Chapter - VII

Summary and Conclusions
SUMMARY AND CONCLUSIONS

Chittoor district is one of the four drought-prone districts of Rayalaseema region in Andhra Pradesh. Agriculture is the predominant sector in the district. Frequent recurrence of droughts and famines had enhanced the importance of irrigation, which would achieve agricultural growth with stability. Proper emphasis may be placed on each source of irrigation. Besides no major comparative study about the impact of different sources of irrigation in the district. Hence the present study is undertaken to fill the research gaps.

Findings

1. To study the nature and scope of medium, minor and borewell irrigation across different regions of the district.

The study found that gradually the medium irrigated canal area was on decline, in case of minor irrigation tanks irrigated area also fallen but individual i.e., wells and borewells irrigated area increasing in all Mandals of the district, especially in Madanapalle and Chittoor Revenue divisions. Irrigation area is doubled in last fifty years.
2. To understand the organisation and operational features of different irrigation facilities in the sample area.

In the study area existing usage of canal water is found an inefficient, wasteful and inequitable. Tail-enders are being deprived of their rightful share of water. Still a major portion of the canal system is unlined. The minor irrigation tank beds are silted and have reduced their storage capacity and also occupied the tank beds for cultivated area. In case borewell irrigation an irregular and uncertain electricity supply makes borewell irrigation a very risky financial venture. The study also observed that drop of voltage on the borewells and consequent loss of efficiency of the equipment and finally yield rate. An increasing number of borewells with electric motors are observed, when the ground water table is on decline, as a result of pumping in some parts of study area.

The study reveals that tank irrigation (minor irrigation) is the cheapest source of irrigation. The cost of irrigation in the case of borewells is higher. The electricity fitted borewells are the most expensive source of irrigation. The overall view is that the cultivators would like minor irrigation tanks to be developed most in their villages.
To find out input-output ratio across the sample area.

The material and non-material inputs utilization trend reveals that the proportion of material inputs in paddy of all category farmers, is 17\textsuperscript{th} per cent the highest under tank irrigation than canal 16 per cent and borewell irrigation 16 per cent. The use of non-material is 84 per cent the highest under borewell and 82 per cent under tank irrigation. Sugarcane the total value of material inputs is the highest 21 per cent under tank irrigation than borewell 19 per cent and canal 21 per cent irrigation. In case of non-material inputs is the highest under borewell 81 per cent canal 79 per cent and tank 78 per cent irrigation is the least. It is interesting to note that the rental value and interest on fixed capital is higher in borewell irrigation than canal and tank irrigation. The total value of inputs utilization trend reveals that for all the main crops like paddy and sugarcane is naturally higher under borewell irrigation than canal and tank irrigated lands. Paddy crop it is 37 per cent under borewell, 33 per cent canal and 30 per cent under tank irrigation. In case of sugarcane it is 33 per cent under canal, 32 per cent tank and 35 per cent under borewell irrigation. The input-output ratio in tank 1:1.08 is higher than canal 1:1.06 and borewell 1:1.04 irrigated area. The analysis of variance reveals that the material used under tanks irrigation is significant compared to other sources of irrigation. In case of non-material used under borewell is significant than compared to irrigated under canal and tanks. Different cost levels also significant under sources of irrigation. The cost-C of paddy under borewells is significant than other sources.
4. To examine crop pattern change across variation of sources of irrigation.

Different sources of irrigation has a favourable crop pattern effect. The study reveals that paddy is the largest crop cultivated under medium (canal) source of irrigation and minor irrigation (tanks). The second largest crop is sugarcane as same trend, and vegetable crops under borewell source of irrigation. The proportion of land under commercial crop is nearly 62 per cent under borewell irrigation. These figures further reveals that the borewell irrigation source is very expensive. The analysis of variance to find out there is highly significant difference between cropping pattern and source of irrigation. The results between crops and category wise which is not significant.

Yield of Crops

We find that paddy which is the largest crop gives the highest yield of 2001 kgs per acre under borewell irrigation, as compared to 1732 kgs and 1850 kgs per acre under tank and canal source of irrigation. In case of the yield of sugarcane, there is a significantly higher as 41 tonnes under the canal irrigated area than the tank irrigation 34 tonnes. Among different farmer categories the yields of paddy crop is higher in large farmers under the three sources of irrigation. In case of sugarcane similar trend is observed. The analysis of variance results indicate that there is highly significant between the yields of paddy and sugarcane under canal, tank and borewell irrigation and also observed that the yield of crops which are irrigated under borewells are significant than irrigated under canal and tank.
To estimate the impact of different irrigation sources on the farm income and employment among farm households in the sample area

Income and Employment

The average net profitability per acre in the tank irrigated area is significantly higher at Rs.730, while it is only Rs.440 and Rs.589 per acre in the borewell and canal irrigation. The average net profitability under canal irrigated area is higher at Rs.8041 while it is only Rs.2461 in the tank irrigated area and Rs.6457 under borewell irrigation.

The average farm business income and farm investment income of paddy per acre are also higher under borewell irrigation than canal and tank irrigation. In case of sugarcane these incomes are higher in the canal than tank and borewell irrigation. It is revealed by the data that the farm net income of paddy is higher under both canal and tank irrigation and least under borewell irrigation.

The utilisation of human labour input is considerably higher in major crops like paddy and sugarcane under canal irrigation than lower in tank and borewell irrigation. Taking irrigation sources, we found that canals show the maximum productivity of human labour than tanks the least. Assured irrigation facilitated the growth of major irrigated crops which require intensive labour use and has a favourable employment effect.
Iron ploughs and tractors are used only by a small number of cultivators. Tractors seems to have been used by the large farmer in canal irrigation. It also used to a greater extent under canal source of irrigation than minor irrigation tanks and borewell source of irrigation. The number of households using dung manure is larger under tank and borewell irrigated area than canal irrigated area. Where as chemical fertilizer is larger in canal irrigated area than tank irrigated area. Improved varieties of seeds are more under canal and borewell irrigated area than tank irrigation. The burden of outstanding dues is more widespread among cultivators using borewell irrigation than among those using canal and tanks irrigation.

To give a specific focuses to the hypotheses the study have tested and the results as follows.

1. The impact of different sources of irrigation seems to have been positive correlation.

   The yields of paddy and sugarcane crops are significant under canal, tank and borewell irrigation. Thus the hypotheses that assured source of irrigation encourage the yield of crop. There is positive relation in between tank and borewell irrigation.

2. No positive relation in between tank irrigation and borewell irrigation. The study observed that there is a positive relation.
3. To operate personal borewell easier than minor, medium irrigation facilities.

It is found that the operation and cost of medium and minor irrigation is lower than borewell irrigation. So it is negative.

4. Tank irrigation has sustainable development than that of borewell irrigation

The study reveals that an increasing number of borewell pumpsets with electric motors ground water table has decline, it effects the efficiency of the borewell irrigation. Minor irrigation tanks are not only help conserving scarce water but also safe guarding water table. Thus the hypotheses found that tank irrigation has sustainable development than borewell irrigation. It is positive.

5. Canal, tank irrigation has generated more employment potential than that of borewell.

Canal and tank irrigation has generating more employment potential than borewells. It is tested as regard to labour utilisation the percentage of total human labour is the highest under canal irrigation than tank and borewells. Thus, hypotheses is found that assured source of canal irrigation encourages human labour absorption, which has been found correct. It is positive.

6. The farmer income of households under canal and tank irrigation cultivation is lesser than that of borewell irrigation.
Taking farm net income from paddy under tank irrigation is maximum than canal and borewell. Sugarcane under canal gets maximum income than tank and borewells. Thus the hypotheses is observed that farm income under canal and tank irrigation cultivation is lesser than that of borewells. It is negative.

Recommendations and Suggestions

In the context of the findings stated above some viable recommendations for improving irrigation facilities and agriculture have been made as under.

1. Main branch canals upto the distributories are to be lined either in cement or plastic, so that it can avoid leakages.

2. Need for desilting of tanks regularly and should be handed over to the water users association for further maintenance and operation.

3. Ground water potentiality has to be increased by different measures like contour bunding, check dams, watersheds, percolation tanks and afforestation.

4. Store the run off flood water with proper repairs timely and maintenance of medium and minor irrigation projects. Catchment areas are to be treated scientifically.

5. The cropping pattern in irrigated area has to be altered and go for irrigated dry crops like mango, vegetables oil seeds etc., should be grown to get more yields and income.

6. There is a plenty of scope for growing milk, buffaloes, cattle and to generate dairy products and sericulture.
7. Handri Niva and Galeru Nagari major irrigation projects are good-old dreams of this district are to be completed earlier.

8. Farmers are to be trained vigorously through Krushi Vignan Kendras (KVKs), Non-governmental organisations (NGOs) in every three years to upgrade skills.

9. To bring eco-friendly among farmers farming systems, there should be an awareness programme on wild life, birds sanctuary promotion.

10. Wind energy, solar power, bio-gas are to be popularised among villagers by state and NGOs.

11. Marketing facilities at Mandal headquarters for all produces are to be arranged, keeping middlemen at distance.

12. Micro-irrigation is to be encouraged at every village level, so that precious water is to be saved.

13. Agro-based and cottage industries are encouraged to create employment in villages.

Future Research

1. Over-exploitation of ground water is taking place in dryland areas, where it is to be studied.

2. Revival of community irrigation systems are in need and how it will be enforced in backward area.

3. Rejuvenation of rivers and tank irrigation in rainfed areas needed to re-examine its consequences.

4. If corporate farming encourages, the emergence of development both in income and employment is to be studied.