CHAPTER 7

SUMMARY AND CONCLUSION

7.1 SUMMARY

An attempt has been made to study the multidimensional impact of socio economic and environment well being of the community involved due to restoration work of partial desilting and tank bund strengthening of tank irrigation system under different participatory approaches. Two tanks from Avalur in Kancheepuram block and Puliambakkam in Walajabad block of Kancheepuram district and one tank from Ponpadi in Thiruvallur district in Tamil Nadu have been chosen for studying the impact of tank restoration both during before and after restoration periods. In all three tanks, stakeholders were involved in implementing the restoration programmes in close association with two different organisations such as PWD and NREGA under the following approaches as discussed in section 1.2.3

i) Need based demand sensitization (localization) of restoration program (NREGA Scheme);

ii) Localization based on balancing restoration scheme with utilization (NREGA Scheme); and

iii) Different alternatives to rehabilitate the tank irrigation system with short term and long term perspectives (PWD Scheme)
In one case study at Ponpadi, restoration work was taken up under the PWD scheme with short and long term perspectives. In the other two cases at Avalur and Puliambakkam, the restoration work was carried out on need based demand sensitization (localization) (woman participation) and localization based on balancing restoration scheme with utilization (leadership participation). Restoration works like desilting of tanks, desilting of channels and tank bund strengthening have been done on these three tanks during the period of 2008.

Since in all three villages, the populations of landholders were only one third of the total population of landless people, landless people are majority in these villages. Also, one of the objectives is to investigate the socioeconomic status of the people before and after the implementation of tank restoration schemes. Therefore, in order to capture the complete information with respect to the economics, all the landholders were included in the sample. However, 20% random samples were selected from among the landless people. In all, the sample size was 423 (268+155) out of the population of 1084 (268+816), which is nearly 39%. This can be regarded as advantageous since it is on the higher side of the required 20% of stratified random sampling.

Keeping in view the importance and significance of the study, both qualitative and quantitative methods were employed for data collection. Data were collected through group discussion with different categories of farmers. However, the study mainly relies on the data collected by using an interview schedule. Key informant interviews and focus group discussions conducted with multiple stake holders to find out strength and constraints of the restoration schemes under NREGA and others. Beside this, secondary data were collected for supportive and supplemental information. The data obtained through quantitative methods were classified and analysed using SPSS, a Statistical Package
for Social Science. The impact analysis of restored tanks was carried out for various aspects and significant findings are listed below:

(i) Evaluation of restoration of tank system based on the lessons derived from implementation leads to a wealth of knowledge. This helps in developing guidelines for tank restoration schemes.

(ii) A general conceptual framework developed (Chapter 3) can be applied for evaluation of impact analysis of tank irrigation system projects (completed/ongoing) implemented under different schemes.

(iii) In Avalur before restoration, there was no water in the wells during the dry season. After restoration there was 4.3 m average depth of water level in the wells during this period. There were similar trends in Puliambakkam and Ponpadi villages also. Depth of water levels after restoration was more than 40% higher than before restoration. Duration of pumping hours also increased after restoration by 2 to 2.5 times.

(iv) Cropping intensity by combined tank and well irrigation had increased due to restoration schemes from 46% to 61%, 53% to 74% and 54% to 67 % in Avalur, Puliambakkam and Ponpadi villages respectively. Cropping intensity by tank irrigation is increased from 23% to 37%, 18% to 23% and 11% to 19% respectively.

(v) Impact of tank rehabilitation on tank bund tree plantation was more than twice the orders of magnitude. In Avalur and Puliambakkam villages, juliflora tree was planted along the tank bund for a length of about 300 m and 250 m respectively.

(vi) Restoration of tanks have provided opportunities to expand area under irrigation due to increased water availability during irrigation. In all three villages, before restoration most of the lands were cultivated in one season only. Only, a hand of lands was cultivated in
both the seasons since there was no water in the tank. After restoration there was water in the tank so the farmers used the tank during both seasons. The groundwater recharge zone also helped to maintain water level in the command area wells for cultivating crops in both the seasons.

(vii) Improvement in the command area wells lead to increase in agricultural area in the villages where restoration schemes were effective. There was an overall increase irrigation intensity of about 70%, 55% and 56% in I season and 44%, 66% and 30% in II season in Avalur, Puliambakkam and Ponpadi, respectively.

(viii) The average gross income, input cost and net income after restoration in general were higher than before restoration in the villages. Comparative analysis was carried out with paired t-test and the results shows that gross income, input cost and net income highly correlated with tank restoration in the villages.

(ix) Financial feasibility indicators in terms of Benefit Cost Ratio (B/C), Net Present Value (NPV), Internal Rate of Return (IRR) and Payback period for restoration schemes of tank irrigation system in all the villages are within the accepted limits. The Benefit Cost Ratios of the restoration projects in Avalur, Puliambakkam and Ponpadi were 4.01, 6.22 and 5.94. B/C Ratios of all three restoration project were more than one and hence the three projects are viable.

(x) Economic growth factor of irrigated area, farm income and crop yield for restoration schemes of tank irrigation system has increased considerably in all the three villages.

(xi) Restoration under NREGA scheme offers job for both woman and old people compared to men. During the implementation of restoration work like channel desilting, jungle clearance work and tank desilting
in Avalur village, at least 100 people were employed consisting of 16% men, 70% women, and 14% old people employed at an average daily wage of Rs 80/person/day during that period. In Puliambakkam village at least 230 people were employed on restoration under NREGA scheme with 37% men, 47% women, and 16% old people at an average daily wage of Rs 80/person/day.

(xii) Overall increase in fodder availability has had a major impact on both landholders and landless labourers in the villages. Very significant indirect impact through increased fodder availability particularly green fodder berseem and fodder sorghum had greatly improved the nutritional quality of buffalo and cow diets. With the improved diet, milk production has increased between 37% in Ponpadi and 47% in Puliambakkam. The increase in milk production has been supported by increased availability of fodder, reduced time to collect fodder and availability of drinking water for livestock.

(xiii) Before implementation of restoration, farmers used rainfed production both for home consumption and to cover other household expenses (school, cloth, health care) together with income from livestock. The farmers expressed that the income from crop sale and livestock was not sufficient for home consumption to cover these household expenses. As a result they faced shortages in food, seeds for the next season and cash to buy inputs. Implementation of the restoration schemes helped them to increase crop output and income from farming. All the three tank restoration schemes offer some form of food security to the farmers and the surrounding communities.

(xiv) Considerable increase has been noticed in the profitable indicators of cost and return. Even though productivity of crop yield and profitability of farm income is increased significantly after restoration the cost benefit ratio is slightly lower when compared to the earlier
ones, because the input cost of labour wages, fertilizer, machinery etc., have drastically increased in the recent past.

(xv) The incremental benefits of production and productivity of crop yield, irrigated area and net income due to the restoration of tanks in the villages of Avalur, Puliambakkam and Ponpadi have increased considerably benefiting the community during both the seasons.

7.2 FINDINGS AND CONCLUSIONS

The major conclusions arrived at from the study with respect to different participatory approaches are,

(i) Tank irrigation system development through restoration has become the main intervention for agricultural land management and rural economic development.

(ii) Today the rehabilitation work could not be carried out because the investment amount is more hence the tanks have to be protected through cost effective process of restoration works like partial desilting of tank, channel desilting, bund strengthening etc. These restoration works have to be done in periodically and regularily every year or at least once in two years for protecting environment well being and developing economic improvement in rural areas.

(iii) After restoration, all the three tanks have been used as storage structure to recharge wells in the command area. This improvement of groundwater availability leads to increased cropping in both the seasons.

(iv) In all the three villages increased irrigated cropping area and cropping intensity and fodder availability have protected environmental well being by conserving the basic natural resources of water bodies and agriculture land due to restoration of tanks.
(v) Due to restoration of tanks, in all the three villages showed improvement in socio economic indicators such as irrigated cropping area, crop productivity, farm income, livestock economy and employment opportunity.

(vi) Restoration work under NREGA scheme has made a significant contribution on employment and income generation in the villages of Avalur and Puliambakam.

(vii) All the three restoration schemes offer some form of food security for the farmers and the surrounding communities.

(viii) Strengths and Opportunities seem to outweigh the Threats and Weaknesses for restoration work under NREGA thereby offering tremendous scope for success in unskilled manual work like partial desilting of tanks, supply channels, strengthening bunds, etc., The PWD organisation offer scope towards success in skilled work of machinery used to desilting works for protecting and conserving large water bodies.

(ix) Participatory approach for implementing any restoration scheme of rural tank irrigation system is a viable strategy of rural development for achieving sustainable rural livelihoods in Tamil Nadu.

(x) Three case studies of restoration schemes of tank irrigation systems in Tamil Nadu provide evidence that irrigation through restoration scheme can bring a sustainable agriculture and economic development without severe effect on the environment.

(xi) Stakeholder involvement is necessary for implementing any restoration scheme of tank irrigation system in order to increase the productivity of crop through increasing groundwater recharge, contribute to food security and rural livelihood improvement by
improving profitability of income and getting employment opportunities.

(xii) Complete rehabilitation may not be possible due to cost consideration as well as the irrigation structures are ancient and old. In such cases partial restoration such as partial desilting of tank bed and supply channels option may be possible which may yield the expected benefit and also cost effective process for rural livelihood improvement.

(xiii) Financial feasibility analysis for stakeholder involved in implementing the restoration scheme indicated favorable results in terms of NPW, B:C ratio, PI and IRR. In other words, investment in partial desilting like channel desilting and desilting of specified location in the Irrigation tank (only recharging purpose) was found economically feasible.

(xiv) This document is an output from a restoration of tank irrigation system project under different participatory approaches taken under the NREGA and Government organisation. It aims to provide information for decision-makers and policy-shapers to improve their awareness of the important role of tank irrigation system for irrigated agriculture to sustain rural livelihoods.

(xv) The overall conclusion is that irrigation development through tank restoration schemes has sustained and improved rural livelihoods for large numbers of beneficiaries.

7.3 SCOPE OF FUTURE STUDY

This study has particularly focused on assessing the impact of tank restoration scheme with stakeholder participation on socio economic and environmental well being characteristics. However there is a additional need to assessing the impact of tank restoration on
technological characteristics. Another area that needs further research is the choice of using traditional knowledge for water conservation techniques and their impact on food security in rural areas. Hence more detailed research is required regarding the types of irrigation technology combined with traditional knowledge that are appropriate to different types of agro-ecologies and regions in the country. Also some other areas of research such as tank hydrology, tank and well water interaction, multiple uses of tank etc are also needed. In recent years, rural development program combined with conservation program of irrigation tanks the TamilNadu government has been promoting low-cost. In this regard, there is a need for detailed study to examine its impact particularly in promoting Tank irrigation system management.