Anantapur district in Rayalaseema region is geographically situated in an unfavourable natural zone and it is the driest part of the state of Andhra Pradesh. Being far away from east and west coasts, this district is deprived of the full benefits of both the monsoons and consequently droughts and famines have become a usual phenomenon. It receives the lowest average rainfall of about 550 mm compared to the state average of about 800 mm. In a total geographical area of about 19 lakh hectares of the Anantapur district, only seven lakh hectares are sown and 1,12,610 hectares are irrigated. Nearly 85 per cent of the population are affected by drought in this district, due to low rainfall, high temperature and severe dry winds during monsoon periods.

Water Balance is a basic concept in modern climatology and has been gaining importance in various fields of water management. With increasing population and decreasing per-capita availability of water, optimum utilization and conservation of water has become a problem of vital importance in which water balance plays a crucial role.

It is now well-established that the water supply to a region is primarily through precipitation and the water loss is almost entirely due to evapotranspiration. The wetness of dryness of a place is, therefore, determined by the relative magnitudes of precipitation and potential evapotranspiration, a term coined by C.W. Thornthwaite to denote the water need of any locality. The elements of water balance, namely, actual evapotranspiration, water surplus, water deficiency, moisture
adequacy and Aridity Index play an important role in hydrology, agriculture, forestry, ecology and drought intensity determination of a region.

According to Subrahmanyam (1982) Drought is defined as "lack of water sufficient to meet the requirements of a locality". The Meteorological Department of India has defined drought as a situation occurring in any area when the annual rainfall is less than 75 per cent of the normal. The agricultural meteorologists consider drought as a shortage of moisture for crop. The hydrologists view it as being responsible for depression of surface and underground water levels or retardation of streams flow. The economists define drought as water shortage which adversely affected the crop production and economy of the region.

Cropping pattern means the proportion of area under various crops at a point of time. A committee constituted by the Government of India in 1960 under the Agricultural Commission determined the cropping pattern according to relative acreage of various crops in a district or a group of districts (Agricultural Situation 1964). Cropping pattern also was determined by the spread of crops expressed as a percentage of total area, of important crops. It includes the identification of most efficient crops of the region which is considered a homogeneous of soils and climatic belt. Indian Council of Agriculture Research has Organised a symposium on "Cropping Patterns of India" in 1968 at Delhi to study the agronomic aspects of different regions in the country, problems of soil
fertility and fertility use in relation to cropping pattern, water use and soil management problems, engineering and power energy aspects of cropping pattern, land production problems and economic storage and marketing aspects of cropping pattern. Based on the proceedings of the symposium on cropping patterns in India the Committee has recommended for multiple cropping, plantations and intercropping, intensive cropping of vegetables and food crops, cultivation of root crops in sandy soils, seed certification programme, identification of agro-climatic soil regions and better storage and marketing facilities for various crops produced. It also has recommended to carry out detailed research activities on various research programmes of cropping pattern, which should emphasis an inter-disciplinary approach relating to number of crops irrespect of their suitability in intensive farming and its practices relating to better land use, soil and water management, pests and disease control etc. which would enable the maximum utilization of land and water resources.

Land embraces the atmosphere, the soils and under­lying geology, the hydrology and the plants, above and below a specific area of the earth surface. It also includes the results of past and present human activities as well as animals within this area, in so far as they exert a significant influence on the present and future uses by man. The planning of develop­ment land and readjustment is usually carried out in a number
of successive phases, namely, land evaluation, socio-economic analysis, classification and programme effectuation. Land evaluation includes both qualitative and quantitative classification. In developing countries like India where agriculture is the main economic activity the basic resources namely the land and water have to be properly augmented for better planning. Appraisal of resources and diagnosis of problems involved in management of the resource availability is particularly important in the areas of scarce resources. It has assumed much greater importance in India now with the acceptance of multi-level regional planning. Drainage basins or watersheds form most convenient, as well as most appropriate spatial units for the study of natural resources particularly the basic resources like land and water.

Water is a unique substance and it is essential for human, animal as well as plant survival. Agriculture requires vast quantities of water. In fact water is a vital source of energy and provides an important means of irrigation efficiency in food production. Neither the supply of water nor its distribution is uniform throughout the surface of the earth. This has resulted in an apparent imbalance between demand and supply of this vital natural resource. Some areas are blessed with a fairly uniform and more than adequate supply for human and agricultural needs, but many other regions have a greater need for water than supply. Generally water is a great demand in dry areas, considerable time and effort are spent by the inhabitants of such regions in searching for it.
The country is affected in different parts by drought and by flood havoc. This situation can be remedied only by evolving a water policy on a national level and resorting to comprehensive planning.

ORGANISATION OF THE THESIS:

The first chapter deals with the significance of the study, study area, objectives, sources of data, duration of the study and methodology. The second chapter contains a detailed account on the profile of the Anantapur district relating to location, administrative set up, relief, drainage, soils, minerals, climate, population, distribution, occupational structure, literacy, transportation and communication, industries, social welfare, health and medical facilities, agriculture, cropping pattern and places of tourist importance. In the third chapter an attempt is made to study the rainfall pattern on the monthly, seasonal and annual basis. In the fourth chapter, the decadal variation, mean rainfall, rainfall intensity, rainfall variability and rainfall ratio are brought out. In the fifth chapter the study on droughts, drought classification, drought intensity, and drought spread has been carried out on seasonal and annual basis.

In the sixth chapter a study on water balance elements on monthly, seasonal and annual basis and climatic classification has been brought out. The seventh chapter gives an account on land resources of the district based on physical characteristics of the district. In the eighth chapter a study on
ground water resources of the district has been carried out. The ninth chapter deals with the analysis of land use, irrigation and cropping pattern of the district. In the tenth chapter an attempt has been made to study the impact of various programmes under DPAP, IRDP, TRYSEM etc. on the economic conditions of the people living in the district and an attempt has been made to suggest a few measures for drought mitigation and crop management of the district. Finally in the eleventh chapter the summary and conclusions drawn out of the study of the district are represented.