CHAPTER I

INTRODUCTION

A perspective on the problem:

Agriculture is the main source of livelihood for more than half of the world's population. In some countries more than 70 per cent of the inhabitants support themselves by farming, while in the more industrialized countries the proportion range much lower. In looking back upon the history of the more developed countries, one can see that agriculture must be able to produce a surplus of food to maintain the growing non-agricultural labour force. Since food is more essential for life than are the services provided by merchants or bankers or factories, an economy cannot shift to such activities unless food is available for barter or sale in sufficient quantities to support those engaged in them.

A country seeking to develop its economy may be well advised to give a significant priority to agriculture. Experience in the developing countries has shown that agriculture can be made much more productive
with the proper investment in research, fertilizers, insecticides and herbicides, improved seeds, improvement of irrigation systems may also be essential.

As Agriculture becomes modernized, its dependence upon land as well as upon human labour decreases. Animal power and machinery are substituted for human labour; then mechanical power replaces animal power. The substitution of mechanical power for animal power also reduces the need for land.

The increased use of fertilizer as modernization occurs, also acts as a substitute for both land and labour. By making it possible to produce more per unit of land and per hour of work, less land and labour are required for a given amount of output.

The agricultural sciences, dealing with the aims and problems of farm production, include soil cultivation, crop growing and harvesting, animal husbandry, and to some extent, the processing of plant and animal products to a marketable stage. (Encyclopaedia Britannica, 1968).

Wherever scientific methods have been applied, they have revolutionized agriculture. In prescientific agriculture, six people could produce barely enough food
for themselves and four others. In the frequent bad harvest years they could produce only enough for themselves. The application of scientific research and advanced technology has made it possible for five people to produce enough for 95 others. The farmer has been enabled to increase his yield per acre and per animal, reduce his losses from pests and spoilage, and maximize his net production by improving his processing. New techniques of preserving food products made it possible to transport them over greater distances, facilitating worldwide adjustment between production and consumption, with further beneficial effects on production efficiency.

Agricultural technology has developed more rapidly in the 20th century than in all previous history. Though the most important developments during the first half of this century took place in the industrial countries, the picture has changed somewhat since the 1950's. They have initiated large scale efforts to improve their agriculture.

New crops and techniques are, in reality, modifications of the old. Now they are grown in wider areas and have different uses from those of earlier times. The widespread of adoption of high yielding varieties, dry farming, irrigation, mechanization and other modern
techniques increasing productivity in many parts of the world.

The Indian economy is predominantly agricultural oriented. The significant feature of Indian economic life has been that about two thirds of its population is employed in agriculture. Nearly half of the country's income is derived from agriculture and allied activities. Though we are living in the industrial age, agriculture is the backbone of Indian economy. India produces a wide variety of crops. The scenario of Indian agriculture reveals distinct features and they are:

(i) cultivation of as many as number of crops indicating highly diversified cropping pattern,

(ii) high concentration of food grain crops rather than commercial and nonfood crops, and

(iii) hybridisation of agriculture, mainly in rice and wheat.

A critical assessment of the trends in agricultural development and of the factors determined them would, therefore, provide a crucial input in the formulation of a proper developmental strategy for the country. It may be noted that even after more than a decade of
Green revolution and a substantial increase in agriculture has yet not been able to break the chains of underdevelopment and food shortages still persist in some parts of the country (Bharadwaz, 1981). The reasons for such a state of affairs are not far to seek, first, a high population growth has accompanied the growth in production of food grains. Second, a high growth in agriculture production is concentrated in a few pockets (Bhallah and Alagh, 1979). The problems relating to the inadequacy and regional concentration of development in India need to be examined; though an integrated approach with a view to identify the pattern of agriculture and the trends of agricultural development in specific conditions in different regions of India.

The mounting pressure of population on existing resources has led to the rapid development of agriculture in the world. This has led to studies on various aspects of agriculture from various disciplines. Coppock (1981) is of the opinion that geographers ought to play a part in economic development by employing their skills in describing and understanding the existing use of agricultural resources and there by contributing to their more effective exploitation.
Inspite of the high proportion of the active population engaged in agricultural activities, there is a general concern with the low farm productivity due to unscientific utilization of agricultural land and other allied resources. Hence Indian geographers have long been studying the problems of landuse in the country with a view to findout ways and means for scientific utilization of land and allied resources to increase farm productivity. Such studies range from inventories of land use surveys to isolated topical or regional descriptive accounts of land use variation both in space and time. However, geographers have recently focussed their attention to assess quantitatively the changes which have been taking place in the utilization of various agricultural resources in order to maximize production.

The pattern of agriculture in India is more diversified and spatially variable. It is due to considerable spatial and temporal variations in climate resulting from differences in the rainfall characteristics, varying soils, topography, intensity of irrigation and other physico-socio-economic conditions. Collectively economy of India resulting in marked regional differences in the matrix of the geography of Agriculture.
Inspite of overwhelming importance of agriculture in India paradoxically enough, has remained poor because of stagnation in the subsistence in agricultural economy and under reliance upon it. The need of the hour is to understand the past and present state of agricultural resource in order to form a valid regional planning for future agricultural development. Therefore the landuse planning and agricultural planning are of basic importance for increasing pressure of population on land and growing demand for food and raw materials. There has been a growing desire to rationalise the agriculture in order to utilise every piece of land properly. This desire calls for scientific study of the utilisation of agricultural lands.

Since agriculture is the most common and widespread of the ways in which man gets his living and the geographers are primarily concerned with man's varied impact on the resource base. The geographical research needs to be devoted to the cause and effects, concentration and diversification and problems and prospects of agriculture of a region. By applying the techniques of survey, mapping, analysis and interpretation, which provide the correct base, where scientists from other disciplines may co-operate to evolve a rational land use and agricultural planning.
In India most of the studies made by geographers are on regional agriculture. Due to diversified nature of physico-socio-economic conditions in Indian subcontinent a unique agricultural planning is rather been invalid. In such conditions, regional studies on agriculture are more important to formulate valid regional agriculture and landuse planning.

In the present study, an endeavour is made to examine the changing cropping pattern of Nellore District, Spatial distribution of crops and in addition it is also to assess the modernization of agriculture in Nellore district. The changes in crop land use that took place during the decade from 1974-75 to 1984-85 on talukwise basis is attempted. For spatial distribution of crops, only one year i.e., 1987-88 has been taken and here mandal is the basic unit. Regarding to modernization of agriculture, 11 villages are randomly selected for survey, keeping the physiographic conditions and sources of irrigation in view.

It has been found that, Nellore district is one among the coastal districts which is influenced a lot by Green revolution and other modern methods of agriculture since 1970. Since agriculture is the main economic activity of the people, it is given
utmost priority in the Seventh V year plan. Availability of irrigation facilities, fertile soils, suitable climatic conditions, awareness of farmers, research and developmental activities of Government led the district towards modernization of agriculture. Along the coastal belt and Pennar delta belt more intensified agricultural activities are observed than interior parts of the district. It has been observed that the pattern of agriculture in the coastal and deltaic plains differs from interior uplands. Even changing climatic conditions are also affecting the cropping pattern in the district. For example the tobacco cultivation in the district. This is because the quality of tobacco is declining due to unfavourable environmental conditions. At present it is being replaced by other crops in most parts of the Nellore district. Paddy is the predominant crop cultivated in Nellore district. Nellore district stood first in the production of 'Molagolukulu', a traditional super-fine variety of paddy. It is considered as one of the best varieties of paddy, which can withstand the water logging conditions prevailing along the coast of Bay of Bengal. Favourable irrigation conditions enhancing the agricultural activities. Both kharif and rabi seasons are active here.
In view of its coastal location, Nellore District enjoying cool breezes of Bay of Bengal especially in summer comparing to the interior districts of Andhra Pradesh. Nellore district is having quite favourable climatic conditions. It being a cyclone prone area, it is very interesting to study the cropping pattern of the district. There are considerable low lying areas and some pockets are below the sea level and inundation is a common feature. Cyclones, gales and heavy rain followed by flood are an annual feature during September months, damaging vast crop stretches before or at the time of harvest.

**Objectives of the study:**

The main objectives of the present study are:

1. To bring out the spatial distribution of landuse and changing land use pattern.
2. To study the spatial pattern of crop farming for the year 1987-88.
3. To bring out the changes in the cropping pattern, if any, between 1974-75 and 1984-85.
4. To demarcate and delineate crop regions.
5. To examine the crop combinations.
6. To measure the degree of crop diversification, and
To assess the level of agricultural modernization in Nellore district.

**Scope:**

The present study clearly brings forth the changes in crop pattern, the level of modernization among farmers in this region. Based on the variation in the level of modernization suitable planning strategy could be envisaged in order to promote uniform development over the entire district. The study could form the basis for planning in this direction.

**Data Base:**

In any study, the methodology pertaining to collection, classification, analysis and interpretation of data is very important. In the present study both secondary and primary data are used.

**Secondary Data:** Statistical data pertaining to rainfall, general landuse, agricultural machinery, general cropping pattern, sources of irrigation data are collected from district planning office, meteorological department and Agricultural department offices in Nellore.

**Primary Data:** For the present investigation primary data is used to measure the level of modernization.
Primary data is collected using a pre-coded and pre-tested schedule. The schedule was intended to collect data, regarding the socio-economic characteristics and usage of modern inputs in agriculture by the farmers. All the 220 respondents in eleven selected villages were interviewed at their residence with the help of the schedule.

**Sampling** : About 220 respondents were selected randomly. Before that the district was stratified on the basis of relief and irrigation; the two factors that are pivotal in deciding the farming operation. At the first stage the entire district is divided into five regions on the basis of relief and irrigation. The five regions are the Pennar delta region, North coastal region, South coastal region, Interior upland region and the transitional zone between Interior upland and coastal lowland. From these regions eleven villages were selected on the basis of their location with reference to accessibility and types of irrigation available there. Thus totally eleven villages were selected reflecting various physical, socio-economic conditions of the region. From each of these villages twenty respondents were selected from various size class of land holding such as small, medium and large. Thus totally 220 farmers were selected and interviewed in their residences.
Techniques: In the present study both cartographic and statistical techniques were used.

The percentage analysis is used to bring out the changes in the intensities of the crop. The intensity of a crop is calculated as the percentage proportion of its area to the gross cropped area. As such the change in the intensity of a crop shows the relative change with reference to the gross cropped area not the actual change in the acreage under a crop. To bring out the clear scenario of spatial distribution of crop farming, crop regions, crop combination, crop diversification, relevant quantitative techniques have applied in the study. Some of these techniques like Bhatia’s method for crop concentration, Doi’s method for crop combination, Gibbs-Martin method for crop diversification and so on are employed.

Suitable cartographic techniques are employed to map the characteristics of rainfall, population, general landuse, irrigation, cropping pattern, crop regions, and crop combination.

Organisation of the Thesis:

The entire study is divided into eight chapters. In chapter II the geographical background of the study area, Nellore district, is attempted in
order to throw light on the understanding of the cropping pattern, and modernization. Here physiography, climate, vegetation, soil, irrigation, transport network, etc are being described in a nutshell.

The general landuse pattern, and their changes over space and time is discussed in chapter III. The changes in general landuse between 1974-75 and 1984-85 is discussed in detail. The concentration of each type of landuse on Mandal basis for the year 1987-88 is also analysed.

The spatial patterns of cropping pattern for important crops are being discussed in chapter IV. Further, the season-wise crop concentration and volume of change in each crop between 1974-75 and 1984-85 are discussed in the chapter.

In chapter V an attempt is made to show crop combinations and crop diversification for the year 1987-88 and changes between 1974-75 and 1984-85. The demarcation of crop regions is made in chapter VI employing ranking method of crops.
Chapter VII attempts to identify different levels of modernisation in agriculture on the basis of secondary data and primary data collected in the field. The levels of agricultural modernization is based on the usage of Hybrid seeds, fertilizers, pesticides, mechanical implements .... etc.

The last chapter of the study summerises the findings of this investigation.