CHAPTER I
INTRODUCTION

1.1. Statement of the Problem:

In Indian economy agriculture occupies the prime place as it contributes to overall economic growth. Hence, sustained improvement in agricultural productivity goes a long way in the growth process and improving the standard of living of population. To attain higher levels of agricultural productivity, adoption of new farm technology by way of application of High Yielding Variety seeds (HYV), chemical fertilizers, pesticides etc., becomes necessary. However, modernisation of agriculture through application of new farm technology is confined to selected regions or areas, resulting in marked inter-regional and inter-district variations in productivity, resulting in regional inequalities in the levels of income. For instance, the average yield per hectare of rice in Punjab was 3,199 kgs., whereas in Rajasthan it was only 908 kgs. during 1985-86. Even in regard to the average yield of total foodgrains, it is highest in Punjab State (i.e. 3,195 kgs.) and lowest in Rajasthan (i.e. 631 kgs.). Likewise, with regard to groundnut, the yield per hectare is highest in Orissa with 1,417 kgs. and it is only 250 kgs. the lowest in Gujarat.¹

In a study Bhall and Alagh\(^2\) have examined the spatial variations in the distribution of high, medium and low levels of agricultural productivity, measured in terms of the value of output per hectare during 1970-71. Out of the total of 282 districts studied in India, only 42 districts have very high agricultural productivity per hectare (Rs.1600 and above), 15 districts show high productivity (Rs.1200-1400), 49 districts indicate medium productivity (Rs.974-1200), as many as 93 districts fall in low productivity category (Rs.600-974) and 57 districts in very low agricultural productivity (below Rs.600 per hectare). On reviewing the picture state-wise, Punjab fares best (9 out of total of 11 districts belong to very high productivity level), followed closely by Kerala (5 out of a total of 6) and by Tamilnadu (7 out of a total of 11). The situation of Karnataka (5 out of a total of 19) and Andhra Pradesh (4 out of a total of 17, i.e., West Godavari, Chittoor, East Godavari and Krishna districts) is not bad nor is the situation in West Bengal, Assam and Haryana discouraging. But the worst picture emerges from some of the remaining states. Rajasthan (26 out of a total 26 belong to low productivity level), Madhya Pradesh (42 out of a total 43 districts), Maharashtra (21 out of a total of 26 districts), Gujarat (13 out of a total 18 districts),

---

Andhra Pradesh (10 out of a total of 17) and Bihar (7 out of a total of 15 districts). Hence, enhancing the level of agricultural productivity in the low productivity districts of the states will demand the serious attention of our planners.

In order to have a broad perspective on variations in the growth of productivity, S.B. Sawant examined the productivity trends in the country (India) as a whole and within the country at the state level. For instance, the productivity growth rate of rice was 2.10 per cent during 1949-50 to 1964-65, 1.21 per cent during 1967-68 to 1975-76 and it was 1.51 per cent during 1967-68 to 1981-82 in India. However, there were marked inter-state variations in the growth rate of rice productivity during 1967-68 to 1981-82, which are 6.04 per cent in Punjab, 5.05 per cent in Haryana, 4.49 per cent in Gujarat, 2.60 per cent in Andhra Pradesh, 2.22 per cent in Uttar Pradesh and only 1.75 per cent in Tamil Nadu which were above the average of All India level i.e., 1.51 per cent. Similarly, within the state the inter-district variations in the growth of productivity as well as production are quite common.

Agriculturally better endowed regions achieve higher farm production and productivity and the less endowed ones are found to be lagging behind. To quote an observation made in the Seventh Plan document "the bulk of increase in output particularly foodgrains has been concentrated in a few regions which are well-endowed with infrastructural facilities like surface irrigation, rural electrification, roads and markets and where farmers are resourceful". 4

In the process of agricultural development a series of programmes were initiated such as, Intensive Agricultural Development Programme (IADP), Intensive Agricultural Area Programme (IAAP) and the High Yielding Variety Programme (HYVP). However, the problems of inter-regional and inter-district variations in agricultural productivity, instability in agricultural production etc., cause great concern. For instance, within the Andhra Pradesh, rice productivity which stood at 2,639 kgs. per hectare in West-Godavari district was the highest and 1,072 kgs. in Vishakapatnam was the lowest productivity during 1985-86. Likewise, Nellore district recorded the highest productivity of groundnut at 1,529 kgs. per hectare and Anantapur district had the lowest productivity at 756 kgs. during the same period.

And it is against this background, planning in India has set as one of its objectives to minimise both inter-regional and intra-regional inequalities. The regional variations existed in all countries at all times and it is impossible to achieve perfect regional equality because of the simple fact that the resource endowments and human skills are unevenly distributed over different regions of a country or state or district and added to this mobility of factors is imperfect.

The inter-district variations in agricultural productivity and production contribute to income inequalities which, in turn, leads to poverty in some areas. For instance, the growth rates in gross agricultural value varied between district to district within Andhra Pradesh, which are 5.34 per cent in Nellore, 4.79 per cent in Karimnagar, 3.89 per cent in Nalgonda, 3.44 per cent in Prakasam, 3.19 per cent in East-Godavari, 3.15 per cent in Mahabubnagar, 3.04 per cent in Medak, 2.88 per cent in Nizamabad and 2.44 per cent in West-Godavari are only the above averages of Andhra Pradesh gross agricultural value, i.e., 2.37 per cent during 1967-68 to 1980-81. Hence, the need for an increase in agricultural productivity which

helps to increase the per capita income and thereby perhaps the rate of savings. Therefore, it is appropriate to demarcate the areas which suffer from low agricultural productivity and measures be suggested for planning irrigation development, communication, storage facilities and marketing aspects, in order to step up agricultural productivity. It is also observed that "the key to progress in any country is found to be in progressive improvements in productivity of resources". 6

In India since planning is carried out at the state level, the available data reveals that the inter-state imbalances and therefore regional variations at the district level are not properly brought into focus. Therefore, to analyse the inter-district variations in agricultural growth, growth rates of area, production and productivity have to be studied in depth. The different factors accounting for inter-district variations in agricultural productivity have to be identified. The extent of impact of such factors on productivity has to be examined carefully. This study is an attempt in this direction.

1.2 The Problem of the Rayalaseema Region:

Of the three regions in the State of Andhra Pradesh, Rayalaseema region is considered to be the most backward. Inter-district variations in agricultural productivity is the striking character of the region. For instance, within Rayalaseema, rice productivity varies from 2,115 kgs. in Chittoor district to 1,730 kgs. in Kurnool district, Jowar productivity from 1,134 kgs. in Cuddapah district to 719 kgs. in Chittoor district, Bajra productivity from 1,251 kgs. in Cuddapah district to 292 kgs. in Kurnool district, Redgram productivity from 190 kgs. in Kurnool district to 106 kgs. in Anantapur district, Horsegram productivity from 415 kgs. in Chittoor district to 199 kgs. both in Kurnool and Cuddapah districts and Groundnut productivity varies from 988 kgs. in Chittoor district to 583 kgs. in Cuddapah district during 1984-85. Further, the Rayalaseema region, located in an unfavourable natural zone, is deprived of the full benefits of both the monsoons. The average rainfall recorded in this region is comparatively low at 672 mm as compared to that of Coastal Andhra (i.e., 1,000 mm) and Telengana (i.e., 893 mm) regions. Owing to frequent failure of rainfall, this region has been declared a part of famine zone in South India. The net irrigated area in Rayalaseema

-----------------------------

is about 19 per cent of the net cropped area which is also less than that of Coastal Andhra (56 per cent) and Telengana regions (23 per cent). Thus, low level of rainfall and less irrigated area to net area sown have led the farmers to raise mostly dry-crops viz., Jowar, Bajra, Redgram, Horsegram, Groundnut etc., the major crops in this region. The food crop like rice is confined to limited pockets under well irrigation as a major source. The two canals viz., Kurnool-Cuddapah (KC canal) and Thungabadra High Level Canal (T.B.H.L.C.) have been the other important sources of irrigation for raising rice crop in Rayalaseema region.

Thus, the uneven distribution of natural and physical endowment, climatic and soil conditions and in the use of technology in farm operations have led to marked inter-district variations in agricultural production and productivity within the Rayalaseema region particularly, in dry areas the inter-district variations in agricultural productivity are causing concern, due to uncertain monsoon. It is aptly remarked that 'inspite of the recent advances in the technology of crop production, Indian agriculture is still dependent on rainfall. The fate of millions of farmers is determined and shaped by the distribution of rains. This is more true with rainfed agriculture. In most of the unirrigated tracts of the country, farming is a gamble
where the outcome is uncertain. Hence, the problem of inter-district variations in agricultural productivity necessitated the conducting of indepth studies, to identify the magnitude of inter-district variations in the dry areas. And it becomes apparent that the imbalances in agricultural productivity have to removed or corrected. Therefore, the focus of this study is on the districts of Rayalaseema region of Andhra Pradesh. The present study is an attempt to examine the inter-district variations in agricultural growth and identify the factors accounting for inter-district variations in agricultural productivity/growth and identify measures to minimize such variations.

1.3 Review of Literature:

Some studies have been undertaken with country or state as a unit for the measurement of regional imbalances in agricultural productivity. However, a few of the researchers have analysed the variations in agricultural growth at the level of districts also. But in these studies the emphasis was laid more on the aggregate picture, and variations at the disaggregated district level were observed in a cursory manner. Hence, there is a need for studies,

to discuss indepth, the inter-district variations in agricultural productivity/growth. Here, we shall critically review some selected studies.

Most of the studies analysed the importance of Technical, Institutional and Economic factors in explaining the variations in agricultural productivity. However, the influence of a particular factor's contribution to the variation in productivity is dependent upon the agro-climatic features and resources of the region or state. For instance, one region may have more fertile land than other and the quality of inputs used may differ between the two regions. Hence, physical and climatic factors also play a significant role in explaining the regional variations in agricultural growth or productivity.

Venkata Reddy⁹ has considered (a) institutional factors (b) favourable adjustment of economic factors and (c) application of science and technology as important factors influencing productivity. According to his assessment of agricultural progress during 1956-57 and 1970-71 in Andhra Pradesh, poor progress in area under HYV seeds, lower

---

level of fertilizer consumption, heavy damage to crops caused by floods and poor drainage in deltaic districts and lack of assured irrigation in the arid tracts of Rayalaseema and Telangana regions are the causes for low agricultural productivity.

The Indian Society of Agricultural Economics, considered the problem and published a series of articles under the broad title "Regional Variations in Agricultural Development and Productivity". Several researchers have selected different factors (inputs) in explaining regional variation in agricultural growth or productivity. Among the major contributors, Chaterji and Maitreya\textsuperscript{10} considered the area under the crop, area under irrigation and use of modern inputs etc., as determinants of the levels of agricultural development and productivity during 1950-51 to 1957-58 in the state of West Bengal, examining only two principal crops viz., Rice and Jute.

Dhondyal\textsuperscript{11} has measured variations in agricultural development and productivity by selecting three representative districts from the three regions of the Uttar Pradesh while


assessing the role of credit, intensive crop enterprises and the influence of irrigation water during 1962-63. He concluded that the capacity and willingness to borrow money for productive use is an important factor in accounting for regional differences in agricultural growth.

Dandekar, in the light of the papers submitted at the seminar on "Regional Variations in Agricultural Development and Productivity", has drawn the conclusion that, the extent of irrigation and use of fertilizers might explain a good part of the existing variations in agricultural productivity. Besides these technological factors, the institutional factors such as land tenure and agricultural credit were deemed relevant determinants.

Sapre and Deshpande have examined the impact of selected inputs on productivity in Maharastra state. They constructed the composite index of productivity for different crops under study as dependent variable and rainfall, irrigation and soil as independent variables, were fitted to a regression equation in order to ascertain the influence of the three factors on productivity. Finally, they concluded


that 48 per cent of variations in productivity are explained by the three factors, but rainfall alone explains 40 per cent of variations and relation between productivity and soil (input) was found to be statistically not significant.

Gopalakrishna and Rao have studied the degree variations in Andhra Pradesh with respect to the value of agricultural output per acre, output per head of agricultural population and attempted to account for causes of variations in each of the twenty districts of the state during 1959-60. They have also examined the functional relationship between the value of output per acre and associated variable viz., percentage of irrigated area and percentage of area under foodgrains and fodder by fitting multiple regression as follows:

\[ Y = a + b_1 x_1 - b_2 x_2 - \ldots - b_n x_n \]

Where, \( Y \) is value of output per acre and \( x_1 \) and \( x_2 \) are input variables. Finally, they concluded that among the two input variables, irrigation ought to be judged as an important factor affecting the value of output per acre whose 't' value is significant at 5 per cent level and is not significant with respect to other variable.

-----------------------
The role of socio-institutional factors, rather than physical factors, in explaining regional variation in agricultural growth has been highlighted in a paper by V. Nath (1970) who stressed the importance of land reforms, development of co-operatives and expansion of infrastructures like communication and rural electrification.

Many writers like Rao, C.H.H., Tamarajakshi, Kaul and Johl, Raj, K.N., have tried to explain inter-regional differences in growth rates of crop-output in terms of differences in the level of irrigation.


In a study Rao, examined that the inter-state variation in growth of output in the selected states in India has been explained in terms of inter-state differences in the level of irrigation. And as much as 70 per cent of the variation in growth of output was contributed by irrigation alone.

The Indian Society of Agricultural Statistics also conducted a symposium on "Regional Imbalances and Economic Development with special reference to Agriculture" and published several papers. Among the major contributors, Sharma considered that imbalance in the distribution of land among households in various regions of West Bengal, Bihar and Orissa might explain the regional imbalance in agricultural development. And allocation of funds for systematic evaluation of ground water resources for the development of irrigation and expansion of inputs associated with it had a vital bearing on increasing the level of agricultural output.


Raheja et al., 22 have studied the regional variations in adoption of high yielding varieties and their productivity with the help of 'Sample surveys for assessment of high yielding varieties programme' during 1973-74 covering 88 districts spread over 15 states of the country, examining two major cereals viz., rice and wheat. For rice crop, it was observed that the extent of adoption of HYV in different regions had no direct bearing on their yield rate, but owing to lack of assured water supply and resource endowments of the cultivators, the regional variations were more marked compared to wheat.

Singh et al., 23 made a study of variation in the crop yield and some of the selected inputs eg., fertilizer, gross irrigated area and area sown more than once for various states. They have concluded that the inter-relationship among yield of food grain and various inputs viz., application of fertilizer, proportion of area sown more than once and gross area irrigated might be high.


Das, in a study, examined that, the uneven distribution of the level of irrigation and fertilizer consumption and area under high yielding strains (in summer) account for increasing regional disparity in agricultural growth in Orissa state. Again Johar and Raikhy have studied the factors accounting for inter-district variations in agricultural productivity in Punjab and concluded that more than 70 per cent variation in yield is explained by variation in the level irrigation and fertilizer or HYV use and fertilizer. But Bawa and Parmindar Singh viewed that 61.62 per cent of inter-district variations is due to difference in availability of power, roads and level of literacy and 34.57 per cent because of irrigation, chemical fertilizers, factor availability and credit and 3.17 per cent on account of differentials in availability of labour. Variations can be narrowed down to the extent of 61 per cent by providing uniform infrastructural facilities and another 29 per cent by making use of available inputs.


Bhalla and Alagh in a district-wise study of 277 districts in India, have considered the average (NPK) fertilizer consumption, area irrigated and Gini coefficient of land ownership as important independent variables which contribute to variations in the agricultural productivity per hectare. By applying multiple regression equation considering the agricultural productivity levels (1970's) as dependent variable and fertilizer, irrigation (per cent) and Gini coefficient ratio (1971) as independent variables, it is examined that the variable fertilizer used alone explains 29.9 per cent variation in agricultural productivity per hectare and the contributions of irrigation and Gini coefficient ratio is positive but insignificant.

Sudhin has considered that the sources of variation in Agricultural productivity is explained by the differences in the level of input use (measured inputs), region effect (soil and topography) and temporal effect (rainfall, pests and diseases etc.). By constructing the dummy variables for region effect and temporal-effect for 72 districts of Madhya Pradesh, Uttar Pradesh, Punjab, Rajasthan and Haryana

during 1959-60 and 1968-79, a cross-section time-series analysis is employed and it is observed that only a small proportion of the variation in output is explained by measured inputs i.e., 41 per cent, whereas decomposing the large residuals into two components i.e., regional effects and temporal effect, (or random) 95 per cent of variations of the total disturbances are attributed to the region-effects.

Shafi\(^{29}\) has made an analysis in order to determine the relationship amongst a number of factors which may cause spatial variations in agricultural productivity. A series of nine independent input variables were selected viz., (1) area irrigated by canals (2) irrigation by tube wells (3) irrigation by other sources (4) area under HYV (5) fertilizer consumption (6) agricultural workers (per thousand hectars) (7) animal power (8) tractor power and (9) agricultural credit advanced (in Rs.). With the help of standard nutrition techniques, he constructed the productivity index for wheat crop as dependent variable. He fitted an equation of multiple regression analysis to study the impact of the nine independent variables on productivity variation

---

during 1966-67 and 1975-76 in Uttar Pradesh. Finally, he concluded that irrigation by canal, irrigation by other sources, fertilizer consumption and agricultural labour are the important determinants accounting for variations in productivity whose values are statistically significant.

Lakshmana Rao, has studied that during 1980-81 the inter-state (selected states) and inter-district (Andhra Pradesh) variations in foodgrain yields were explainable in terms of differences in irrigation potential, fertilizers use, size of operational holdings and rainfall as revealed by the correlation analysis using state-wise and district-wise data.

Keeping these observations in view, a modest attempt is made in the present study to measure inter-district variations in the Rayalaseema Region of Andhra Pradesh for a period of twenty-nine years, from 1956-57 to 1984-85. The multiple regression technique is fitted to the data to know the relative importance of the factors contributing to variations in agricultural productivity. However, the existing literature forms the basis for the selection of indicators and methodology adopted in the present study. The present

study makes a humble attempt to fill the research gap pertaining to the study of intra-regional variation in regard to agricultural productivity in the Rayalaseema Region of Andhra Pradesh.

1.4 Design of the Study:

In order to explain the inter-district variations in agricultural productivity the study makes an attempt to examine the growth rates of area, production and productivity of selected crops district-wise in Rayalaseema Region, region-wise in the state of Andhra Pradesh and Andhra Pradesh as a whole. The analysis of trends covers the 29 year period from 1956-57 to 1984-85, as well as the sub-periods from 1956-57 to 1964-65 (pre-green revolution period) and 1965-66 to 1984-85 (green revolution period). A comparison was made for growth rates of area production and productivity between pre-green revolution period and green revolution period to study the impact of green revolution on agricultural growth. This exercise is confined to six major crops, that is to say three crops from major cereals viz., Rice, Jowar and Bajra, two crops from pulses viz., Redgram and Horsegram and remaining one crop from the major oil seeds namely Groundnut. These crops represent both irrigated and rainfed crops and also important food and commercial crops grown in
the region. The area covered by these crops to total cropped area is about 60.1 per cent in Kurnool district, 72.8 in Anantapur district, 73.7 per cent in Cuddapah district and 79.6 per cent in Chittoor district within the Rayalaseema region. But Rayalaseema region as a whole covers 71.5 per cent, 63.7 per cent in Coastal Andhra region and 64.6 per cent in Telengana region against to 66.7 per cent in Andhra Pradesh state as a whole to its total cropped area. 31

This study is undertaken with a view to examining the inter-district variations in agricultural productivity. An attempt is made to identify the factors accounting for such variations in agricultural productivity. Furthermore, the study makes an attempt to study the extent of contribution of selected inputs (factors) on agricultural productivity variations during 1965-66 to 1984-85, district-wise in Rayalaseema region, Rayalaseema region as a whole and in Andhra Pradesh. And an attempt is also made to examine the extent of crop failures and crop loss-ratios on production and productivity of selected crops under study.

31. Andhra Pradesh, Government of Bureau of Economics and Statistics, Season and Crop Reports. These percentages are the averages of five years period ending with 1984-85.
1.5 Sources of Data:

This study relies on officially published statistics available from different publications, including Reports of the Bureau of Economics and Statistics, of the Departments of Agriculture, Irrigation, Planning and Cooperation of the Government of Andhra Pradesh and of the Ministry of Food and Agriculture, Government of India. The decennial census reports are also utilised, wherever necessary.

This study, however, has certain limitations. In a study like this covering a fairly long period of more than two and a half decade, for the four districts in Rayalaseema, three regions and the state, there is no other alternative but to necessarily depend on officially published data. It is not without relevance to refer to time lag in the publication of official statistics. However, available latest data have been utilised. And the concept of productivity is used in terms of yield per hectare (average yield) of different crops. The study is not extended to costs and returns analysis at the micro level. Production and productivity trends are not assessed in money terms either, as this study covers a 29-year long period and money values are proverbially illusory, if not misleading.
In this study an attempt is made to identify the factors for inter-district variations in agricultural productivity. Among several factors, the analysis is confined to selected factors viz., rainfall irrigation, fertilizer consumption and agricultural credit, which account for inter-district variations in agricultural productivity in Rayalaseema region. The extent contribution of the selected factors to the productivity variations of rice, and groundnut crops have been worked out. And the impact of rainfall on production and productivity of dry crops like jowar, bajra, redgram, horsegram and groundnut is separately calculated and critically examined. In addition, the micro-level case studies and taluk or mandal level studies were not explicitly brought out and examined because of non-availability of comparable published data for the period under study. Also, for an individual scholar such exercise of micro level is too heavy to attempt.

1.6 Objectives of the Study:

The main objectives of the study are:

1. to examine the inter-district variations in the growth rates of area, production and productivity of selected crops in Rayalaseema region and analyse such variations in comparison with those in other regions of Andhra Pradesh and the state of Andhra Pradesh as a whole;
2. to identify the different factors accounting for inter-district variations in agricultural productivity;

3. to examine the extent of contribution of selected inputs (factors) to productivity;

4. to examine the extent of 'crop failure and crop loss ratios' in production and productivity of selected crops under study and finally;

5. to suggest measures for increasing productivity in less favourable areas so as to reduce the inter-district variations and achieve higher levels of Agricultural productivity.

1.7 Methodology:

In order to bring out the inter-district variations in agricultural development, the linear and compound growth rates of area, production and productivity are worked out for rice, jowar, bajra, redgram, horsegram and groundnut for four districts viz., Kurnool, Anantapur, Cuddapah and Chittoor in Rayalaseema region, for the three administrative regions viz., Rayalaseema, Coastal Andhra and Telengana in Andhra Pradesh and for Andhra Pradesh state as a whole. Diagramatic presentation is also attempted showing the year to year fluctuations in area, production and productivity of the crops under consideration during the period under study. To study
the impact of the Green Revolution, if any, on agricultural growth, the growth trends are worked out for three separate periods viz., (1) the pre-Green Revolution period (1956-57 to 1964-65) (2) the Green Revolution period (1965-66 to 1984-85) and (3) the whole period (1956-57 to 1984-85). Further, the study attempts to examine the relative contribution of area and productivity to the growth of production of the crops under study during 1956-57 and 1984-85. This attempt is based on the reasoning that, "if productivity remained constant, output would grow at the same rate as that of growth rate of area. Therefore, the growth of output attributable to productivity would be the difference between the growth rates of output and area".  

To examine the inter-district variations in growth rates of area, production and productivity, the average of three years of the first actual figures are taken from season, and crop reports and statistical abstracts of Andhra Pradesh Government and index numbers were constructed for area, production and productivity to the inclusion or omission of years with unusual seasonal fluctuations. An attempt is made to examine the year-to-year fluctuations in area production.

and productivity of all selected crops under study, the
coefficient of variation technique has been adopted.

In reviewing the inter-district variations in agricultural
growth rates, an attempt is made to find out the factors
accounting for such variations in agricultural productivity/
growth. To test an explanatory hypothesis that the inter-
district variations in agricultural yields/growth are
explainable in terms inter-district differences in respect
of selected factors viz., rainfall, irrigation, fertilizer
consumption and agricultural credit, the rank correlation
coefficient technique has been used in order to identify
the significance of each individual factor, influencing
the productivity level.

In order to measure the extent of the contribution
of selected inputs viz., rainfall, irrigation, fertilizer
consumption per hectare and agricultural credit, on the
productivity variations of rice and groundnut, the technique
of multiple regression equation has been used and results

33. The same technique was used by Lakshmana Rao, V., to
analyse the inter-state and inter-district differences
in the average yields of foodgrain and their determinants

34. These techniques are used by Sapre, S.G., and Deshpande,
V.D., "Inter-District Variations in Agricultural Efficiency
in Maharastra State", Indian Journal of Agricultural
are examined for all the four districts in Rayalaseema, for Rayalaseema region as a whole and for Andhra Pradesh state during 1965-66 and 1984-85. Further, the impact of rainfall on production and productivity of dry crops viz., jowar, bajra, redgram, horsegram and groundnut has been worked out for each district in Rayalaseema, Rayalaseema region as a whole and for Andhra Pradesh state during 1956-57 and 1984-85. The year-to-year fluctuations in production and productivity of rice and groundnut crops in relation to year-to-year rainfall are depicted graphically. And, the techniques of crop-loss ratio and probability of crop failure have also been used to measure the magnitude of instability in crop production and productivity for the whole period.

1.8 Chapter Scheme:

The study is presented in six chapters. The first chapter outlines the importance and scope of the study, covering among others, the review of literature, methodology and design of study and limitations of the study. Chapter two presents the importance of agriculture in economic

35 These techniques are used by Nadkarni, M.V. and Ghosh, P.K., "Instability in Rainfall and Agricultural Yields in Drought-prone District (Tumkur)", Indian Journal of Agricultural Economics, Vol.XXXIII, April-June, 1978, No.2, pp.39&40.
development with an outline of the theoretical background. Different facets and the role of agriculture in economic development are discussed here. The agro-economic profile of the Rayalaseema region is presented in chapter three. The physical and climatical conditions, socio-demographic features, the extent of irrigation and sources of irrigation, the frequency of drought conditions, the cropping pattern and economic infrastructure are comprehensively discussed. Chapter four aims at analysing the inter-district and inter-regional variations in growth rates of area, production and productivity of selected major crops in the four districts of Rayalaseema, in three regions of Andhra Pradesh and Andhra Pradesh state as a whole. The linear and compound growth rates of area, production and productivity of the six crops under consideration are worked out in three sets, (1) pre-Green Revolution period (2) Green Revolution period and (3) the whole period of 29 years under study. The contribution of area and productivity to the output has been examined and critically analysed. Further, the co-efficient of variation is calculated for area, production and productivity in three-sets for the periods said above and examined. Chapter five is divided into two sections viz., Section A, and Section B. In Section A an attempt is made to examine the selected factors accounting for inter-district variations
in agricultural growth rates. Section B attempts to measure the extent of contribution of selected factors to productivity variations at the inter-district level in Rayalaseema region and Andhra Pradesh state as a whole. The relation between each individual input and productivity is examined and critically analysed. Again, the relationship between deviation of the actual production and productivity from the linear trend value and the deviation of the actual rainfall from the normal rainfall has been closely observed and analysed in this chapter. Further, probability of crop failure and crop-loss ratio are also worked out and critically examined. Finally, chapter six presents an integrated picture of the major findings and an outline of the suggestions for reducing inter-district variations in agricultural productivity/growth, and for achieving higher levels of growth.