The shares of cereals like jowar, bajra and maize under rainfed cultivation have been more or less stagnant; the share of rainfed groundnut in total groundnut area has decreased from 93.25 per cent to 86.37 per cent. Similarly the share of rainfed cotton has decreased from 99.41 per cent to 81.63 per cent. The shares of rainfed pulses like redgram, greengram, blackgram and bengalgram have been almost stagnant.

The agricultural growth in Andhra Pradesh can be measured in terms of area, production, productivity of major crops. The growth indicators of selected crops in dryland regions found to be fluctuating widely. These fluctuations will have direct and indirect impact on socio-economic conditions of the farmers.

8.8 Economics of Dryland cultivation

The analysis has been carried out with respect to the impact of dryland cultivation on resource use and farm business at the aggregate level i.e. all crops put together. However analysis at the disaggregate level, i.e., individual crops also carried out to throw light on the relative impact on resource use in dryland cultivation of different crops. An attempt has been made to examine the resource use and economics of predominant dry crops in the study area, i.e., cotton, chillies, redgram, greengram, groundnut, jowar and sunflower crops in the study area. The analysis has established that the intensive use of modern inputs in dryland cultivation, as per acre investment by all cost concepts is high among large farmers when compared to the other four farming categories. Farm size has also altered the total costs structure, between operational and overhead costs and also between paid out cost and imputed costs.

The cost structure and input use intensity of the principal crops grown in the study area reveals that major portion of cost has been incurred on human labour. The intensity of labour use is significantly high in chillies followed by
cotton and groundnut. The intensity of use of modern inputs like fertilisers and pesticides is high in commercial crops like chillies, cotton and groundnut. The intensity in the use of modern inputs in traditional crops is not significant. The share of seed cost in the total cost is found to be high in commercial crops like cotton, chillies and groundnut but low in traditional crops like jowar, sunflower, redgram and greengram.

The data clearly shows that there is a positive relation between farm size and per acre gross income in cotton, groundnut, chillies, sunflower and redgram. Thus higher gross income per acre on large farms is essentially a result of economics of scale. Higher gross income may be mainly either due to more intensive use of inputs of better price or due to holding capacity and bargain capacity. The gross returns are high in chillies followed by cotton and groundnut. It is very low in case of redgram, greengram and jowar.

The small and marginal farms are unable to provide adequate inputs and get adequate returns due to scale disadvantage and price disadvantages. Thus the relationship between farm size and gross output per cent to area that holds good for irrigated regions found to be contradictory in dryland agriculture.

The family labour income is found to be negative in the cultivation of sunflower, among marginal and small farms. It is similar in case of greengram among semi-medium farms and jowar among marginal farms. In case of redgram cultivation the family labour income is negative among all sizes of groups. The net income from cultivation of cotton and chillies is found to be increasing with farm size. Majority of the farmers incurred losses in cultivation of sunflower, redgram, greengram and jowar. Per acre loss is high in redgram followed by sunflower and greengram. Marginal farm households incurred losses in cultivation of cotton and groundnut. The overall conclusion emerged from the
analysis is that cultivation of crops in dryland regions is not economical. The income per a rupee of investment is very low in these regions. The overall picture emerges from the analysis is that output-input ratios accompanied by sharp variations across the crops reveal that dryland farmers suffer loss from low and uncertain yields. Low margins in the cultivation reflect the subsistence agriculture.

8.9 Socio-Economic status of Dryland farmers

The analysis of the socio-economic dimensions of dryland farmers reveals that socio-economic conditions of the farm households are poor in the study area. The socio-economic structure does not have any direct influence on the cultivation. From the analysis it is clearly evident that 47 per cent of the farmers belong to backward caste, 39.67 per cent of farm households belong to forward caste and 13.33 per cent are scheduled caste and scheduled tribe communities.

The data on family system clearly reveals that 60 per cent of the families are nuclear families. The average size of the family of the total farm households is 4.87. Among all farming categories the average family size of large farms is high, which is ‘7.50, while the family size is small for marginal and small farms when compared with other farmers.

Distribution of farm households by the housing status across size groups reveals that 55 per cent, 47 per cent, 32 per cent, 16.67 per cent respectively of marginal, small, semi-medium, medium and large farm households are living in katcha houses. Thus the data on housing clearly indicates the poor living conditions of farm households. The data on civic amenities reveals that 69.67 per cent of the households are depending on public tap or public hand pumps for drinking water. Only 15.33 per cent of the households have drainage facility. Nearly 70 per cent of the dryland farmers do not have LPG gas. They depend on
firewood for cooking. The data further reveals that T.V and electric fan have become important consumer goods.

The data on literacy reveals that 57 per cent of farm households are illiterates which shows that the literacy rate is low when compared to overall state rural population literacy, which is 47 per cent. The occupation structure of the farm households reveals that for 94.34 per cent of farm household, cultivation is the main occupation. Nearly 66.33 per cent of farm households have agricultural wage labour as the subsidiary occupation. Dryland farm households do not possess large number of cattle due to the fact that livestock enterprise might not be a variable option for them because they don’t get fodder throughout the year. Thus there is direct relation between value of assets and farm size. Land as a productive asset constitutes the major component of asset for dryland farmer.

The average size of the dryland farms in the study area is 5.37 acres. Semi- medium, medium and large farms have leased in lands. The data on leased-in and leased out land reveal that tenancy is not present much in the study area. The distribution of land among different social categories reveals that there is close relation between farm size and social hierarchy.

Nearly 75 per cent of farm households found to have access to bank credit. Nearly 54 per cent of the farm households depend on non institutional sources also to meet their total credit requirements. It is found that irrespective of the farm size, the proportion of farm households borrowing from non-institutional sources is same. The institutional agencies are not able to meet the credit requirements of the farmers. The farmers in the study area are borrowing loan from money lenders, commission agents and input dealers at high interest rates.

The loan borrowed per acre is found to be increasing with the decrease in farm size. So per acre credit might be increasing with decreasing in farm size. Indebtedness among farm households reveals that 80 per cent of farm households
have reported to be indebted. Average outstanding debt among marginal, small, semi-medium, medium and large farms are found to be Rs 18120/-, 35650/-, Rs 49423/-, Rs 59567/- and Rs 133817/- respectively. It leads to a situation that debt gets accumulated over the years. Thus the debt brings out situation of debt trap among farm households. This clearly reveals the stress conditions of households. It is observed that 72 per cent of farm households have used the borrowed amount on productive purpose.

The analysis clearly reveals that the income from cultivation is not sufficient to meet all the basic necessities of the families. From cultivation an average household gets a net income of Rs.419/- (an annual income of Rs. 5031). One household needs more than Rs. 20000/- per annum in order to cross poverty line. Many of the households depend on wage and non-farm business to augment their incomes. Even these incomes are not sufficient to meet basic necessities including health and education. While the monthly average farmer household expenditure is Rs. 5525/- the average monthly farmer income is only Rs.3171/- which indicates that the income received is not sufficient to meet the minimum family needs, that is, the monthly consumption expenditure is greater than the monthly realized income. This is a high probability that the households consuming less than the recommended minimum nutrition intake levels. Though the monthly per capita consumption expenditure is increasing with the size of the land possessed, family size also found to be increasing with the size of the land possessed. i.e., even large and medium farm households are consuming less than the recommended minimum intake levels in the study area.

8.10 Incidence of Poverty among selected Farm Households

The estimated composite index of standard of living reveals that the index value is lowest for marginal and small farm households whereas it is high in medium and large farms followed by semi-medium farm households. That is
marginal and small farms are found to be the most disadvantaged category in terms of standard of living. At the same time 70 per cent of semi-medium, 50 per cent of medium and large farm households are not in a better condition than the marginal and small farm households in terms of both economic and social aspects. The index of deprivation (ID) computed using the scoring technique for identified variables, reveals that 78 per cent of dryland farm households are in deprived state and only 2 per cent of farm households are in not deprived state while the remaining 20 per cent of farm households are in less deprived state. Nearly 47 per cent of the total farm households are found to be in most deprived state.

The results of the specified logit model shows that the coefficient associated with the explanatory variables have registered an expected sign and most of them are found to be significant at probability levels ranging from 1 to 10 per cent. The coefficient of determination $R^2$ is 0.85 which indicates that the model is a good fit. The result indicates that the literacy percentage, farm size, mandays of employment, percentage of adults in the household and income from agriculture are found to be negative and significant. This indicates that one unit charge in the negative and significant slope of coefficient would decrease the probability of household being deprived by their appropriative percentages. The coefficient of the other explanatory variable, family size is positive and significant, which indicates that the change in the family size would increase the probability of respondent to be poor.

The coefficient of the other variable, social status is positive and not significant. This indicates that the change in the social status of respondents would also increase the probability of households to be deprived. Hence the results reveal that the social status of the farm households could not influence their probability of being deprived, i.e., non SC, ST households are also found to be deprived by their appropriate percentages. Thus the results of analysis, imply that the probability of a household being deprived could be influenced by the variables considered in this model except that of social status.
CONCLUSIONS:

- The study area is gifted with diversified geographical, climatical, physical and infrastructural facilities.
- The net sown area is found to be stagnant for the last 50 years.
- The shares of pulses, groundnut, cotton, and chillies in gross cropped area have increased significantly.
- The shares of cereals like jowar, bajra and maize under rainfed cultivation have been more or less stagnant, while the share of rainfed groundnut in total groundnut area has decreased.
- The shares of pulses like redgram, greengram, blackgram and bengalgram have been almost stagnant.
- The growth indicators of selected crops in dryland regions found to be fluctuating widely. These fluctuations will have direct and indirect impact on socio-economic conditions of the farmers.
- Per acre investment by all cost concepts is found to be high among large farmers when compared to the other four farming categories.
- The intensity of labour use is significantly high in chillies followed by cotton and groundnut.
- The intensity of use of modern inputs like fertilisers and pesticides is found to be high in commercial crops like chillies, cotton and groundnut.
- There is a positive relation between farm size and per acre gross income in all the selected crops.
- The gross returns are high in chillies followed by cotton and groundnut. It is very low in case of sunflower, redgram, greengram and jowar.
• The family labour income is found to be negative in the cultivation of sunflower among marginal and small farms. It is in greengram among semi-medium farms and in jowar among marginal farms.
• In case of redgram cultivation the family labour income is negative among all sizes of groups.
• The net income from cultivation of cotton and chillies is found to be increasing with farm size.
• Per acre loss is found to be high in redgram followed by sunflower and greengram.
• Marginal farm households incurred losses in cultivation of cotton and groundnut.
• The income per a rupee of investment is found to be low in study area.
• Cultivation of crops in dryland regions is not economical.
• Housing status clearly indicates the low standard of living of the farm household i.e. 44 per cent without a pucca house reflect the poverty among farm households.
• 57 per cent of the heads of the farm households do not have any formal education, 11.33 per cent of the farmers have primary education, 22 per cent of the farmers have school level education and 10 per cent of the dryland farmers have had education of above 10th class. The data on literacy among the dryland farmers appeared to be low when compared to overall state rural population literacy, which is 47 per cent.
• The institutional agencies are not able to meet the credit requirements of the farmers. The farmers in the study area borrow loan from money lenders, commission agents and input dealers at high interest rates.
• The loan borrowed per acre is found to be increasing with the decreasing of farm size.
- Low return to cultivation and absence of non-farm opportunities are said to be the indication of the larger socio-economic deprivation in dryland cultivation. This will be alienated by multiple risks like, income, yield, price and credit among others. This led to the incidence of indebtedness among farm households.
- Eighty per cent of farm households are reported to be indebted.
- The prevalence of indebtedness is increasing with the farm size. The percentage of indebted farm households is high among large and medium farms.
- It is observed that 72 per cent farm households have used the amount borrowed on productive purposes and 28 per cent of farm households have used on unproductive purposes.
- The income of marginal and small farm households from cultivation is found to be much lower than the other farm households.
- The monthly per capita consumption expenditure is increasing with the size of the land possessed and family size also found to be increasing with the size of the land possessed. i.e., even large and medium farm households are consuming less than the recommended minimum intake levels in the study area.
- The socio-economic conditions of the farm households are poor in the study area. The socio-economic structure does not have any direct influence on the cultivation.
- Composite index of standard of living reveals that the marginal and small farms are found to be the most disadvantaged category in terms of standard of living.
- 70 per cent of semi-medium, 50 per cent of medium and large farm households are not in a better condition than the marginal and small farm households in both economic and social aspects.
• The index of deprivation reveals that 78 per cent of dryland farm households are in deprived state and only 2 per cent of farm households are in not deprived state and the remaining 20 per cent of farm households are in less deprived state.

• Nearly 47 per cent of the total farm households are found to be in most deprived state.

• The result indicates that the literacy percentage, farm size, mandays of employment, percentage of adults in the household and income from agriculture are found to be negative and significant. This indicates that one unit charge in the negative and significant slope of coefficient would decrease the probability of household being deprived by their appropriate percentages.

• The coefficient of the other explanatory variable, family size is positive and significant, which indicates that the change in the family size would increase the probability of respondent to be poor.

• The coefficient of the other variable, social status is positive and not significant. This indicates that the change in the social status of respondents would also increase the probability of households to be deprived.

• The results reveal that the social status of the farm households could not influence their probability of being deprived, i.e., non SC, ST households are also found to be deprived by their appropriate percentages. Thus the results of analysis, imply that the probability of a household being deprived could be influenced by the variables considered in this model except that of social status.
SUGGESTIONS

In the light of the above finding the present study tries to propose the following suggestions to improve the situation of farmers and farming in dryland agriculture.

- In view of physical resource constrains of dryland farms like small size, scarcity of finance and low credit worthiness, high risk in returns, it is suggested to encourage collective farming (either co-operative joint farming or informal group farming).

- The Shift in policy focuses on dryland farming through technology, extinction, price, and other intensives.

- There is a need to emphasise rural economic diversification to more value-added activities and non-agriculture activities.

- Provision of irrigation facilities through watershed and micro irrigation system will improve farm income and farm labour employment through improvement in the cropping intensity.

- National Rural Employment Programme in the dryland regions could be dedicated to improve the watershed areas.

- The crisis in agriculture cannot be tackled effectively within the framework of agriculture alone. Improving the quality of education in rural areas and small towns needs urgent attention. It can equip farmers with capacity to acquire knowledge of technology and obtain opportunities not only from agriculture but also from outside. Similarly, rural infrastructure including roads, warehouses, computer access etc. need vast improvement. It could facilitate diversification of the rural economy.

- Setting up of an 'Agri Risk Fund' specially for dryland crops, which could help in mitigating risks and the hardships of the farmers is suggested.

- Live stock based farming system should be encouraged.
• There is need to strengthening the policy of price support and procurement mechanism for crop grown in rainfed area.

• Government should formulate insurance policies to cover all the farmers in dryland regions. The bankers should bear the burden of payment of insurance premium instead of farmers. In case of crop failure insurance amount should be paid in the same crop season.