be to secure a pattern of land use for each region under which all lands are used according to their land use capability. This means on the one hand reduction of idle and waste land in each region to the minimum by suitable reclamation and land improvement measures and on the other hand for securing such alterations in the existing pattern of land use as are necessary for raising productivity or for conservation of soil and water.

While studying agricultural land utilization in the country, Chanan (1966) has made an attempt in analyzing data on land utilization pattern in different


sub-regions (for the year 1952) along with different States for the year 1958-59. By comparing land use pattern data with other continents and selected nations, he showed that amongst the large countries of the world, India had the largest proportion of the land devoted to the cultivation of crops.

Mishra (1973) has noticed that the area under forest, barren and uncultivable land, culturable waste, land under miscellaneous tree crops and groves in Uttar Pradesh had shown a declining trend in the first three National Plans.

Singh (1970) has taken great pain in bringing into light clearly the variable patterns of land use and in preparing its detailed inventory in the two physical units, the Vindhyan Upland rim and the Valley plain in Mirzapur district in U.P. He noticed the impact of physical, social and cultural factors on the different types of land farming systems. He incorporated in his study the actual land uses and their changing pattern since 1879 and for primary information he incorporated data from four villages.


Jalal (1976)\textsuperscript{31} has made an attempt at presenting a vivid account of the general and agricultural land use by verification and physical factors responsible for effective land utilisation in the district of Pithoragarh. He further observed that the land use pattern of an area was an outcome of its physical environment and human endeavour.

Goswami (1968)\textsuperscript{32} has suggested possible use patterns of different land classes in the Garo Hills, particularly in relation to jhumming. He further suggested that flat bottom up to 5 per cent slope where prospect of irrigation is fairly bright can be cultivated with rice without special soil conservation measures. Valley land remaining under water are suitable for rice cultivation with proper drainage. He also advocated land use based on land capability status.

In the survey of land use in Britain, Stamp (1950)\textsuperscript{33} has observed that the physical factors are dominant in determining the land use patterns. He has found that the distribution of arable land is a very faithful reflection of physical conditions. The excellent soils and low rainfall of South-West Lancashire explain the dominance of ploughland there. The scatter of small arable fields in the West is a reflection of the dominant

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\item[32.] Goswami, (1968).
\item[33.] Stamp, (1950).
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system of lay farming and local concentrations of ploughland have each their explanation in terms of soil and climate.

In the study on Land Utilization in Australia, Wadham et al. (1957) have found that considering the actual conditions of climate, topography and soil which control settlement, four-fifths of the country could not be settled much more densely because of rainfall deficiency or other factors and indicated the margin which exists between actual and potential standards of living at which land will support its people. The study further revealed that with the introduction of modern technology in wheat cultivation in the gray chernozem-like soils of the Wimmera is an excellent example of the extent to which the utilization of land in a district has been changed through introduction of new methods.

In another study entitled Land utilization in China, Buck (1956) has observed that in China, Man has

32. Goswami, P.C. (1968) : Shifting Cultivation and Its Control in Garo Hills, Department of Soil Conservation, Assam, Shillong.
modified land to a considerable extent so as to make it more productive. "The greatest amount of change in China is the adjustment of the moisture condition of the soil either through irrigation or drainage. Soil conditions are further modified by fertilisation, by allowing or preventing soil erosion by changing the slope of land through terracing and sometimes by reversing the position of the layers of soil".

Though a comprehensive study on land utilization in Assam has not yet been undertaken, some works have been done on land systems and land utilization in connection with different studies on the economy of Assam. Goswami (1963) 36 has given the land systems and land utilization pattern in Assam upto 1960-61. Dutta (1968) 37 has also referred to land utilization pattern in Assam, particularly in the district of Goalpara and the Karimganj Sub-division of Cachar district in connection with his study on land systems and land reforms in Assam. Saha (1976) 38 has given the utilization pattern of land from 1950-51 to 1973-74 in connection with the study on agriculture development of Assam. In the micro level, an idea on land utilization pattern in different villages can be had by going through the continuous village study programmes so far conducted by the Agro-Economic Research Centre for

North East India, Jorhat. But most of the data available from the above studies are not strictly comparable due to changes in the system of classification, different designs and coverage of the studies.

We propose to undertake here a systematic analysis of the changing pattern of land utilisation and the factors responsible for such changes. In this study the nine-fold classification recommended by the Technical Committee on Coordination of Agricultural Statistics, Government of India has been used and where data available from secondary sources were found lacking in this respect, an attempt has been made to bring them into nine-fold classification for a comparative study. Here we have made an attempt to give a picture of the present pattern of land utilisation in all the plains districts of Assam as a complete set of data for the two hill districts (Karbi Anglong and the N.C. Hills) are not available. Secondly, the changes in the utilisation of different categories of land over 25 years from 1951-52 to 1975-76 and the factors that might have influenced such changes have been discussed. Thirdly, an attempt has been made to indicate the prospects of optimum utilisation of land in view of the growing population pressure and introduction of farm technology based on science and technology by discussing the problems of land utilisation. The problem

39. Village Studies : Morangaon, Khonajan, Chetahaihber, Borkalei, Chalihaagam, etc. Agro-Economic Research Centre for North East India, Jorhat.
of land utilization has two aspects mainly viz., the
level of utilization of cultivable area, in other words
the proportion of cultivable area actually cultivated
and the intensity with which the cultivated area is
being utilized.

Social factors affecting modernization of
farm technology and optimum utilization of land have
been indicated on the basis of field surveys conducted
in connection with the study. In view of the fact that
no study worth the name has been undertaken on the uti-
лизation of land under effective occupation of tea
industry, a venture has been made to give a picture of
the land utilization pattern in the tea estates of
Assam. It should be borne in mind that a particular plot
of land may be used for different purposes for raising
different types of crops. In this study we have indicated
how best land can be used optimally on the basis of present
knowledge and technology.

Methodology

For the present study two sets of data have
been used. For this study on the State of Assam, secondary
data available from the State and the Central Governments
publications and the records are collected and analysed.
Besides, data published in the different studies on the
economy of Assam have been used and referred to in
appropriate places.
To supplement secondary data, a field survey was undertaken in the two districts of Assam viz., Sibsagar and Nowgong selected purposively. The district of Sibsagar is a representative district in respect of land utilization in Upper Assam where tea and rice dominate the cropping pattern. Nowgong though situated in Central Assam, has two distinct zones - the low-lying central valley portion and the sub-montane high land. In this respect the district represents the pattern in land utilization in the Central and Lower Assam. Five villages from each district were selected to cover different crop zones. One of the five villages from each district was selected on the basis of irrigation facilities to study how controlled water supply influences the use pattern of land. Ten households from each of the ten villages have been selected at random from the lists of households prepared on the ascending order of operational holding. Data have been collected with the help of schedules and questionnaires canvassed during 1976-77 crop seasons by interview method.

Data on land utilization pattern of the ten tea estates under different ownership groups have also been collected for incorporating in the thesis.

Layout of the Thesis

For the purpose of expository and analytical advantage, the thesis is divided into eleven chapters.
Besides the first chapter, the three chapters viz., chapters II, III and IV deal with the connected analysis and interpretation of factors affecting land utilisation in the State. Chapter II deals with the geo-physical background of the State where a brief idea about the geo-physical conditions of the State is incorporated. Chapter III is intended to provide a focus and background on different aspects of socio-economic development of the State. Chapter IV includes a brief description of historical evolution of land tenure and policies on land systems and land reforms.

From Chapter V to Chapter XI, a detailed discussion on land utilisation patterns in the State of Assam together with the cropping pattern, crop intensity, crop rotation, production and productivity, fragmentation of holding etc. with associated factors are thoroughly discussed. An analysis of primary data on micro level has also been incorporated. An attempt is being made in Chapter V to give a brief account of the utilisation pattern of land in historical perspective. It gives an idea of land utilisation pattern before the Ahom rule, during the Ahom rule and during the British administration. Chapter VI and Chapter VII are completely based on data from secondary sources on utilisation of land during post-independence period. Chapter VI gives a comparative analysis of data on land utilisation pattern of the country, other States and Assam along with other plains districts of the State. Chapter VII is devoted to the analysis of data
on land utilisation pattern in the State for the period 1951-52 to 1975-76. There is an attempt to focus the changes in land utilisation during last 25 years with the associated factors responsible for such changes. This chapter also depicts and describes the cropping pattern, the crop intensity, production and productivity, fragmentation of holding of land and other certain aspects related to the extensiveness, intensiveness and efficiency of land utilization in the State of Assam.

Chapter VIII is concerned with a short description of land utilisation pattern in tea estates in Assam. It gives an idea on the role of tea industry in the State's income, patterns of land utilisation in tea estates and problems that are faced by the tea estates for better utilisation of land under effective control of tea estates.

In Chapter IX, a micro-level analysis of primary data collected by the author are analysed with a view to focussing the factors affecting land utilisation by farms. This chapter gives an analysis of the relationship between the cropping and the size of holding and also the influence of the level of irrigation on production and cropping intensity.

Chapter X deals with the various socio-economic, natural and institutional factors which stand as impediments to
optimum utilization of land in the State.

Chapter XI contains the summary and conclusions of this study indicating the policy implications for the effective land utilization in the State.