CHAPTER- I
INTRODUCTION

Indian economy is basically an agrarian economy and even now nearly 68 per cent of workforce directly or indirectly depends on agriculture. Thus, it still provides large-scale employment opportunities as being a major contributing factor for this labour-surplus economy. However, agricultural stagnation and agrarian distress is a subject of widespread discussion in recent years. This has been projected in a high degree of instability in farm incomes which have serious implications on living conditions of the people living on agriculture. This is due to adverse weather conditions which affect crop yields leading to wild fluctuations in prices of crops. Many regions in the country are under the grip of economic and environmental stock. Though the economic and environmental stocks have affected the entire population depending on agriculture, its intensity is very high in rainfed agricultural regions. Reduction in agricultural incomes of the farmers in rainfed regions has been manifested in the form of suicides. The farmers in these regions are greatly affected by environmental vulnerability and poverty. Governing by all indicators, people living in rainfed agriculture on an average lag far behind the rest of the world in human well-being and development indices. A large number of regions in India are characterised as drylands when conventional rainfed agriculture is practised. In this context, many studies are conducted on the livelihood and poverty and the consequences of dependence on dry land agriculture with a focus on socio-economic aspects. Problems such as rural poverty and livelihood of small holdings differ from region to region and the intensity varies from person to person. Area specific and indepth studies on agrarian distress in dryland regions are a few in number and time has come for researchers and academicians to conduct detailed analysis of distressed conditions of farm households in dryland agriculture.
Dryland agriculture is a type of agriculture which solely depends on rain water and does not receive any additional water through irrigation at any crop stage. Dryland agriculture is synonymous with non-irrigated or rainfed agriculture. The term 'Rainfed' refers to a wide range of patterns from arid to humid conditions. This type of agriculture is also called dryland farming or dryland agriculture. Several previous studies have defined categorizing the rainfed areas. The importance of rainfed agriculture in India can be understood from the fact that only one third of the cropped area is irrigated and more than half of the cultivated area has been still left uncovered and dependent on rainfall.

Since the inception of planning process in India, researchers have identified three broad phases of agricultural growth. Until mid sixties increase in food production had occurred mainly through expansion of area under cultivation. In late sixties, Indian agriculture had experienced a technological breakthrough which heralded the economy into a more promising phase of Green Revolution from the point of view of boosting agricultural production. As for the benefits of green revolution, they were confined to well endowed farmers and regions. In recent years, there has grown scepticism among planners about the capacity of Green Revolution areas themselves to sustain growth, as crop yields are fast approaching the technological optima. Besides, the economic cost of technology in terms of investment in irrigation as well as other paid out costs are not only becoming expensive but also posing certain serious ecological and environmental problems. Gross Domestic Product in India has declined from 48.7 per cent in 1950 to 24.4 per cent in 1996-97 and further to 18.7 per cent in 2007

The crop production in the predominantly rainfed regions could not come under the purview of this technology and agricultural production in these regions retained the characteristic of year to year weather borne sharp fluctuations. This had resulted in accentuation of disparities in agricultural growth, especially between irrigated and rainfed regions. Consequently, agricultural researchers have
identified three major growth depressing characteristics of dryland agricultural areas, such as harsh physical conditions, low priority in developmental policies and investment, and inability to compete with stronger and more modernised and dominant part of the economy. Often these growth depressing characteristics get manifested in weather and price induced instability. Thus, in fact dryland populations on an average lag far behind the rest of world in human well being and development indicators. These regions are characterised by chronic poverty and unstable livelihoods with little prospect for increasing agricultural production and absence of alternative employment. Population pressure with limited chance for improvement in livelihoods coupled with devastation of natural resources are aggravating the poverty situation still deeply.

1.1 Constraints of Dryland Agriculture

Despite concerted efforts made in the past to improve the productivity by transferring improved technologies, gain in terms of higher yield and income have not been spectacular due to associated risks like aberrant weather, land degradation and poor socio-economic base of the farmers. Although a major constraint to dryland agriculture is deficient water, hazards such as insects, diseases, high winds and intensive rains can destroy crops in a matter of minutes or days. Farmers in dryland regions are often resource-poor and these regions are usually at low priority in terms of allocation of national resources. There are three constraints in dryland agriculture viz, physical, technological, institutional, infrastructural and socio-economic.

1.1.1 Physical Constraints

In dryland areas, the environment is often more limited in yield than even the genetic potential of the crops. The dominant features of rainfall in dryland regions are its limited quantum, spatial variability and unpredictability. This kind of irregular distribution of rainfall with its extreme variable can result in
substantial run-off and soil erosion. The extreme temperature does limit productivity in many dryland areas. Wind erosion is one of the geomorphologic processes that affects the processes in semi-arid regions and influences the very future of civilization. Wind causes soil erosion by completely removing top soil and soil fines and makes the soil infertile. Water erosion at some level is inevitable. Accelerated erosion reflects the activity of man. It occurs because of cultivation of sloppy lands. It results in movement of top soil from hill slopes to valley bottoms or to streams and reservoirs. Sub-soil is usually less hospitable to plant growth than top soil because of lack of nutrients and lower available water holding capacity. These factors contribute to a low water holding capacity which makes it more difficult to deal with the detrimental effects of erratic and limited precipitation. Erosion, both of wind and of water, has intensified these constraints. Soil hardening and crusting are very common in dryland soils and result in large amounts of run-off. When water runs off, there is less water available for producing biomass and less input of organic material into the soil, which makes maintenance of good soil physical conditions even more difficult.

All these above cited constraints, further give rise to serious problems related to soil characteristics which are strongly influenced by the climate in which soils develop, and the interactions of these characteristics with current climatic conditions are a major consideration in understanding the productivity of dryland soils. Other soil problems such as surface soil hardening, compaction by tillage implements, susceptibility to water and wind erosion, low fertility, shallowness, hardening, restricted drainage and salinisation also affect crop production. Soil chemical problems which include low inherent fertility, acidity, toxic levels of aluminium or other elements and low nutrient-holding capacity. Essential plant nutrients can be lost through surface run-off, erosion, leaching, and removal of plant materials. This kind of sub-optimum soil environment would greatly affect the cycling and transformation on nutrients present in organic form
leading to unstable biological activity in soils is generally much lower in dryland than in more humid zones. There is evidence of erratic rainfall, coupled with other agro-climatic conditions causing infertility.

1.1.2 Technological Constraints

Low native fertility is a widespread problem on sandy soils and on the lateritic ferruginous (iron-rich), medium textured soils in many countries. The lack of some micronutrients in specific deficiencies will intensify and spread as cropping systems intensify. The interactions between nutrients and water are very pronounced, resulting in inadequate response to additional water at low fertility levels and poor response to nutrient if water is not available for plant growth. Long-term breeding programmes for improved drought resistance and improving germ plasm for disease and insect resistance is another matter of concern and this activity and the development of cultivars that are tolerant to aluminum toxicity resulting from soil acidity are extremely important in dryland regions. Low crop and animal production in dryland farming is not necessarily the result of lack of scientific knowledge. Limited resource and facing risk to adopt several new techniques that require a shifting of household resources as well as learning a new practice thoroughly may extend over several seasons and have uncertain future payoff. For these reasons, technology adoption often proceeds slowly despite the potential benefits demonstrated at a research level. Choosing the optimum plant population and width of row spacing continues to be one of the most difficult challenges for dryland producers. Further, the constraints such as high or too low plant densities, contour ridging, tied ridges, water harvesting, organic and chemical fertilizers, green manuring, weed control, erosion control practices, agro-forestry etc, are also apparent in dryland farming. Lack of adequate animal and mechanical traction constrains crop production in many dryland regions. The size and complexity of equipments are not economically and socially acceptable to the farmers.
1.1.3 Institutional and infrastructural Constraints

A move toward more intensive farming system significantly raises the cost of production and unassured moisture supplies greatly elevate the risk level of making profit particularly in dryland areas. Institutions in rural areas could not ensure that all segments of the communities have access to credit at affordable terms. Affordable credit at affordable terms has not been provided to the farmers by the institutions. Another constraint the farmers face is marketing of their produce, at a better price. Unavailability of convenient transportation is also the constraint that the farmers frequently face. Too often, the resources allocated to drylands have been minimal, because primary attention has been focused on irrigated agriculture.

1.1.4 Socio-Economic Constraints

Population pressure affects the resource base extensively and intensively. Extensive pressure leads to conversion of grasslands and forests to cropland, with expansion normally progressing into less and less favourable areas. Land ownership patterns in many parts of the country are based on the culture inherited traditions and often provide for equal division of agricultural land among heirs. This often results in dividing land into small blocks. With small land parcels, use of machinery is much more difficult. Often the land division occurs up and down the slope, making it difficult to use sound soil and water conservation practices such as terracing, contouring and other methods of cross-slope farming.

To address the underdevelopment of agriculture in dryland areas, the Central and State Governments have come out with the following functional programmes for mitigating the sufferings of the people in dryland areas.
1.2 Rain fed Developing Programmes

The Government of India has accorded priority to the holistic and sustainable development of rainfed areas through an Integrated Watershed Development approach. The key attributes of the watershed approach are conservation of rainwater and optimisation of soil and water resources in a sustainable and cost-effective mode.

1.2.1 National Rainfed Area Authority (NRAA): The Government of India constituted the NRAA on 3 November 2006 to give focused attention to the problem of the rainfed areas of the country under the control of Ministry of Agriculture with the conditions of Ministry of Rural Development. Its mandate is wider than mere water conservation and covers all aspects of sustainable and holistic development of rainfed areas, including appropriate farming and livelihood system approaches. It would also focus on issues pertaining to landless and marginal farmers, since they constitute the large majority of inhabitants of rainfed areas.

1.2.2 National Watershed Development Project for Rainfed Areas (NWDPRA): This project was launched in 1990. At present it covers all the 25 states and two Union Territories. The twin objectives of NWDPRA continue to improve production and productivity in the vast rainfed areas and to restore ecological balance.

1.2.3. Soil Conservation in the Catchments of River Valley Projects (RVP) was launched by MoA(Ministry of Agriculture) in 1962-63. Subsequently another scheme of Integrated Watershed Management in the Catchments of Flood Prone Rivers (FPR) was launched in 1980-81. These schemes are primarily aimed at treating catchment areas, extending over more than one state, with appropriate soil and water conservation measures and to cover degraded arable and non-arable lands on watershed basis.
1.2.4 Shifting Cultivation: The Watershed Development Project in Shifting Cultivation Area (WDPSGA) was first launched during the Fifth Plan as a pilot project with cent per cent financial assistance from the Central Government, covering the whole of North Eastern Region along with Andhra Pradesh and Orissa and later on was transferred to the state plan sector. However, due to various reasons, the state governments discontinued the scheme with effect from 1991-92. On pressing demand from North-eastern states, the Planning Commission and MoA relaunched the scheme on watershed basis from 1994-95 onwards in seven North-Eastern states.

1.2.5 Reclamation of Alkali Soils: The scheme for Reclamation of Alkali Soils was launched in 1974-75 in the states of Punjab, Haryana and Uttar Pradesh and extended to the states of Gujarat, Madhya Pradesh and Rajasthan in the 8th Plan period. The main objective of the scheme is to reclaim land affected by alkalinity and improve land and crop productivity including development of horticulture, fuel wood and fodder species.

1.2.6 Watershed Development Fund (WDF): This fund has been established in 1990-2000 at the National Bank for Agriculture and Rural Development (NABARD), with the objective of integrated watershed development. The fund is to be utilized to create favourable conditions to replicate and consolidate the isolated successful initiatives under different watershed development programmes in the government, semi-government and NGO sectors.

1.3 Ministry of Rural Development (Department of Land Resources)

1.3.1 Drought Prone Areas Programme (DPAP): Drought Prone Areas Programme (DPAP) was launched in 1972-73 by department of Land Resources under the control of Ministry of Rural Development to tackle the special problems faced by areas constantly affected by severe drought conditions. The main objective of the programme is to minimize adverse effects of drought on the production of crops, livestock and productivity of land, to promote overall
economic development and improve the socio-economic conditions of the resource-poor and disadvantaged sections of inhabitants.

1.3.2 Desert Development Programme (DDP): The programme aims to mitigate the adverse effects of desertification and adverse climatic conditions on crops, human and livestock population, for combating desertification through shelter-belt plantation, pasture development, soil moisture conservation and water resources development and also to restore ecological balance.

1.3.3 Integrated Wasteland Development Project: (IWDP) was started in 1988-89 by the MoEF (Ministry of Environment and Forest) with an objective of development of wastelands based on village micro-watershed plans. However, the scheme was transferred to the Department of Wastelands Development (DWD) now called Department of Land Resources.

1.3.4 Externally Assisted Projects (EAPs): The Department of Land Resources, Ministry of Rural Development is also implementing EAPs, assisted by the donor agencies like DFID, EEC, CIDA and SIDA, in the States of Orissa, Andhra Pradesh, Haryana, Kerala, etc.

1.3.5 Technology Development, Extension & Training (TDET): This scheme was launched during 1993-94 with a view to promote the development of suitable technology for the reclamation of wastelands. Its main objective is to operationalise appropriate, cost effective and proven technologies for development of wastelands.

1.3.6 Investment Promotional Scheme (IPS): This scheme was launched in 1994-95 in order to promote participation of the corporate sector and financial institutions etc., with a view to enhance the flow of funds for the development of non-forest wastelands. The scheme has been reconstructed in August 1998 with a major thrust for the development of degraded lands belonging to small and marginal farmers including SCs and STs.
1.3.7 **Support to NGOs:** The objective of the scheme is to create awareness, encourage the application of appropriate technologies for the development of wastelands and provide training for increasing capability and capacity building. Extension and publicity are other components of the scheme. This scheme has now been transferred to the Council for Advancement of People’s Action and Rural Technology (CAPART).

1.3.8 **The Wastelands Development Task Force (WDTF):** The scheme was implemented using the services of ex-servicemen for development of 1200 ha of wastelands in ravines of Chambal in Morena district of Madhya Pradesh. The objective of the scheme was to develop wastelands through afforestation including soil and moisture conservation, plantation and protection.

1.4 **Ministries of Environment & Forests (MoEF)**

1.4.1 **Integrated Afforestation and Eco-development Projects Scheme (IAEPS):** The schemes implemented by the MoEF (Ministry of Environment and Forests) have relevance to sustainable eco-system development in rainfed or degraded areas in the country. This scheme has been implemented on watershed basis since 1989-90 with intention to promote afforestation and development of degraded forests by adopting an integrated watershed approach to development of land and other related natural resources through the micro-planning process.

1.5 **Research Problem**

Andhra Pradesh, the granary of India, has played a historic role in transforming India from a nation that was food deficient to one that is self-sufficient. The turnaround was so dramatic and achieved in a very short time that it was called a revolution, the Green Revolution. It is highly skewed in favour of certain regions and states. The Andhra Pradesh state with only 8 per cent of geographical area of the country has been contributing major proportions to national food reserves for the last few decades. Since the 1990’s, however the colour has been fading. After attaining an exemplary growth in production, agriculture in Andhra Pradesh has reached the crossroads from where sustaining
growth appears to be an arduous task. Many observers on agricultural issues in Andhra Pradesh paint a picture of decay and degradation of agriculture. Most of the experts have expressed persistent concerns and focused on the margin of profit from major crops and farm income. The agrarian economy of Andhra Pradesh today stands at crossroads. The majority (nearly 80%) of the cultivators and all the agricultural labourers are beleaguered by stagnation. A majority of small and marginal farmers have already been pushed below the poverty line.

In the state of Andhra Pradesh nearly 60 per cent of the net sown area in the state is under rainfed conditions. The depletion of ground water, degradation of soil health and soil texture, deterioration of ecology and environment in dryland agriculture are other very serious challenges that agriculture in Andhra Pradesh is facing. The existing cropping pattern and crop-technology in dryland agriculture offer no solution to these problems. This has led to the source of distress in agriculture, where the only source of income for the people is cultivation. This challenge which dryland agriculture faces today is also bound to have social effects. In fact, dryland agriculture in Andhra Pradesh has reached a stage where its viability and sustainability is in doubt.

After a spectacular growth rate during the seventies and the eighties, the Andhra Pradesh agricultural economy began to slow down in the late 1990’s and decelerated further during the 2000’s. Much of the growth slowdown originated from the dryland agricultural sector. A major portion of area in the state which is under rainfed suffered stagnation or poor growth. Thus, the Andhra Pradesh farm economy has reached at a stage rendering the fate of large agricultural population in doldrums.

There has been growing concern that declining rates of productivity growth due to diminishing growth in yields of the major crops, and degradation of
the water and land resource base. Owing to sheer stagnation in yield, the per
hectare return on land for major crops continues to decline. The per annum trend
growth rate of return from major crops, over variable cost had declined during
1990’s. This has further aggravated the problems of Andhra Pradesh agriculture
and farmers, in particular of dryland Agriculture and that of Andhra Pradesh
economy in general.

The growth of Andhra Pradesh agriculture depends to a large extent on the
potential of rainfed agriculture, which has not been harnessed effectively so far.
This characteristic among others has resulted in grave economic fallouts for the
farmers leading them to suicides among them. The economic and social problems
related to dryland agriculture are numerous, but it appears that the greatest
concerns today are the issues of declining livelihood conditions, which manifest
into various forms and with varied and complex results leading to social
implications also.

In spite of the policies and programmes that are being implemented over
the years, the factors and processes underlying the agrarian distress among dry
land farmers have found to be unaddressed. Inspite of huge investments in dry
land regions agricultural yields are more unstable in rainfed areas than those in
the areas where incretion is assured. Hence, incomes of the farmers are unstable
in rainfed areas. These areas are characterised by higher poverty than that of
irrigated areas. The measures taken by the government have not helped to raise
the income of the farmers and not reduced the poverty much.

The need to study the performance of dryland agriculture, its impact on
livelihoods of the farmers is therefore important for this research work to find out
rational answers to many questions which needed to be addressed. For instance,
despite the policies and programmes that are being implemented over the years, why is the fate of large agricultural population in doldrums? How is it affecting socio-economic network, what are the effects? This research work has attempted to shed some light on the above mentioned questions and issues. In addition this study had also attempted to give new recommendations or guidelines after assessing the research conducted. Future perspectives for the farmers have also been explored.

### 1.6 Research Justification

To delve into the reasons which led to agricultural distress are crucial in order to address the problem adequately. This assumes even more significance in view of importance of agriculture to the economy and farmers of the state. The need to study the functioning of dryland agriculture and resource management, with their impact on social and economic opportunities are, therefore of paramount interest in both academic and policy circles. Much has been written on the slow agricultural growth and termed it as stagnation but little information was available on the possible reasons in specific socio-economic settings. This study therefore attempts to present an insight view of the performance of dryland agriculture on the livelihoods of the farmers in dryland region. This study will also try to shed some light on the issue of social aspect, by finding out the relation between performance of dryland agriculture and poverty.

### 1.7 Need for the Study

Agricultural growth is one of the key factors in accelerating the over all development process of the Indian Economy. In spite of spectacular growth in terms of production and productivity of agriculture during the last five decades of planned development, it is highly skewed in favour of certain regions and states. A major part of the country, where crop cultivation is in rainfed areas suffered from stagnation or poor growth. Therefore agriculture in rainfed regions is
progressing very slowly or stagnates. Nearly 52 per cent of the net sown area in Andhra Pradesh is under rainfed conditions. The growth of state agriculture depends to a large extent on the potential of dryland agriculture, which has not been harnessed effectively so far. This has resulted in high poverty among many rainfed farmers. On the emerging context of Indian agriculture, the socio-economic status of the farmers and the people in rainfed agriculture assumes critical importance because of growing concern about the slow growth and persistence of poverty and backwardness. There has been an over all concern that over all living standards of the farmers in dryland regions have been on decline when compared to those of the people living in other regions.

Andhra Pradesh is one of the major agricultural states of India. It occupies positive position in terms of agricultural production in the country. The living standard of the rural class particularly in dryland regions has been on the decline. This is evident from the dwindling share of agriculture in state gross domestic product, from about 25 per cent in 1993-95 to about 13 per cent in 2008-09. The magnitude of the problem is clear from the fact that while the share of agricultural income has been declining drastically, the proportion of population dependent on agriculture has not declined in an equal proportion. That is, two thirds of state population has to share this dwindled income.

The plight of farmers in dryland region of the state has come into focus with the farmers in this region migrating to urban areas for want of wage employment. A mono-cropped rainfed production system does not provide employment throughout the year and migration has been the common phenomenon among the members of the farm families, even there is a good rainfed. It is comparatively higher in drought year. This clearly reveals the story of declining income of the farm families depending on rainfed cultivation.
Thus the situation of farming under rainfed condition in the state reveals a great deal about the agrarian conditions in dryland regions of the state. This situation is compounded by deterioration in the political and institutional support to dryland crops when compared to irrigated crops like rice, wheat and sugarcane. The low qualities of education and health care in rural areas have become contributing factors to poverty and backwardness.

The need to study the functioning of agriculture and resource management with their impact on ecological sustainability and economic opportunities are therefore of paramount interest in both academic and policy circles. Much has been written on the slow agricultural growth and termed it as stagnation but little information was available on the possible reasons in specific socio-economic settings. Recent works on this area are found in annual growth. This study therefore has attempted to present an insight view of the performance of dryland agriculture on the livelihoods of the farmers in dryland region. This study has also tried to shed some light on the issue of social aspect, by finding out the relation between performance of dryland agriculture and poverty.

This has been highlighted by a number of studies in recent times. A notable declanation in the rate of growth of agricultural production, area and productivity of dryland crops has been found. This is leading to the dwindling in income of the dryland farmers. Governing disparities between rainfed and irrigated agriculture have become matter of serious concern for the policy makers. Though, many studies are conducted on these aspects, problems such as rural poverty and livelihood of small holdings which differ from region to region and the intensity which varies from person to person, area specific and in-depth studies on agrarian distress in dry land regions of Andhra Pradesh are a few in number which are confined to limited area. So, it is proposed to conduct detailed analysis of distress conditions of farm households in dryland agriculture in Andhra Pradesh.
1.8 Research Aims and Objectives

The main objective of the study is to look into the performance of dryland agriculture and distress among farm households within the framework of economic and social perspectives. It has been studied by the help of certain social and economic parameters. The study focuses on these specific objectives.

➢ To examine the changing trends in economy of dryland agriculture.
➢ To analyse the growth in area, production and productivity of dryland crops.
➢ To analyse the economics of cultivation in dryland regions.
➢ To analyse the socio-economic status of farm families in dryland regions.
➢ To analyse the factors influencing poverty among farm households in dryland region
➢ To suggest ways to counter the present trend in agriculture and hence improve the situation of farmers and farming in dryland agriculture in the state.

1.9 Hypotheses

➢ The growth in dryland agriculture is stagnant.
➢ Dryland cultivation is not economical
➢ There is a close relation between dryland cultivation and poverty.

1.10 Scope of the study

This study is limited to the analysis of economics of dryland agriculture in the selected districts of Andhra Pradesh. The study area is characterised by low and erratic rainfall, poor fertility status of the soil, frequent occurrence of droughts and other natural calamities. The study focuses on the cropping pattern, area, production and productivity and the socio-economic conditions of the
farmers during the last three years, i.e., from 2005-06 to 2007-08. The study is
carried on 300 sample farmers belonging to different farming categories and to
different socio-economic status and of different agro-climatic conditions. That is,
they represent different strata in the universe. However, the size is selected at
random.

1.11 Research Methods

Within the above mentioned scope of the study, particular methodology
has been designed to carry out the research work in a scientific way so that a
comprehensive analysis may be obtained. In this regard the methodology applied
in the study besides the methods of sampling and way of determining the
sampling size is described in the following along with the methods and techniques
employed in the data collection.

1.11.1 Research design

The theoretical framework of this study combines economic as well as
social aspects with the distress in dryland cultivation. It deals with the relationship
between dryland cultivation and poverty. To study the evolution of the distress in
the dryland agriculture practice, regarding their sustainability of livelihood
practice, both quantitative and qualitative methods of research were applied in the
study through the collection of data by household survey and indepth interviews
as well as field observations.

1.11.2 Selection of study area

Andhra Pradesh is a state with diversified regional dimensions where
marked difference exists among the regions. Uneven and unparallel rainfall,
natural resources, irrigation, infrastructure and agro-climatic conditions are
distributed, besides agro-climatic variables which are critical to the performance
of agriculture. To acquire comprehensive understanding of the problems prevailing in agriculture in dryland areas and the constraints that the farmers face and analyse the same, a Multistage Random Sampling Method is employed. In the first step Andhra Pradesh which is divided into three regions, namely, Coastal Andhra, Telangana and Rayalaseema regions is selected.

A multi-stage random sample method is used to select 300 sample households from rainfed regions. In the first stage three districts are selected at random from the list of districts in each region in which more than 50 per cent of net sown area is under rainfed conditions. Thus, for the study, Mahaboobnagar from Telangana, Prakasam from Costal Andhra and Ananthapur district from Rayalaseema region in Andhra Pradesh are selected. In the second stage three mandals from every district are selected at random, from the list of mandals where more than 50 per cent of net sown area is dependent on rainfed. In the third stage three villages are selected at random, one from each selected mandal by following the criteria that net sown area depending on rainfed is more than half. Finally, farm households who are completely depending on rainfed crops in each of the selected village are listed by farm size. A proportionate sample of 100 farm households from different size groups are selected randomly from the list of farm households.

1.1.3 Data Collection and Statistical Techniques

This study is based on both Primary and Secondary methods of data. All the sample households were interviewed personally to collect the required primary data using structured questionnaire. The household survey was conducted to collect information on the socio-economic status which included employment, income and consumption expenditure and also access to basic amenities like safe drinking water, sanitation, school, transport, market, communication facilities etc.

Further, the information regarding the households, demographic information, system of cropping pattern, farm income and expenditure, and off-
farm income, input use, crop yield, cost and returns of different on-farm activities and availability of institutional credit and utilisation of Government schemes in the selected area was gathered. Perceptions of farmers on various issues relating to government schemes, programmes, loans and problems as well as measures for their upliftment were also included in the questionnaire.

The secondary data was collected from Directorate of Economic and Statistics, Government of Andhra Pradesh and from different reputed journals. Mandal and village level data was also collected from Mandal Revenue Offices in the selected districts.

The data collected was entered into the Statistical Package for Social Sciences (SPSS) version for the quantitative data, basic tools and methods in statistics. Statistics for data analysis consisted of descriptive statistics which include percentage values.

1.11.4 Techniques of analysis

The analytical technique used in this study is descriptive statistics and simple and logit regression analysis. Descriptive statistics form the basis of virtually quantitative analysis of data. Descriptive statistics are used to describe the basic features of the data in this study. To provide simple summaries about the data, simple tabular analysis is used. The simple regression technique is used to verify the relationship between variables. The logit regression analysis is used to analyse the factors influencing poverty among farm households. The cost of cultivation concepts applied in farm management studies are used to analyse the economics of crop cultivation. The detailed descriptions of the techniques are presented in respective chapters.
1.12 Limitation and Weaknesses of the Study

In the study, which revolves around economic and social aspects, substantial methodological problems can be incurred. While in the field, some problems encountered would be considered the weakness of the study. According to the requirements of research, the questionnaire which was constructed had many questions aiming at getting economic infrastructure of the farmers. On many occasions even after assuring the farmers, many thought that the researcher was from the tax department and were afraid of any kind of negative consequences on their earnings, so there are possibilities that the data particularly relating to economic dealing may be corrupted to some extent.

1.13 Organization of the study

Introduction, problem of the study, objectives and methodology are presented in Chapter I. Chapter II provides a review of the past studies related to dryland agriculture on various aspects made so far in different countries and different states of India. Agro-economic profile of the study area is presented in Chapter III. Chapter IV analyzes the trends in dryland cultivation in Andhra Pradesh. Economics of dryland cultivation is analyzed in Chapter V. Socio-economic dimensions of sample households are presented in Chapter VI. Incidence of poverty among selected farm household’s cultivation has been analyzed in Chapter VII. Summary, conclusions and suggestions are presented in Chapter VIII.