SOCIAL AND ENVIRONMENT ASSESSMENT
An Update for Additional Financing of KCBTMP

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Submitted to
JSYS, Bangalore

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<td>Cultural Property Action Plan</td>
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<td>DMI</td>
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<td>District Project Unit</td>
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<td>Environment Management Plan</td>
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<td>GIS</td>
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<td>JSYS</td>
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<td>KCBTMP</td>
<td>Karnataka Community Based Tank Management Project</td>
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<td>KVKs</td>
<td>Krishi Vigyan Kendra</td>
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<td>M&amp;L</td>
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<td>MOA</td>
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<td>UAS</td>
<td>University of Agriculture Sciences</td>
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<td>WIG</td>
<td>Women Interest Group</td>
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<td>WUE</td>
<td>Water Use Efficiency</td>
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<td>ZP</td>
<td>Zilla Panchayat</td>
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1. EXECUTIVE SUMMARY

The Government of Karnataka has been implementing the Karnataka Community Based Tank Management Project (KCBTMP) since 2002 with financial support from the World Bank. For this project, a detailed social and environmental assessment was carried out by the Institute for Social and Economic Change (ISEC), Bangalore. Now, the Karnataka government has requested for additional finance from the Bank to extend KCBTMP in the hitherto uncovered areas within the state. This report, prepared by ISEC is an update of social and environmental assessment (carried out for the ongoing project) for additional financing of KCBTMP.

The objective of KCBTMP is to improve rural livelihoods and reduce poverty by developing and strengthening community based approaches in managing irrigation tanks. Jala Samvardhane Yojana Sangha (JSYS) has been established as the nodal agency to implement the project on rehabilitation of irrigation tanks (coming under both PRIs and Minor Irrigation Department) in the state with the help of Cluster Facilitation Teams (CFTs), Tank Management Institutions (TMIs), etc.

The total target of tanks (under ongoing project) to be rehabilitated through the involvement of the community in an integrated manner was 2,000 spread over 34 taluks encompassing six agro-climatic zones. The figures on the status of implementation show that 540 tanks have completed all the phases of project cycle and are in the process of transfer to TMIs. Of the 1,140 tanks under implementation phase, more than 40 per cent tanks are expected to complete implementation phase before the monsoon season of the current year. The remaining tanks are in either the pre-planning or planning phases.

During the design of KCBTMP, it was expected that the project would have positive social and environmental impacts. Specifically, the rehabilitation of tanks was expected to result in the augmented supply of irrigation water, ground water recharge, better quality of drinking water, increased agricultural production and productivity, increased employment and wellbeing of stakeholders and better management of natural resources. This study shows that these have been by and large achieved under the current project.

It is, therefore, important to extend the project benefits to the areas hitherto uncovered not only for poverty alleviation but also for protecting the environment. The consultations held at different levels reveal that all the stakeholders (the community, CFTs, and the project staff at the state and district level) are satisfied with the design of KCBTMP, as it addresses the issues relating to the tank rehabilitation such as catchment area treatment, foreshore plantation, tank bed desiltation, bund strengthening, command area development, and incorporating tribal, gender and environmental concerns. Hence, the scenario of a new project with different components is ruled out. The widespread opinion was that fine-tuning of some of the components, additional criteria in the implementation of few of the components and marginal changes in the implementation strategies will help in improving the effectiveness of the project. Thus, the existing project with a few modifications has been suggested for implementation in the hitherto uncovered areas under the proposed additional finance.

The proposed project cost is estimated at about US$ 100 million with the same cost-sharing ratio as the existing project between the World Bank, government of Karnataka (GoK) and the community. It is proposed to cover about 1,200 tanks (in the range of 20-100 hectares
command area) in the selected 39 taluks spread over 8 districts. The extended period is planned up to 2012 and the implementation is proposed to commence from the last quarter of 2007 to ensure the availability of at least 4 working years to complete the tank level project cycle. It is estimated that about 51,000 hectares of command area will be covered.

This update of social and environmental assessment is based on consultations with stakeholders at different levels and review of project documents. The update identifies key social and environmental issues and makes suggestions towards modifications in the social and environmental framework adopted in the current project.

**Issues and Suggested Modifications**

The screening framework involving social, environmental and hydrological parameters was the basis for selection and prioritisation of tanks. The current review reveals that greater weightage has been given to hydrological parameters in tank selection. Therefore, there is a need for improvement in the screening framework giving due weightage to social and environmental aspects.

The present study found that sense of ownership, participation of people in all the aspects of tank rehabilitation and their organization are critical for sustainable management of tank system. At the same time there is a need for a successful and continued adoption of improvements relating to new and suitable crops, water management, pest management, etc. To achieve this objective, the ongoing project initially adopted a 24 months project cycle which was later on reduced to a 20-month project cycle consisting of four months of pre planning phase, four months of planning phase, eight months of implementation phase and four months of post implementation phase. This has worked well in smaller and single village tanks with homogenous communities. However, for large size tanks, longer duration and flexibility in project cycle is needed to address the seasonal factors involved in the implementation. This will help in tackling issues related to inter village tanks and bring more cohesion among various communities. The project has been designed to adopt a process-oriented mode with considerable focus on the quality of processes rather than on the targets. The experience indicates that the sudden shift in emphasis on attaining targets by reducing the project period has affected the quality of processes and social mobilization. It is therefore suggested that for meticulous planning of the physical and financial targets, all the aspects including time and human resources available are considered. It is also suggested to link the quality milestones relating to community mobilisation with release of funds. There is also a need to give more space to the social and environmental staff in the ITDP appraisal and the release of funds.

**Tank Management Institutions (TMIs)**

The project has provided four options for TMIs viz., village association, sub committee of gram panchayat, gram sabha and gram panchayat; for the community to choose from at the tank level. The review revealed that the two models viz., village association (tank users) as independent societies and subcommittee of Gram Panchayat (GPSC) under the Panchayat Raj Act are the preferred models. Of these two, the option of GPSC was adopted in only 5 per cent of tanks. In the context of village association, the most preferred option, there is a need to improve the linkages with the Panchayati Raj institutions to ensure dove tailing of mainstream programs and services in the post project scenario. In this regard, it is suggested that (i) institutional mechanisms at the district and taluk levels (under the chair of chief executive officer (CEO) or EO) should be established for the convergence of resources; (ii) ensure participation of relevant departments such as agriculture, horticulture, forestry,
livestock and fisheries during the planning and implementation of different project components; (iii) ITDP approval in the gram sabha should be made mandatory to ensure close collaboration between gram panchayats and TMI s during the planning phase; and (iv) ensuring convergence between the government employment programmes and project activities and bring appropriate changes to ensure convergence.

**Participation of Stakeholders**
The planning and implementation of Integrated Tank Development Plan (ITDP) have been largely participatory and transparent. While the participation of command farmers and women in the project activities has been fairly good, that of other subcommittees/supervisory committees formed within the TMI s has been uneven. This needs to be improved to ensure participation and involvement of all stakeholders within the TMI.

**Tribal and Vulnerable Groups**
As per the design of the project there is fair representation of Scheduled Castes, Scheduled Tribes and vulnerable families in the TMI s. Such representation is very well institutionalised with the help of bylaws and guidelines prepared during the course of the project implementation. The community in general has accepted/recognized such vulnerable sections as stakeholders in the tank system. However, more focus on accommodating the needs of these sections in the planning and execution of the main components to sustain their continued participation and quality of their livelihoods is needed.

**Gender Aspects**
The participation of women in the TMI s is fairly institutionalised with almost equal representation of both the genders in the TMI s general bodies. There are some instances where the community has opted for all women management committees. The quality of TMI performance was fairly good in such cases in terms participation, transparency, conflict management etc. This calls for the improved women’s participation, empowerment of women interest groups (WIG), involvement of women self help groups (SHGs) in the work execution and in decision making process relating to water management, crop planning and operations and maintenance.

**Resettlement and Rehabilitation (R&R)**
The project has a well designed R&R policy to restore the livelihoods of project affected families. Though the encroachment issues were identified in about 50 per cent of the tanks, only about 9 per cent tanks have qualified for rehabilitation as per the R&R eligibility criteria. Only in such cases were the resettlement action plans planned and implemented. The recent impact study commissioned by JSYS has revealed satisfactory implementation process. The study established the suitability of the policy for the future projects as well. The focus in the follow-on project should be, however, on capacity building and awareness generation on a continuing basis.

**Environmental Aspects**
The catchment area treatment plan includes treatment of feeder channels up to 500 meters by constructing suitable silt arresting structures and clearing obstacles to ensure smooth water flow. This was envisaged on the assumption that the other aspects of catchment treatment would be taken care through efforts aimed at convergence with the World Bank supported watershed project. However, the review revealed a limited convergence due to incompatible

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1 This was in the original design. However, this was extended to 1000 meters from the sixth batch of tanks. Since we did not cover the sixth batch of tanks, we base our discussion on the 500 meter norm.
locations, project cycle timings and different approaches used by both the projects. There is need for interventions in the higher reaches of feeder channels/drainage to plug deviations, increasing vegetative cover and also empowering the catchment area farmers on better land management and crop production practices with focus on the capacity building.

The rehabilitation works focused on improving the operational performance of the tanks such as desiltation, repairs and restoration of tank structures and on-farm development works. These have shown visible impacts in terms of plugging the water leakages, increase in storage, better conveyance in the command areas, incremental irrigation benefits for agriculture, etc. The perceptions of community, however, indicate that there is need for increasing focus on creating storage and improving the conveyance system to ensure irrigation for the tail end farmers. There is also need for flexibility, simplification of procedures and systems for planning and implementation of civil works component to enable TMIs to own the interventions planned and complete the execution within the planned period. There is abundant indigenous knowledge and skills in civil works in the village which needs to be given more importance to make this component meaningful and effective.

The project has adopted an environment management framework which has been mainstreamed into all the project components. The review shows that ITDPs have clear plans on safe disposal of silt, feeder channel treatment in the catchment areas, afforestation and biomass development in the tank areas, integrated pest management (IPM) and integrated nutrition management (INM) as part of agricultural plans. Though implementation has been largely effective, certain issues such as mobilization of the required number and type of species, greater synergy between the plan implementation and the seasonal factors need to be addressed. There is also a need for awareness generation among catchment area farmers to ensure inflows into the tank.

The agriculture and horticulture demonstrations have succeeded in the establishment of viable methods to improve water use efficiency (WUE) and agricultural production. The Jalashree method (reducing water consumption) of paddy cultivation and the crop specific IPM and INM practices as demonstrated by the project have been well accepted by the farmers. There is a need for improving the approach and institutional mechanism to ensure wider diffusion of the demonstration technologies to large number of farmers within the village/s.

**Sustainability of TMIs**
The project has transferred 75 tanks to TMIs for management and another 450 tanks are in the process of transfer. The initial results indicate that TMIs have exhibited responsibility in performing day-to-day operations and maintenance. However, there is need for institutional capacity building of TMIs for the post project sustainability, developing an apex body of TMIs and a minimum handholding support.

**Institutional Aspects**
The project has three level (state, district and cluster of tanks) organizational structure for effective facilitation in planning and implementation of project activities at the TMI level. At all levels, multidisciplinary specialists have been positioned. Though this institutional arrangement has been found to be adequate, the periodic assessment of human resources is essential to improve and maintain the quality in the planning and implementation of the project. The frequent turnover of personnel at all levels is an area of concern and requires improvements in human resource policies including selection and recruitment procedures.
Training and Capacity Building
The project has a well designed capacity building strategy including plans and training modules. However, from the middle of the project period, frequent turnover of the staff at all levels has affected the overall implementation of capacity building plans. With more number of persons joining the project from the line departments, there is a need for frequent vision building exercises and training to equip them to handle the implementation in consistence with project approaches. There is also a need to focus on the experiential learning with frequent exposures and intra TMI interactions.

Monitoring and Learning (M&L)
The Monitoring and Learning (M&L) system of the project is suitable for monitoring the process in the planning and implementation of multidisciplinary components, impact assessment and capture the lessons from the same. However, there is need to strengthen the institutional performance and process monitoring aspects to keep continuous track of the processes and also physical and financial achievements. There is also a need to improve the institutional capacity with adequate specialized manpower at the state and district levels to handle implementation issues in more intensive and effective manner.
2. INTRODUCTION

The Government of Karnataka has been implementing the Karnataka Community Based Tank Management Project (KCBTMP) since 2002 with financial support from the World Bank. A detailed social and environmental assessment was carried out by the Institute for Social and Economic Change (ISEC), Bangalore, before this project was designed and implemented. Now, the Karnataka government has requested the Bank to provide additional finance to extend KCBTMP in the hitherto uncovered areas within the state. This report, prepared by ISEC, is an update of social and environmental assessment for additional financing of KCBTMP.

The key objective of the KCBTMP is to improve rural livelihoods and reduce poverty by developing and strengthening community-based approaches to managing selected tank systems. The Karnataka Government established the Jala Samvardhane Yojana Sangha (JSYS) as the nodal agency in the state under the Department of Water Resources (Minor Irrigation) to rejuvenate and restore tanks (under both PRIs and Minor Irrigation Department) in the state through community based management. JSYS is currently implementing the KCBTMP in 34 taluks of 9 districts in the state with credit support from the World Bank. The project, which has been planned to cover 2000 tanks with an estimated command area of 72,000 ha, supports a broad and holistic approach to tank development and management aimed at restoring community involvement and participation in land and water management.

The five-year experience of project implementation shows that the project has had a significant impact in ensuring community responsibility for the development and effective operations and management of tanks. The project has thus demonstrated the viability of community-based approach. The GoK has now proposed to extend the project to about 9 districts in the State and intends to request for additional financing for expanding the geographical coverage of KCBTMP. The GoK proposes to improve 1,200 tanks with an approximate command area of about 80,000 hectares spread over 39 taluks in 9 districts.

Accordingly, JSYS has approached the World Bank to support the Karnataka Government to extend KCBTMP to the hitherto uncovered districts in the state. The proposal from the state government is under active consideration of the World Bank. Before the follow-on project is considered and implemented, there is a need to undertake a social and environmental assessment study to update the existing framework. This social and environmental update has been taken up for JSYS to assist the organisation in its request for additional financing for implementation of KCBTMP in the hitherto uncovered areas of the state.

2.1 Objectives

The objectives of this study are to:

1) Assess the approach, framework and implementation strategies to address social and environmental issues as followed hitherto by the JSYS in KCBTMP;

2) Examine whether the approach, framework and implementation strategies will be adequate and effective for the future projects; and,

3) Suggest changes and/or modifications / improvements in the approach, framework and implementation strategies of the project.
2.2 Detailed Tasks To Be Carried Out
The broader framework of the study consists of examining the current approach, framework and implementation strategies followed in the ongoing project for addressing / mainstreaming social and environmental safeguard issues in the proposed project. Based on the examination and assessment of experiences of implementation, the study should update (a) Consultation and participation strategy, (b) Social & environmental screening framework, (c) Baseline information and Monitoring and Learning (M&L) strategy for assessing social and environmental impacts, (d) Resettlement Action Plan (RAP) (e) Tribal Development Plan (TDP) (f) Environment Management Plan (EMP), (g) Pest Management Plan, (h) Gender Action Plan (GAP), (i) Tank safety plan, (j) Protection of cultural heritage, etc. The assessment has been carried out in consistency with the GoI, GoK and World Bank safeguard requirements, policies, regulations and guidelines.

The specific tasks to be carried out under this project are as follows:

a) **Assessment of methodology to identify tanks to be covered under the project:** Examine the criteria adopted in screening the tanks for selection, assess the extent to which the criteria helped the ongoing project to select appropriate and needy tanks and suggest changes/modifications, if any.

b) **Establishment of baselines and monitoring & learning strategy:** Examine the baseline information established for key environmental and social parameters including socio-economic conditions, climate, topography, hydrology, critical habitats etc., as part of the Monitoring & Learning system of the project and make suggestions if any to update the same. Also assess the experience gained as a part of monitoring and learning component in the existing project, and suggest modifications, if any.

c) **Assessment of positive and negative social and environmental impacts of the project activities and measures to enhance the positive environmental impacts and to update the framework for identification of mitigation response to and monitoring of the adverse impacts as part of the project:** The ongoing project has adopted a framework with reference to the above and the study will look into the implementation experience to suggest improvements and modifications, if necessary.

d) **Assessment of framework and approach for identifying and involving vulnerable groups and women in the project.** The study will also look at special provisions to ensure their proactive participation in the decision making process in the community management of tank systems as well as opportunities for off-farm employment and other income-generating activities. In the ongoing project, a focused strategy has been adopted for the vulnerable and women. The study will examine the experience gained during the project to suggest an update in the implementation strategy, if necessary, for addressing issues concerning these vulnerable sections.

e) **Assessment of impacts on tribal/indigenous population:** The ongoing project has also been covering Scheduled Tribe (ST) areas and therefore it is important that these issues are addressed up-front mainly to enhance their participation in the project and to ensure that the project benefits reach them. The study will derive lessons from the implementation of Tribal Development Plans from the ongoing project to come out with specific suggestions, if any, and update the existing implementation strategies and approaches.
Assessment of Catchment Management Plan (CMP): To ensure sustainability of project investments such as desilting, it is imperative that satisfactory tank catchment area protection be fully integrated into the project activities. This would involve undertaking of many activities and addressing issues relating to watershed management, soil erosion, vegetation, water quality, sedimentation, ground water recharge, etc. The ongoing project has Catchment Management Plan (CMP), which is part of the Integrated Tank Development Plans (ITDPs). The study will assess the experience of implementation of CMPs and update, if necessary, the CMP implementation strategies. This will also include experiences and constraints in integrating / converging the similar projects of the other departments.

Examine tank safety: During tank rehabilitation and modernisation, many of the tanks need to be examined from the point of view of the structural safety of the embankments to withstand the designed flood. The ongoing project has a tank safety plan in place. The study will examine the experiences to update / modify the tank safety plan, if there is a need. The proposed follow-on project is expected to give preference to MI tanks with larger command areas and bund height. Hence, the study will examine the dam safety issues in depth to update the existing plans and strategies. This implies updating the framework for a basic level hazard assessment, tank strengthening measures, community awareness and mitigation and response measures to minimise any social, environmental and economic impacts of downstream areas and tanks in the system.

Analyse induced environmental impacts: The existing project has adopted Integrated Pest Management Plan and other measures to address induced impacts on natural habitats. The study will assess the experience gained during the implementation of the ongoing project and update these strategies and plans, if necessary.

The study will also examine awareness building and communication strategies adopted in the existing project and suitably update if required.

The study will also examine the experiences in addressing any negative impacts on cultural properties in the tank areas and shall improve the existing approach and strategy based on the implementation experiences of the Project.

2.3 Conclusion
Having outlined the main purpose, objectives and detailed tasks of the study, let us now provide a brief description of the original project. Since this description is based on the document on Project Implementation Plan (PIP) and Project Appraisal Document and this document is available in printed and electronic version to all the concerned stakeholders, it is briefly presented here.
3. ORIGINAL PROJECT DESCRIPTION AND LESSONS LEARNED

3.1 Project Objectives
The project development objective is to improve rural livelihoods and reduce poverty by developing and strengthening community-based approaches to managing selected tank systems. The project aims to demonstrate the viability of a community-based tank improvement and management approach by returning the main responsibility of tank development to people on a selected basis. If successful, the project would provide a useful model for scaling up this innovative approach state-wide. The poverty focus of the project is based on geographic targeting of taluks across the state with a high incidence of poverty. Within these taluks, the selection of individual tank systems will be based on community demand.

3.2 Project Components
3.2.0. Establishing an Enabling Environment for Tank System Development
The importance of establishing an enabling environment and a solid legal and institutional basis for community-based tank management is critical for the success of this project and for the sustainable development of tank systems across the state. The first subcomponent focuses on developing a conducive policy, planning, and legal environment while the second subcomponent focuses on providing effective project coordination and management.

3.2.1: Policy, Planning, and Legal Environment: GoK has put in place legislation and institutions to support community-based approaches to tank system development and management. The activities in this subcomponent are designed to further deepen these progressive reforms for all tank systems across the state. The activities to be supported include: (a) preparation of proposed legislation (i.e. Community-Based Integrated Tank Management Act) which would address issues related to inter alia tank based rights (e.g. water, fisheries, silt); operation and maintenance responsibilities and water charges; role of PRIs and GoK; treatment of safeguard issues including resettlement and rehabilitation; and would provide a more solid legal basis for tank management institutions; (b) preparation of a long-term institutional strategy and development plan for the implementation of community-based and demand-driven tank management with a specific focus on the future role of JSYS vis-à-vis the Water Resources Department (Minor Irrigation) for tanks above 40 ha command and on the role of PRIs for tanks under 40 ha command; (c) the development of a decision support system for planning, operation and management of water resources on a sub-basin/watershed basis that can be applied in the context of tanks; and (d) preparation of a possible follow-on project. This subcomponent would finance technical assistance, studies, consultations and workshops, equipment, etc. to undertake the above activities.

3.2.2: Project Management: The activities under this subcomponent would help ensure effective project management through: (a) a GIS-based information system for the project area and for the state; (b) a monitoring and learning system including an independent M&L support agency to support JSYS throughout the duration of the project; (c) two mid-term reviews (MTRs) and consultancies to support preparation for the MTRs; (d) technical support services and studies on a wide variety of important topics related to the development of tank systems (e.g. study on tank-based fisheries systems; study on linkages between user groups and PRIs, etc.); (e) fully functional state and district offices including investments in fixed
assets (e.g. vehicles, equipment, and furniture) and operating expenditures (e.g. vehicle rentals, travel expenses, electricity, printing, etc.); and (f) incremental staff at the state and district levels and small provisions for procuring support from line departments, PRIs, and expert resource groups.

3.3 Strengthening Community Development
Given that the project is premised on community-based approaches to tank management, this component focuses on investment in the local people and institutions necessary for the long term operation and maintenance of the asset created. Without this, returns will decrease over time and remaining benefit flows be diverted to more powerful stakeholders. This component therefore seeks to equip stakeholders with the skills needed to ensure that the local institutions developed under this project function effectively and equitably. This will entail: (i) developing human resources and forming or strengthening existing, local institutions; (ii) developing mechanisms through which the needs of traditionally vulnerable stakeholders can be sustainably addressed; and (iii) institutionalising processes for sustainable management of tanks and derived benefits, which can be replicated across tank development sites within and outside of the project.

3.3.1: Human and Institutional Resource Development. This subcomponent would finance activities associated with institutional and human capacity building. The main project implementation responsibilities at the local level rests with the CFTs and Anchor NGOs - who will help facilitate the formation of TMI and prepare/implement ITDPs. CFTs and ANGOs will be selected based on criteria set forth in the PIP. It is critical that an appropriate number of CFTs and ANGOs are engaged in order to ensure that meaningful dialogue and interaction at the local levels takes place. Lessons from earlier natural resource projects in India and empirical evidence worldwide point to the shortcomings of past community-driven development projects which did not allow for sufficient community-level discussions and negotiations which often undermined objectives of inclusiveness and sustainability. This subcomponent therefore provides funds for contracting the services of 5 ANGOs and about 55 CFTs (during the most intensive phase of the project) to serve as implementing agents. Estimates based on a detailed time utilisation study indicated that a CFT could handle no more than about 40 tank systems over the course of a five year contract.

A second core activity of this subcomponent is a broad capacity building programme for operational and technical skills. Given that many of the institutions at all levels are new, developing and strengthening skills is essential for the project to be implemented successfully. The programme includes information tailored to different audiences including TMI and TUC members, CFTs, ANGOs, JSYS staff, PRI and Line Department officials. The programme on operational skills includes orientation to the processes of a community driven project, group operation and management, inclusion of vulnerable people, ITDP implementation and monitoring and evaluation skills. TMI and TUC specific training will cover group management skills, information analysis and use, legal issues and conflict resolution, building knowledge and use of common principles, rules and processes, etc. Exposure visits to other tank management institutions are also included. The programme on technical skills includes technical aspects of tank operation and maintenance, tank related micro-enterprise and agricultural development. Honorariums and travel costs associated with experts from the State and District Level resource groups providing specialist inputs would also be covered.
3.3.2: **Safeguard and Gender Action Plans.** Activities would include the preparation and implementation of: (a) Tribal Development Plans (TDPs) that covers both Scheduled Tribes and Vulnerable Groups. Scheduled Tribes (STs) constitute about 4% of the state population. While the Social and Environmental Assessment indicated little difference between cultural practices, integration into civil society or access to civic amenities and common properties between Scheduled Tribes (STs) and the general population, STs remain technically classified, according to safeguards definitions, as a vulnerable group. Scheduled Castes (SCs) comprise over 16% of the population and are characterised by poverty, illiteracy, social discrimination, low asset-ownership, and poor access to civic amenities and common properties. The interests of both groups will be protected by the preparation of a TDP for each tank system developed under the project; (b) Resettlement Action Plans (RAPs). The only physical displacement under the project will concern encroached land. Tank Management Institutions will therefore prepare RAPs for individual tanks in which encroachers are vulnerable to loss of financial or material assets; (c) Environmental Management Plans which will include Tank Safety Plans (TSP) and Cultural Property Action Plans (CPAP). The EMP contains measures to mitigate the potential negative impacts and to enhance positive impacts on the environment. Preparation of the EMP will also involve formulating a TSP to ensure structural safety of the tank system and to protect areas downstream. Preparation of the CPAP will help ensure that project interventions do not have adverse impacts on cultural property in the project area; this will be achieved (often) by modifying the project interventions to minimise potential impacts. (d) Pest Management Plans (PMP). The PMP would concentrate on demonstration, training and capacity-building activities for tank users (farmers and other relevant stakeholders), JSYS and other relevant staff and NGOs to make them aware of the potential of induced impacts of increased chemical pesticide use in the project area; and (e) Gender Strategy and Action Plan. While every effort will be made to mainstream gender concerns, the project recognises that women are a particularly disadvantaged group of stakeholders. Hence, funds will be available to support (i) gender-sensitive training for project staff and TMI members and (ii) capacity building programmes for helping women participate more meaningfully in TMIs and build skills and knowledge related to tank systems.

3.3.3: **Planning and Management Support to TMIs.** ITDPs provide the core framework for the development of each tank system. However, TMIs and TUCs may incur costs themselves related to the preparation of an ITDP -- specifically with respect to developing appropriate safeguard and gender action plans. This component will therefore finance activities undertaken by tank users as part of the social and environmental management plan such as workshops, training, study tours and exposure visits.

3.3.4: **Communications:** The Strategic Communications Strategy comprises two complementary components: the behaviour change component and the information component. The project will finance activities related to the following tasks: (i) communications and information infrastructure; (ii) capacity building and training; and (iii) strategy development and implementation.

3.4 **Undertaking Tank System Improvements**
The overall objectives of this component are to (i) improve the physical and operational performance of selected tanks through a range of interventions identified and executed by local tank users, including any necessary treatment of the feeder drainage channels above the tank reservoir, (ii) improve on-farm water management, cropping patterns, technology adoption and crop cultural practices to improve agricultural and horticulture production and
incomes, (iii) establish other income generating activities associated with the tank system, and (iv) identify and prototype other opportunities to optimise the productivity and income generation from tank systems.

A pre-planning review and analysis of some 3,000 candidate tanks within the nine districts and 34 taluks of the project, among which some 2,000 tanks would be selected for treatment, would determine the scope of the component. The scope of work for tank improvement and the supporting activities to improve agricultural and other income generating activities associated with each tank would be determined on the basis of detailed ITDPs prepared through a participatory consultation and decision process with Tank Management Institutions. The actual activities selected for inclusion in an individual ITDP would be chosen from a menu of possible candidate physical works and specific supporting activities for improving agricultural production and incomes and other income generating activities for each tank.

3.4.1: Tank Civil Works Improvement

The objectives of this sub-component would be to improve tank storage capacity, to rehabilitate tank physical structure and infrastructure, as necessary, to reduce siltation by stabilizing drainage lines to the tank, and to improve water distribution and irrigation systems in the tank command area. This would be achieved through the implementation of physical works, as determined in the ITDP for each tank, including (i) feeder channel improvement, (ii) tank bed desiltation, (iii) repairs of breaches to bunds, (iv) repair or replacement of sluices, (v) repairs of surplus weirs, (vi) essential construction/repairs to structures in canal and drainage systems (such as desilting of field channels, construction of outlets, division boxes and water measuring structures) and (vi) construction of water measuring flumes, as indicated below.

<table>
<thead>
<tr>
<th>Component of tank system</th>
<th>Present condition</th>
<th>Menu Items (TMI selects)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feeder channel</td>
<td>Carrying capacity reduced due to siltation and encroachment by cropping/vegetation.</td>
<td>Cleaning, re-alignment of inflow channel, provision of benchmark pillars and model section at 500m interval, and construction of loose boulder and masonry checks.</td>
</tr>
<tr>
<td>Tank bed</td>
<td>Storage capacity reduced by about 30% because of siltation. Low reservoir operating levels to avoid bund failure/collapse.</td>
<td>Removal of silt (quantity to be removed will range between 20 to 30%).</td>
</tr>
<tr>
<td>Tank bund</td>
<td>Scouring and erosion of the bunds; top width reduced to about 1 m; revetment damaged/missing; seepage through the bunds; weed growth (access blocked for O&amp;M and local use)</td>
<td>Bund cross-section rehabilitation and improvement (increase the top width to 2.5m), weed growth removal and repair or provision of revetment.</td>
</tr>
<tr>
<td>Tank sluices</td>
<td>Inoperable or damaged, lack water controlling arrangement; excessive seepage or blockage from siltation;</td>
<td>Repair of structure, provision of water control devices and silt removal.</td>
</tr>
<tr>
<td>Surplus weir</td>
<td>Major damages - causing scouring, foundation failures and apron damage</td>
<td>Repair to the structure and outlet sections</td>
</tr>
<tr>
<td>Main distribution system and OFD works</td>
<td>Main canal length not sufficient; seepage loss; no outlets and water control structures no tertiary network; ineffective water distribution and over irrigation at upper reach; no irrigation at tail end; poor on-farm water management; water logging and no drainage structures</td>
<td>Extension of main canals and selective lining; provision of outlets/tumouts, water control and measuring structures; provision of on-farm water management works, and drains and cross drainage structures where needed.</td>
</tr>
</tbody>
</table>
These improvement works would result in (i) extension of the useful life of existing bunds and sluices; (ii) reduction in leakages and seepage of water through bunds, sluices and canals; (iii) increase in water use efficiency through on-farm development works; and (iv) minimisation of silt in the tanks.

This sub-component would also finance TMI/TUC administrative and management costs related to operation and maintenance of the tank system.

3.4.2: Agriculture and Horticulture Development

The objectives of this sub-component would be to increase agricultural and horticulture production and family incomes in the communities who are partially or completely dependent on tank systems. This would be achieved through (i) increasing farmer knowledge, based on location-specific, on-farm demonstrations of improved on-farm water management practices and improved cropping patterns and crop production practices; and (ii) a range of technical training for farmers and tank water users. The determination of the specific activities to be undertaken at each tank would be based on activities identified and included in the ITDP prepared for each tank.

On-farm demonstrations would be established in a cluster of about 20-30 local tanks, with 80 tank clusters defined for the 2,000 tanks to be included in the project. A total of five demonstrations covering improved on-farm water management, agriculture and horticulture crop production improvement would be conducted in both kharif and rabi/summer seasons over a two-year period following completion of tank rehabilitation works in each local tank cluster. Demonstrations would be designed and supervised by staff from the University of Agriculture Sciences (UAS) and Krishi Vigyan Kendra (KVKs) in project districts and implemented by farmers. Demonstrations would promote the following major technological improvements:

(a) On-farm water management. Demonstrations would aim to highlight improved water scheduling (both timing and quantity) and water-use efficiency practices for a range of alternative crops, as well as land formation and levelling (if appropriate).

(b) Crop improvement. Demonstrations would aim to improve the production and cropping intensity of field and horticultural crops in the command area of tanks through the promotion of better adapted and more productive crop varieties, improved crop cultural practices (INM, appropriate planting arrangement and timing, weeding and IPM, etc.) and alternative cropping patterns.

Training activities would be aimed at increasing the technical knowledge and skills of district and taluk JSYS and CFT staff and farmers in tank command areas. This would include both classroom and on-farm training. Resource persons from the agricultural universities (both UAS Bangalore and UAS Dharwad) and relevant government line departments (agriculture, horticulture, minor irrigation and WARMI) would provide the training for JSYS and CFT staff as well as for selected progressive farmers from local tank communities. Special technical training for women would also be undertaken on topics that are specifically related to agricultural activities in which they are involved or opportunities for them to expand their income generation. General level training, using the farmer field
school training approach, would be conducted in association with the demonstration programme. Selected farmers would also receive additional training through study tours to view and discuss technologies promoted and used in other taluks and districts.

3.4.3: Technical Assistance for Other Income Generation

The objective of this sub-component would be to promote other income generating activities for members of local tank communities who have little or no access to land in tank command areas. It should be noted that the conferring of access rights for water in the tank system should be done in accordance with prevailing laws. Specific technical assistance is proposed to develop the following opportunities in those tanks that are suited to such developments.

**Fisheries.** Fisheries enterprises would be promoted in about 600 tanks (30%). The programme would comprise: (i) tank rental agreements for landless and poor beneficiaries groups, provision of inputs required for production (fingerlings) and harvesting equipment; (ii) training courses to reach 4,800 persons (men and women) involved in fish production or marketing, including training materials and visits to production and rearing sites; (iii) rehabilitation/construction of two one ha rearing ponds; (iv) technical support for tank user fishing groups and monitoring of production by district and taluk fishery department staff; and (v) recruitment of a technical officer to ensure the coordination between the project unit and the line department. Arrangements would be formalised with the Fisheries Department to provide structured support and travel and subsistence funds would be provided to facilitate their involvement.

**Livestock.** Small-scale intensive forage and milk production enterprises would be promoted in about 200 tanks (10%). *Forage production enterprises* would be established on one hectare of tank command area to produce high quality fresh forage throughout the year to be sold to milk producing enterprises in the tank community. Small-scale, intensive *dairy production enterprises* would be established in the same tank communities. It is proposed that five such enterprises be established with one milch cow per enterprise. Establishment costs would be provided by the project and the owners of the enterprises would be expected to return 50% of the establishment costs. Forage and livestock specialists recruited by the project would promote, set up and provide advice to the enterprises. In addition, in association with the UAS and line departments, they would provide technical training to improve the knowledge and skills of enterprise owners in principles and practices in improved forage production and in improved feeding, health and livestock husbandry.

**Forestry.** Small-scale forestry enterprises would be established in about 400 tanks (20%). *Mixed forestry enterprises* would be established on five hectares of land in the tank foreshore area of selected tanks, where the communities have agreed to such an income generating enterprise. Ownership of the enterprise would be invested in selected persons from the tank community who have limited income-earning possibilities. A range of suitable tree species has been identified that provide multi-purpose use and income generating opportunities. Small-scale *tree seedling nurseries* would be established in the same tanks selected for the foreshore planting. A strong demand for tree seedlings is anticipated for farm plantings, watershed area plantings and for home gardens in the general local vicinity of tanks. A single nursery enterprise is proposed for one tank, to be owned, operated and managed by a small group of women who would provide their part-time labour. The enterprise would aim to profitably produce 10,000 tree seedlings annually. Technical Assistance would be provided by forestry specialists recruited by the project, in association with the UASs, who would also provide technical training to improve the knowledge and
skills of participants in principles and practices in improved tree husbandry, forestry and nursery management and production.

3.4.4: Technology Development
The objective of this sub-component would be to develop new technologies suited to the general conditions found in tanks and their dependent communities. This would consist of pilots and studies on (i) efficient irrigation methods such as testing and developing low pressure drip and pipe irrigation systems over a two-year period (for example for growing grapes and lemons); (ii) conjunctive use of surface and groundwater in tank command areas; (iii) innovative equipment for tank desiltation; (iv) other equipment for water control, monitoring, and management; and (v) promoting new pilot technologies for the development of crops that have a comparative advantage in Karnataka and are being promoted by GoK.

Implementation Responsibilities for Undertaking Tank System Improvements
Integrated Tank Development Plans (ITDPs): The participatory preparation of ITDPs between the Tank management institutions (TMIs), CFTs, and technical specialists will include identified plans for tank improvement, demonstrations, training and technical assistance.

Tank and feeder channel rehabilitation: A TMI will be responsible for the execution of the improvement works (including feeder channels) in accordance with the modalities agreed upon under a MOA for each tank and under the guidance of CFTs. As stipulated in the MOU, the TMI will decide on the amount and type of work to be given to a contractor and the paid labour work to be undertaken by the TMI members themselves.

Demonstrations and training: On the basis of individual ITDPs, representatives from TMIs, together with CFTs and technical specialists from the universities and government line departments, will collectively decide on the appropriate demonstrations and related technical training to be conducted at each cluster of tanks. The design and implementation of the demonstrations will be the responsibility of the universities and KVKs in collaboration with the line agencies at the taluk level and the TMIs. The JSYS, in conjunction with resource persons from the universities and line agencies, will have overall responsibility for organizing technical training, study tours and farmer field school training farmers in association with demonstration field days.

Technical assistance and technology development: The JSYS and CFTs in association with local TMIs will be responsible for defining needs for technical assistance and technology development. The JSYS at the state level will be responsible for recruiting suitably qualified consultants and purchase of any materials and equipment required for the development of other income generating activities and new technologies.

3.5 Environmental Issues
The project is expected to have an overall positive impact on the environment. The main environmental issues examined (and shown in a spatial context in the following Figure) include inter alia: (i) degraded nature of the tank system (e.g. loss of an important common property resource; land degradation in the catchment); (ii) the spatial and sectoral context of the systems (upstream soil erosion and downstream siltation - both in single tank systems and in cascades - with silt accumulation reducing storage and groundwater recharge and increasing the need for expensive desiltation); (iii) the physical characteristics of the tanks (inadequate dead storage, tank safety concerns due to weak bund structure, damaged sluice
and surplus/waste weirs leading to shortages, water logging, and poor water efficiency); (iv) encroachment (of tank bed, foreshore area, streams and feeder channels) and potential effects on cultural property; (v) inefficient use of water in the command (ill-defined irrigation distribution systems and damaged main and field canals lead to low productivity of water and distributional inequities); (vi) increasing fertilizer and pesticide use and declining use of organic manure/compost/green manure; and (vii) contamination of tank water including poor hygiene and possible contamination of drinking water and associated public health concerns.

Figure 3.1: Tank System and Major Issues

The following framework will be utilised to address these issues:
- Consider tanks as part of an integrated system at an individual level (e.g. catchment area, tank and command area) and well as at a collective (e.g. tank cluster, micro-watershed setting) level
- Develop an adequate EMP screening and mitigation framework
- Ensure adequate attention to appropriate catchment treatment to improve investment sustainability
- Design of measures to include and manage conflicts across multiple demands from various stakeholders (irrigation, drinking water, groundwater recharge, livestock,
additional downstream dependent areas, etc.), often competing within and across spatial and sectoral boundaries.

- Consider induced impacts (e.g. pesticide use) in the Pest Management Plan/EMP.
- Mainstream environmental issues into ITDP preparation, implementation, and monitoring utilizing a highly consultative framework.
- Develop adequate capacity for environmentally-sustainable tank management.

In the EMP, measures have been incorporated to enhance the activities that could have a positive impact on the environment such as: improving tank ecology; improving environmental awareness and general tank water use hygiene to improve water quality and associated public health (e.g. mixing of village wastewater runoff into tank, protection of drinking water and drinking water recharge areas, management of waste and manure on tank beds, etc.); promoting the holistic planning of tank systems (catchment, tank, command) for individual tanks and cascades; improving cropping and input practices to reduce chemical pesticide and fertilizer use; and improving tank safety. The project will however have some negative impacts for which mitigation plans (e.g. EMP, PMP) have been developed. Possible adverse environmental impacts include proper disposal of silt; uncertain impacts on groundwater; introduction of fish and trees to the tank system; potential induced impacts of increased pesticide use in the area due to command area rehabilitation (although the project will not finance pesticides); and potential adverse impacts on public health through impacts on the local hydrology and induced pesticide and fertilizer use. These potential changes in hydrology, combined with induced increase in pesticide and fertilizer use and any pre-existing pollution (e.g. from village sewage) into the tank, may change the quality of water in the tank and the groundwater and could potentially have adverse impacts on public health. These changes in hydrology and other impacts will be closely monitored, especially in the initial stages to help guide further project implementation. In addition, potential impacts on cultural property and tank safety has led to the formulation of a separate Cultural Action Plan and Tank Safety Plan as part of the EMP. The provisions of the EMP and the PMP are designed to enable the activities to be in compliance with national and Bank policies and guidelines.

The EMP has recommended a number of key indicators to be monitored as part of the project to reflect the environmental and social objectives and issues. These impact, process, and output environmental indicators, and strategies for monitoring, reporting and use in decision-making are outlined as part of the SEA. The monitoring information would include participatory indicators to be monitored at the TMI level, baseline information to be collected as part of the PRA exercises and surveys, special studies, remote sensing surveys, photographs, and third-party monitoring. Some information will be computerised and spatially referenced in a GIS to facilitate analysis where appropriate. The objective of the environmental monitoring would be to enable quick mid-course corrections in project activities to ensure that the project is environmentally sustainable.

### 3.6 Lessons Learnt

The key lessons learnt from the implementation experience of the project in the last five years are outlined below. An important lesson is that the community-based rehabilitation of tank systems is possible and feasible. Second, projects of this nature succeed in providing a voice to the community in expressing their concerns even at the highest level.

1. The project has created an overall positive atmosphere in the state at macro/policy level. The commitment exhibited by GoK in its vision statement on tank maintenance...
policy for promoting community based approaches for tank management is fairly internalised at the policy level. The process of legal reforms to empower tank management institutions to perform operations and management in a sustainable manner and the currently initiated institutional reforms at state level are pointers to indicate the recognition and acceptance of the viability of community based approach field tested in the past five years. However, notwithstanding the reforms attempted in the legal framework, there is a larger need for sensitisation at all levels on the changed approach of management of traditional tanks in the state.

2. The screening framework involving social, environmental and hydrological parameters was the basis for selection and prioritisation of tanks. A review of experience indicates that more weightage was given to hydrological parameters. There is need for improvement in the screening framework to restore balance among social, environmental and hydrological aspects.

3. Key lessons learned with regard to consultation and participation of stakeholders are the following:
   a) Sense of ownership, participation of people in all the aspects of tank rehabilitation and their organisation are critical not only for sustainable management of tank system but also for successful and continued adoption of improvements relating to new and suitable crops, water management, pest management, etc., demonstrated by the project. To achieve this objective, the project has adopted a project cycle consisting of four months of pre planning phase, four months of planning phase, eight months of implementation phase and four months of post implementation phase. Although this has fairly worked in smaller and single village tanks with homogenous community, the experience indicates that there is need for flexibility to address the seasonal factors involved in the implementation, and lack of cohesion on account of multiple villages under each tank and large size of the tanks. Such flexibility is essential to provide adequate space and time for different interest groups within the community to participate meaningfully in every phase of the cycle.

   b) The project has been designed to adopt a process-oriented mode with considerable focus on the quality of processes rather than physical targets. The experience indicates that the shift in emphasis on reaching the targets from the third year onwards to complete the implementation in the scheduled period has affected the quality of process and social mobilisation to some extent. There is, therefore, need for planning the physical and financial targets in a meticulous manner by considering all the aspects including time and human resources available.

4. The project has provided four institutional options for the community to choose from at the tank level. The experience shows that the two models viz., association of tank users as an independent society and subcommittee of Gram Panchayat (GPSC) under the Panchayat Raj Act have been the chosen models, thus, indicating that these are practically viable. Of these two options, the option of GPSC was availed of in the case of about 5 per cent of tanks and society model has been the most favoured option. In the context of society being the most preferred option, some mechanism/organic linkage has to be built with Panchayat Raj institutions especially to access mainstream programmes and services in the post project scenario.
5. The operational performance of TMIs shows that the planning and implementation of Integrated Tank Development Plans (ITDPs) have been largely participatory and transparent. The experience shows that apart from the TUC, which is a management committee, the participation of various subcommittees/supervisory committees formed within the TMIs needs to be improved to ensure participation and involvement of all stakeholders within the TMI.

6. As per the design of the project there is fair representation of Scheduled Castes, Scheduled Tribes and vulnerable families in the TMIs. Such representation is very well institutionalised with the help of bylaws and guidelines prepared during the course of the project implementation. The most significant learning/experience is that the community in general has accepted/recognised such vulnerable sections as stakeholders in the tank system. However, more focus on accommodating the needs of these sections in the planning and execution of the main components to sustain their continued participation and quality of their livelihoods, is needed.

7. The participation of women in the TMIs is fairly institutionalised with almost equal representation of both the genders in the TMIs’ general bodies. There are some instances where the community has opted for all women management committees. The quality of TMI performance was fairly good in such cases in terms participation, transparency, conflict management etc. This calls for the need for improving women’s participation, empowerment of Women Interest Groups (WIG), involvement of women SHGs in the execution of certain works, in arriving at decisions relating to water management, crop planning issues, etc.

8. The project has well designed R&R policy to restore the livelihoods of project-affected families (PAFs). Though the encroachment issues were identified in about 50 per cent of the tanks, only about 9 per cent the tanks have so far tackled rehabilitation issues as per the project eligibility criteria. Only in such cases were the resettlement action plans undertaken and implemented. The recent impact study commissioned by JSYS has revealed encouraging results on the implementation process and also the social and economic impacts on the families. The study also established the suitability of the policy for the future projects as well. The focus in the follow-on project should be, however, on capacity building and awareness generation on a continuous basis in the backdrop of the staff turnover at the field level.

9. The catchment area treatment plan includes treatment of feeder channels up to 500 meters by constructing suitable silt arresting structures and clearing obstacles to ensure smooth water flow. This was envisaged on the assumption that the other aspects of catchment treatment would be taken care through efforts aimed at convergence with the World Bank supported watershed project. The experience shows that convergence efforts are possible only in a few taluks since there has been no synergy in identification of locations, project cycle timings and different approaches used by both the projects for identification of project areas (Watershed Project has predetermined areas whereas the tank project adopts demand driven approach). The experience shows that there is need for interventions in the higher reaches of feeder channels/drainage to plug deviations, increasing vegetative cover and also empowering the catchment area farmers on better land management and crop
production practices with focus on the capacity building. In order to improve the participation of catchment area farmers in the TMI activities there is need to some of their requirements such as fertile silt for soil improvement etc.

10. The rehabilitation works focused on improving the operational performance of the tanks such as desiltation, repairs and restoration of tanks structures and on-farm development works. These have shown visible impacts in terms of plugging the water leakages, increase in storage, better conveyance in the command areas, incremental irrigation benefits for agriculture, etc. The perceptions of the community, however, indicate that there is need for increasing focus on creating storage and improving the conveyance system to ensure irrigation for the tail end farmers. There is also need for flexibility, simplification of procedures and systems for planning and implementation of civil works component to enable TMIs to own the interventions planned and complete the execution within the planned period. There is abundant indigenous knowledge and skill-base existing in the village, which needs to be given more importance to make this component meaningful and effective.

11. The project has a well-designed environment management plan (EMP) and the framework adopted for the project is fairly mainstreamed into all the project components. The experience of the past five years shows that ITDPs have clear plans on safe disposal of silt, feeder channel treatment in the catchment areas, afforestation and biomass development in the tank areas, IPM and INM as part of agricultural plans etc. The implementation of the above has also been effective to large extent. However, implementation issues such as mobilisation of the required number and type of species, greater synergy between the plan implementation and the seasonal factors, etc., needs to be addressed. The restoration of all the degraded feeder channels beyond 500 meters to improve the inflows into the tank and awareness generation among catchment area farmers needs to be focused in a much intensive manner.

12. The agriculture and horticulture demonstrations have succeeded in the establishment of viable methods to improve water use efficiency (WUE) and agricultural production. The Jalashree method of paddy cultivation (SRI) and the crop specific IPM and INM practices as demonstrated by the project have been well accepted by the farmers. There is a need for improving the approach and institutional mechanism to ensure wider diffusion of the demonstration technologies to large number of command areas and farmers.

13. The fisheries development has shown very good results in terms of production and higher economic returns. This activity needs to be given fillip with focus on creating adequate water bodies and increasing the longevity of water availability in the tanks in additions to increasing the management of capabilities of TMI’s.

14. The project has focused on agricultural marketing aspects in the past two years and the model attempts made towards providing linkages between farmers and markets have shown encouraging results. These need to be further strengthened by evolving a concrete operational strategy and strengthening the institutional capabilities at all levels.

15. The project has transferred 75 tanks to TMIs for management and another 400 plus tanks are in the pipelines for transfer. The initial results indicate that TMIs have exhibited responsibility in performing day-to-day operations and maintenance.
However, there is need for institutional capacity building of TMIs for the post project sustainability, developing an apex body of TMIs and a minimum handholding support.

16. The project has an organisational structure from state to cluster level to shoulder the task of overall implementation and effective facilitation of planning and implementation at the TMI level. At all levels, multidisciplinary specialists have been positioned. This institutional arrangement has been found to be adequate for the overall implementation perspective. The experience, however, shows that periodic assessment of human resources is essential to improve and maintain the quality in the planning and implementation of the project. The frequent turnover of personnel at all levels is an important area of concern. This requires improvements in human resource policies including the selection and recruitment procedures. The participatory nature of the project requires highly skilled and experienced human resources and the future efforts have to be made to position personnel who have the belief in community oriented rehabilitation, requisite skills and proven experience for the community oriented project.

17. The project has designed capacity building strategies, plans and modules, which were evolved from the experience gained during the first two years of implementation. These have the potential to make the project implementation effective. However, from the middle of the project period, frequent turnover of the staff at all levels has affected the overall implementation of capacity building plans. With more number of persons joining the project from the line departments, there is need for frequent vision building exercises and training to equip them to handle the implementation in consistence with project approaches. It is also learnt that more focus needs to be made on experiential learning with frequent exposures and intra TMI interactions.

18. The Monitoring and Learning (M&L) system of the project is suitable for monitoring the process in the planning and implementation of multidisciplinary components, impact assessment and capture the lessons from the same. However, there is need to strengthen the institutional performance tracking and process monitoring aspects of the M&L system to keep track continuously the process quality and also physical targets. There is also a need to improve the institutional capacity with adequate specialised manpower at the state and district levels to handle implementation issues in more intensive and effective manner.
4. ANALYSIS OF ALTERNATIVES

The project was initiated in July 2002 with the plan of concluding it by January 2009. The total target of tanks to be rehabilitated through the involvement of the community in an integrated manner was 2,000 spread over 34 taluks encompassing six agro-climatic zones. The most recent figures on the status of implementation show that the implementation under various phases is being carried out in all the targeted tanks. About 540 tanks have completed all the phases of project cycle and are on the verge of transfer to TMIs. About 1,140 tanks were under implementation phase; of them, more than 40 per cent tanks are expected to complete implementation phase before the monsoon season of current year. The remaining tanks are in either the preplanning or planning phases.

During the design of this project, it was expected that it should also have positive impacts on the environment. Specifically, it was expected that the rehabilitation of tanks would result in the augmented supply of irrigation water, ground water recharge, better quality of drinking water, increased agricultural production and productivity, increased employment and well-being of stakeholders and better management of natural resources. The experience shows that these have been achieved in the case of tanks covered in the current project.

It is, therefore, important to extend the project benefits to the areas hitherto uncovered not only for poverty alleviation but also for protecting the environment. Below, we make an objective analysis of alternatives available for restoration of traditional tank systems. A brief analysis of alternatives is provided below to weigh different choices and expected environmental impacts of major interventions.

The consultations held at different levels reveal that all the stakeholders (staff of SPU, DPUs, CFTs and the community) have been very happy with the design of the current project. According to them, the design would address the outstanding problems relating to the tank rehabilitation – issues relating to catchment area, foreshore area, tank bed, bund strengthening, command development, and incorporation of tribal, gender and environmental interests. *Hence, the scenario of a new project with different components is ruled out.* The widespread opinion was that the following are required in the design of the original project.

- Fine tuning of some of the components
- Additions to criteria adopted in the case of implementation of few of the components.
- Marginal changes in the implementation strategies.

In the matrix provided below, we will compare two scenarios, no project and continuation of the same project with a few modifications in new areas.
## ‘Social and Environmental Assessment Study’

<table>
<thead>
<tr>
<th>Concern</th>
<th>No Project</th>
<th>Continuation of the same project</th>
</tr>
</thead>
</table>
| **Catchment area** | - Degradation of land resources will continue unabated.  
  - Soil erosion, loss of fertile top soil and nutrients  
  - Feeder channels and natural waterways blocked and diverted by encroachers  
  - Unsustainable land use  
  - Fragile and poor lands used for cultivation of crops  
  - Sparse vegetation, scarcity of organic manure  
  - Unsustainable use of chemical fertilizers, depletion of natural soil fertility  
  - Degraded pastures and grazing lands  
  - Denudation of forest cover and shortage of fodder and fuel  
  - Siltation of tank bed due to soil erosion in catchment and foreshore areas  
  - Ecological imbalance | - With better awareness and linkage of catchment farmers the arable and non arable lands will be managed in better way to check erosion and nutrient loss.  
  - Treatment of feeder channels and drainage would restore the natural water flow and arrest of silt infiltration.  
  - Improved land use practices and cropping pattern.  
  - Increased vegetation, horticulture and higher mass production, better soil health due to silt application and use of organic manures.  
  - Land treatment with reduced rate of silt accumulation in the tank bed.  
  - Effective institutional mechanism from tank to higher levels for management with better coordination |
| **Tank bed / Fore-shore area** | - Soil erosion due to lack of soil conservation measures and faulty cultivation practices  
  - Impediments for free flow of rain water into the tank will continue due to encroachment  
  - Most of the tanks have accumulated silt and reduced storage capacity by more than half of the potential storage  
  - Tanks are infested with different kinds of weeds and thorny bushes (prosopis juliflora, Ipomia carnica jacq, Zonder grass, etc.)  
  - No vegetative barriers/silt traps of filters in foreshore area  
  - The sluice and surplus-weir are under disrepair  
  - At many places tank bunds/dams have developed cracks/stone pitching has given way and are weak and carry an element of security/safety risks. | - Continued adoption of soil conservation measures and better cultivation practices reduce siltation.  
  - Clearance of feeder channels and drainage with silt traps increase free of flow of water.  
  - Desilting of tank will increase storage capacity.  
  - Tanks will be free from weed infestation.  
  - Foreshore plantation will serve as filters, clear encroachments and availability of biomass for the poor for livelihood strengthening.  
  - Strengthening of sluice, waste-weir and tank bund will plug leakage of water.  
  - Creation of dead storage will enable fisheries, livestock rearing by poor families and availability of biomass and ground water for longer period |
| **Command and adjoining area** | - A sizable area under the tank command is left fallow due to shortage of irrigation water from the tank.  
  - Main and field channels are either damaged, encroached or disappeared due to lack of interest or non-availability of irrigation water from the tank for intermittent periods  
  - Most of the tail-end farmers do not get enough and timely water supply. Suffer losses due to shortage of water during crucial crop growth stage.  
  - Only single crop is grown in most of the command areas  
  - Currently, flood system of irrigation is used wherein water from main sub-channels is released in the field at the higher elevations and is allowed to flow into the lower parts of the command area by gravitation. This leads to wastage of precious water, loss of nutrients and helps the transmission of diseases and pests from one plot to another.  
  - Water is lost through seepage from main channels  
  - Depleting groundwater and lowered water table  
  - Lack of water and vegetation increases the temperature and desiccation effect in the surrounding area. This also results in higher frequency of irrigation | - Productive lands can be brought back under cultivation after the rehabilitation of tanks  
  - Main as well as field channels will be realigned for proper irrigation.  
  - Tank User association Groups will be responsible for equitable distribution of water among the Command farmers. TMIs will decide better water distribution schedules and water management methods.  
  - Crop intensity would increase leading higher productivity and incomes.  
  - The irrigation canals with lining will arrest wastage of water leading to increased efficiency of conveyance system.  
  - Improved methods will lead to increased water use efficiency, improved use of ground water and reduced dependence on tank water.  
  - Improved water storage in the tank and vegetative cover would create moist and humid microclimate leading to reduced requirement of irrigation |
| **Others** | - Shortage of drinking water for animals due to inadequate storage  
  - Drying up of tanks and silt accumulation discourages fishing activity  
  - Non-availability of water discourages aquatic flora and fauna and also does not attract birds and bees  
  - Non-availability of water forces women to wash clothes near the borewell, which supplies drinking water. The washing of clothes near the borewell creates cesspool and breeding place for mosquitoes. Moreover, seepage of water pollutes the underground aquifers with detergents and other chemicals  
  - Dried tanks in the state of disrepair do not provide any aesthetic value but an ugly picture of sick and dead | - Rehabilitation will augment storage capacity of the tank structure and provide drinking water to animals  
  - Availability of water in the tank for a fairly long time provides opportunities for fish culture.  
  - Healthy water bodies attract water loving birds and insects. Many of these are predators of crop pests while others like honeybees help pollination.  
  - Availability of water in the tanks for washing clothes and to meet other domestic needs will keep the environment clean and neat. The flora and fauna present in the tank has a great capacity to degrade the hazardous chemicals and thus keep the system healthy.  
  - Tanks with clean water, surrounded by good vegetation, with birds around provide a pleasing look and great aesthetic value |
The analysis carried out in the original project design was cross-checked with stakeholders during the consultations and field visits. The impact assessment reports were reviewed to point out the various environmental impacts on the rehabilitated tank sites. This analysis indicates that the anticipated social and environmental impacts in the case of “with project scenario” have been realised to a large extent and only the degree of individual impact varies across tanks. This clearly shows that the existing design is realistic to replicate and the new options are very limited ruling out the scope for any changes in the design. However, the required improvements and refinement in the implementation approach and strategies would result in maximisation of environmental impact.
5. BRIEF OUTLINE OF THE PROPOSAL FOR ADDITIONAL FINANCING

The Government of Karnataka (GoK) has submitted a proposal for additional financing to the World Bank in March 2006. The ongoing pilot project in 2000 tanks spread over 34 taluks of the state has successfully established the viability of community based approaches for tank system development and management. The tank management institutions established for individual tanks have successfully demonstrated that the involvement of the community will provide participatory and transparent governance at the tank level. The focus laid on tank system improvement has yielded encouraging outcomes in terms increased storage, increased water use efficiency and agricultural productivity, improvements in the ground water availability, induced environmental impact, incremental income and employment generation to the rural poor.

GoK envisages extending this approach and the current project to other priority taluks to improve tank systems in a community based approach. By adopting the selection criteria of the project and also component backwardness index (CBI) developed by the Regional Imbalances Redressal Committee constituted by the state, the following districts and taluks have been proposed to be covered in the extended programme.

Table 5.1

<table>
<thead>
<tr>
<th>Sl</th>
<th>Name of the district</th>
<th>Number of taluks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Belgaum</td>
<td>7</td>
</tr>
<tr>
<td>2</td>
<td>Bijapur</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>Chikamagalur</td>
<td>6</td>
</tr>
<tr>
<td>4</td>
<td>Davanagere</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>Dharwad</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>Gulbarga</td>
<td>2</td>
</tr>
<tr>
<td>7</td>
<td>Hassan</td>
<td>3</td>
</tr>
<tr>
<td>8</td>
<td>Shimoga</td>
<td>5</td>
</tr>
<tr>
<td>9</td>
<td>Uttar kannada</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>39</strong></td>
</tr>
</tbody>
</table>

Through the additional financing, it is proposed that about 1,200 tanks in the select 39 taluks spread over the nine districts will be covered (Table 5.1). Based on the experience of the ongoing project and also in consonance with the national framework for restoration of water bodies issued by Government of India, it is proposed that tanks with command areas of more than 20 hectares will be covered. This is mainly keeping in view the economic feasibility of investments made on tank system improvements. The extended period is planned up to 2012 (3 years) and the implementation is proposed to commence from the last quarter of 2007 to ensure the availability of at least 4 working years to complete the tank level project cycle. Keeping this time factor in view, tanks in the range of 20-100 hectares command area are proposed to be covered. It is estimated that about 80,000 hectares of command area will be covered under the proposed programme.
The additional financial proposal is also designed on the same pattern of the ongoing project and it will have following three main components:

a. Establishing an enabling environment.
b. Strengthening community development
c. Tanks system improvements

The project cost is estimated at about US$ 100 million with the same cost sharing ratio as the existing project between World Bank, GoK and the community.
6. METHODOLOGY

6.1 Introduction
The methodological approach adopted in this study is to channelise the existing knowledge and information through different methods. The study recognises that considerable knowledge exists in the form of not only reports and secondary data on the implementation but also accumulated knowledge with different stakeholders at the state, district, CFT and village levels. The present study attempts to consolidate all this information into a comprehensive whole, which will help make appropriate suggestions towards modifications. Further, participatory approaches will be adopted by sharing this information with the key stakeholders at various levels so that the suggestions made are agreed upon by them and are need-based from the field rather than top-down.

For the purpose of the study, the districts of Kolar and Tumkur have been purposively selected because these two districts accounted for 70 per cent of the total number of tanks treated in the state. This implies that there is high concentration of the knowledge on project implementation in these two districts. In order to obtain information on wider experience, consultation meetings were held with TMI representatives from other selected districts.

The study focused on tanks treated during 2\textsuperscript{nd}, 3\textsuperscript{rd} and 5\textsuperscript{th} phases because: 1) Implementation and handing over has been complete in the case of most of the 2\textsuperscript{nd} phase tanks; 2) Implementation has been complete or is nearing completion in the case of the 3\textsuperscript{rd} phase tanks; and, 3) Implementation is in progress in the case of the 5\textsuperscript{th} phase tanks. This method would provide a good idea on whether the approach and implementation strategies changed over time.

The detailed methodological steps adopted in the study are as follows.

6.2 Review of Existing Studies
A detailed desk review of the following list of documents was undertaken as a first step in our methodology.

- The policies and plans as per Project Implementation Plan.
- The policy and operational guidelines issued from time to time.
- Periodical Monitoring and Learning reports.
- Reports generated from Integrated Information Management System of the project.
- Thematic study reports generated by M&L Agency.
- Impact assessment reports carried out by M&L agency.
- Review of Aid-Memoires.
- Field assessment and consultations.

6.3 Consultation Meetings
Consultation meetings were held with specialists and stakeholders at different levels. First, a brainstorm meeting was held with specialists from the State Project Unit (SPU) to obtain their experience with approach, framework and implementation strategies adopted in the project. The meeting also aimed to obtain their suggestions towards improvements in the proposed project. Second, consultations were held with staff of DPUs in Kolar and Tumkur districts to acquire a district-level picture on the implementation and the district-specific issues, if any.
Third, consultation meetings were conducted with the Cluster Facilitation Teams (CFTs) in each district to obtain the perception of NGOs involved in the implementation of the project. Fourth, representatives from 20 randomly selected Tank Management Institutions (TMIs) of tanks belonging to different implementation phases were called for consultation meetings in the selected districts as well as others. The outcomes from these consultations provided the micro-picture or the ground level reality on the implementation of the project and constraints faced in different areas. They also provided a comparative picture on the implementation of the project in tanks belonging to different phases. The consultation meetings at these three levels were conducted using structured checklists for discussion.

6.4 Field Visits
Visits to a random sample of 12 tanks in the two districts were undertaken to examine closely the various aspects put down under the specific tasks. The following method was adopted in the selection of sample tanks. All the project tanks in the two districts were classified as under Table 6.1. In all, six tanks from the Tank Management Institution (TMI) model and six from the Gram Panchayat Sub Committee (GPSC) model of tank management were selected. From each of these sub groups, 3 tanks of command area of more than 40 ha and 3 tanks of command area of less than 40 ha were selected. In all, four tanks were from the 2nd phase of project implementation; four were from the 3rd phase and four from the 5th phase.

Table 6.1: Classification of tanks for selection in Kolar and Tumkur

<table>
<thead>
<tr>
<th>Phase of project implementation</th>
<th>Tank management institution Model</th>
<th>Gram Panchayat Sub Committee Model</th>
<th>Total number of tanks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tanks &lt; 40 hectares</td>
<td>Tanks &gt; 40 hectares</td>
<td></td>
</tr>
<tr>
<td>2nd Phase</td>
<td>1</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>3rd Phase</td>
<td>1</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>5th Phase</td>
<td>1</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>3</td>
<td>3</td>
<td>12</td>
</tr>
</tbody>
</table>
7. SUMMARY OF CONSULTATIONS

7.1 Introduction
The study team adopted the method of holding consultations with key stakeholders at different levels. Beginning with brainstorming session with subject experts at SPU, the consultations were held with the staff of DPUs in Kolar and Tumkur, CFTs in these two districts, representatives of TMIs from several districts and with members of TMIs at the village level. In what follows, we will provide only a summary of these consultations as the issues emerging from the discussions are discussed in detail in Chapter 8 and suggestions to update the existing framework are provided in Chapter 9.

7.2 Brainstorming Session at the State Project Unit
One-day brainstorming session was held at the JSYS office to obtain an overview of issues involved in the implementation of the project and to prioritise them for detailed discussions at the district and sub-district levels. The meeting was held with the Executive Director of JSYS, the sector specialists and the engineers from the SPU.

A brief presentation was made by the study team covering the objectives of the study, detailed tasks assigned to the study team, methodology to be adopted in the study and issues to be addressed in the study. After the presentation, the following questions were put forth to the participants to facilitate focused discussion.

- How were the project-plans implemented?
- What experiences, outputs and outcomes were obtained?
- Was the implementation done as per the design or was there any deviation from the designed plans?
- What were the difficulties/ constraints faced in the approach, strategy, financial allocations, institutional arrangements, etc?
- What suggestions can be made for modification/ improvements of plans?
- What are the critical issues to be probed further during the field assessments?

A lively discussion followed. The participants were of the opinion that the project, in general, has been implemented by and large as per the design, and that the approach, framework and implementation strategies were apt for the community based rehabilitation of tanks. Detailed information was provided on the outputs and outcomes achieved as a part of the project.

The participants also noted that there were some issues relating to the implementation of the project components. Key areas of concern expressed them were the following. 1) Screening framework was not uniformly adopted in the way that it would result in the selection of appropriate, viable and needy tanks. 2) There is scope to improve the method of selecting CFTs. 3) Monitoring and learning component suffered due to delays in undertaking the baseline survey, inability to use the baseline information collected by TMIs and CFTs, inadequate staff for the purpose, etc. 4) Whether the project components such as catchment area treatment, desilting, strengthening of tank bund, command area development, etc., resulted in the desired outcomes. 5) Issues pertaining to the implementation of plans relating to tribal development, mainstreaming of gender, environmental management, pest management, etc. were also raised. 6) There was intensive discussion on the safety of tanks. The participants requested the study team to look into these issues in depth when it visits the districts for the fieldwork.
7.3 Consultations with the Staff of DPUs
In the consultation meetings held with the staff of District Project Units (DPUs), the study team presented the original project design and requested the staff to share their experiences with regard to different components of the project. In these meetings, the sector specialists as well as the engineers were present. The meetings were chaired by the District Project Coordinator.

In general, the participants stated that the design of the project was very good and that there was no need to change the approach, framework and components of the original project. The DPUs were able to support the communities in the rehabilitation of a large number of tanks. The staff expressed satisfaction to be associated with the community based rehabilitation of tanks.

The key areas of concern expressed by DPUs are the following. First, does the screening framework result in the selection of viable tanks? Second, what is to be done to select qualitative CFTs, ensure staff retention in the organisation, recruitment of experienced staff, etc? Third, how does one ensure even workload across the project years? Fourth, how does SPU ensure that there is adequate staff with DPUs, training is regularly provided, etc? Fifth, how can decision making be further decentralised?

7.4 Consultations with CFTs
The consultations were held with representatives of CFTs in the two districts. The participants were team leaders, engineers, agricultural specialists and social specialists. The key concerns raised in these consultations are as follows. 1) The need to change the criteria (especially those relating to hydrological aspects) to select tanks. 2) More time required for the selection of tanks, pre-planning, planning and implementation phases. 3) Need for training and capacity building in view of frequent turnover of the staff (especially engineers and agricultural scientists. 4) More salaries for these staff to attract and retain good staff. 5) Specifying even targets on the rehabilitation of tanks across the project years. 6) Fine tuning of project components or marginal changes in the implementation strategies.

7.5 Consultations with Tank management institutions (TMIs) in Selected Districts
The consultations with the TMIs were conducted in three parts – with tanks in the second, third and fifth stage of interventions. The methodology for these consultations was as follows. Ten tanks from each of the stages were randomly selected for the selected districts. One or more representatives and members of these TMIs were invited to take part in the meetings with the study team. The number of participants who ultimately came for the consultations ranged from 3 to 9 TMIs per batch per district. A majority of the participants were men, while the representation of women in each meeting was not more than five. The issues discussed started with their experiences right from the pre-planning stage up to what has been undertaken thus far. The key issues raised in these meetings are: 1) Mismatch between the proposed and sanctioned budgets for some reason or the other. 2) Lack of transparency regarding why the budgets were cut. 3) How to harmonise the need to fix standard rates for treatment and community needs. 4) The need to provide proper awareness and build the capacity of the community to match different rates for different types of works with priority needs. 5) The need to increase the project cycle to three years to accommodate the problems posed by the monsoon, etc. 6) The rationale for fixing only 500 metres for treatment of feeder channels. 7) The reasons why the community preferences in terms of catchment treatment were not respected by project authorities. 8) Greater control of the community over the agencies preparing topo surveys and undertaking desiltation activity. 9)
How to ensure that there is greater relationship between desiltation and environmental promotion on the one hand and protection of poor farmers, on the other. 10) Greater involvement and organisation of the poorest and women in the implementation and management of the tank. 11) Command area treatment should take the distribution of water to the tail end farmers into serious consideration. 12) The issue of grass turfing vs. hemata seeds.

7.6 Field Level Consultations
To understand the ground level reality on the implementation of the project, each of the sample villages and tanks were visited. The methodology adopted during the visits is as follows. To begin with, a transect walk was undertaken along the foreshore area, tank bund and command area to obtain a comprehensive picture on the work completion, outstanding issues from the people’s point of view, etc. Knowing these issues beforehand helped to raise all the outstanding issues in the group discussions held separately with TMI representatives, command farmers, landless households and women. This was followed by a general discussion with the representatives and members of TMIs including women members. The purpose of such discussions with TMIs was to comprehend the process through which the project components were implemented, the problems that they faced and how they managed to cope with the situation.
8. ENVIRONMENTAL AND SOCIAL DEVELOPMENT ISSUES

8.1 Introduction
In this chapter, we will discuss the environmental and social development issues. In each of the sections of this chapter, we will first present the original design (the objectives of these components, the processes that are to be adopted, available resources and the expected outcomes) and later identify the issues. It may be noted that various documents such as Project Implementation Plan (PIP), Project Appraisal Document and Gender Strategy and Guidelines for Preparing Gender Action Plan, Monitoring Reports, etc., have been used as background material for different components discussed in this chapter. The issues discussed were identified in the various consultations, the summary of which has been provided in the last chapter, studies conducted by JSYS, monitoring reports, etc. In particular, data collected from 38 TMIIs during the consultations have been extensively used to in this chapter.

8.2 Screening Framework for the Tank Selection
Design
A bottom-up approach in the selection of individual tanks was suggested to ensure strong local ownership and commitment for tank improvement. Demonstration of such commitment was to be seen through the formation of tank management institution, willingness to share the costs and preparation of Integrated Tank Development Plan (ITDP) with tangible milestones indicating seriousness on the part of community. Another important criterion was to ensure that there is focus on poverty and marginalized groups. Preference was to be given to tanks where encroachment was not major issue.

Tanks with high marginal returns to investments would be preferred. Preference would be given to tanks that can ex ante demonstrate high economic returns to investment (ranging from tank rehabilitation to improvements in crop production to multiple uses of the tank). Hydrological considerations, frequent surplus in the tank, rapidly depleting groundwater table in the command and positive environmental externalities will be factored into the calculation of economic returns. Tanks where rehabilitation in the form of desiltation or catchment area treatment would address environmental problems such as water logging, salination, etc., would be preferred.

Issues Relating to the Selection of Tanks
The above social, environmental and hydrological criteria have been, by and large, applied in the selection of tank for the rehabilitation. In general, most of the tanks selected were needy, appropriate and suitable for rehabilitation in terms of economic and environmental returns. Although smaller tanks with homogenous community were selected in the initial phases as there was not much prior experience for either JSYS or CFTs, the proportion of tanks with more than 10 ha of command area increased in Kolar district. As a result the average command area increased in the district. The average command area of tanks selected in Tumkur was higher; this implies that in areas with larger tanks it was possible to select larger tanks. There are, however, a few issues which are important to be raised here for the purpose of learning lessons for the follow-on project.

It was stated that CFTs selected smaller and unviable tanks. The representatives of CFTs, who stated that this was true to some extent, attributed it to the following. First, output based, rather than process based, approach and stiff targets from third phase onwards have
resulted in the selection of a few unsuitable tanks. Second, hydrological criteria, at times have become impediment for the selection of needy tanks. The tank may not have surplus due to encroachment and blockage in the feeder channels, malfunctioning of waste weir and sluice gate and seepage through tank bund. As a result, needy tanks were not selected because tank may not have had surplus in the recent past. Third, the staff turnover in CFTs (especially engineers and agricultural specialists) and lack of training opportunities for new incumbents resulted in poor quality in the selection of tanks. Fourth, shortage of time leading to the inability to adopt qualitative process in the selection has resulted in the selection of a few unsuitable tanks.

There is, therefore, a need to further improve the screening procedure to select viable (medium to large) tanks with high suitability.

8.3 Monitoring and Learning Strategy for Assessing Social and Environmental Impacts

Design of M&L Strategy
The monitoring and learning framework consists of: (i) monitoring core indicators that would comprise both simple, easily quantified indicators and process indicators attempting to assess social and institutional objectives emerging directly from the ITDPs; (ii) tank user self-assessments and feedback focused on self-learning of tank management institutions and other stakeholders in the project on a pilot basis; (iii) internal learning through multi-disciplinary, multi-stakeholder working groups constituted at Taluk, District and State levels that would benefit from Process Documentation Research and Exchange visits; and (iv) impact evaluations periodically over the project period and development audits undertaken by the contracted M&L facilitating agency (Table 8.1). In supporting the monitoring and learning framework, an independent consultant would be contracted to support JSYS in undertaking selected components of M&L as decided by JSYS in consultation with the Bank which would include providing broader technical guidance on M&L. The information emerging from the M&L exercises would be discussed in the working groups proposed above in addition to the respective TMI/Village Assembly - when and where applicable. The monitoring and learning system for the project is provided in Table 8.1.

Issues Relating to the Monitoring and Learning
Internal learning has taken place with the help of process documentation and exchange visits. The project could generate several case studies depicting both successes and failures with lessons learned. Baseline information was collected by CFTs for each tank and this is available in summary form with TMIs. External agency was appointed to support JSYS in the monitoring of the project.

Many issues were raised with regard to the extent to which the monitoring and learning design so beautifully developed in the original project was utilized by TMIs to assess whether desired development outcomes are indeed achieved or not. Another issue is the extent to which M&L system helped JSYS to review whether its efforts are in the direction of achieving the desired results or not was also raised.
Table 8.1: Proposed Project M&L system with suggested instruments

<table>
<thead>
<tr>
<th>M &amp; L System Component</th>
<th>Subject</th>
<th>Instrument</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>i. Performance tracking</td>
<td>Inputs/outputs/Outcomes</td>
<td>ITDP Monitoring and Learning component and its consolidation.</td>
<td>1. TMI– CFT- monthly DPUs – SPU- quarterly</td>
</tr>
<tr>
<td>ii. Institutional Tracking</td>
<td>Organisational learning and performance</td>
<td>Self-Assessment at TMI and JSYS internal unit levels.</td>
<td>1. Annual</td>
</tr>
</tbody>
</table>

The baseline data collected by CFTs for each tank was not adequately used to track the performance due to differing perceptions on the quality of these data and lack of systems to translate these data into process and impact monitoring. External monitoring also suffered due to the following. First, baseline data was not built before the implementation of the project. Second, the baseline data that were collected later on were not widely used. Third, the perception of JSYS officials was that the inputs provided by the external monitoring agency were untimely and inadequate, and there is need for improvement in the functioning of external agency. Fourth, non-involvement of CFT representatives and delays in the process of and communication of results limited the utility of periodic monitoring. Internal monitoring system was based on setting of M&L units at the SPU and DPU levels. The performance tracking suffered due to limited staff, frequent turnover and lack of experience on M&L among the staff employed. Institutional tracking suffered because the formats required for such a tracking were reportedly developed by the external monitoring agency only six months ago (Organisational Self Assessment). These were only field-tested.

In the follow-on project, some of the above aspects need to be taken sufficient care in order to ensure that the M&L system helps TMIs assess whether desired development outcomes are indeed being achieved and JSYS review whether its efforts are in the direction of achieving the desired results, and if not, to make course corrections.

8.4 Consultation and Participation Strategies
The project has been designed for achieving meaningful participation of all stakeholders including vulnerable groups. The project was expected to employ Community-Driven Development approach which provides for representative and transparent decision making processes within the communities. The communities participating in the project would be socially mobilised to form TMIs, which will plan and implement Integrated Tank Development Plans (ITDPs).

Tank communities were involved during the preparation of the SEA and the Institutional Study. The different interests of tank users were explored, using participative and interactive techniques, and have provided major contributions to the overall design of the project. These studies identified the need for a structured process in which different interest groups could participate to develop a plan for tank management. JSYS has further developed the
framework of the ITDP. This has been pre-tested with tank communities and has been refined in relation to both elements of the ITDP and the way it is used to ensure inclusion of all stakeholders in decision-making and management.

Project preparation activities are also expected to result in the identification of organizational options most appropriate for collective and inclusive management of tanks in different locations. Tank communities have been given a choice of four organizational options for the structure and membership of TMIs/TUCs. While these vary in terms of the nature of their links with the Gram Panchayat, each attempts to offer an arrangement, which can maximise effective interaction with this elected body while minimizing problems that might occur in certain locations where the panchayat’s performance is unpredictable. Linkages with the Zilla Panchayat and district level line departments are built into the project structure through a specially convened ZP Joint Committee. At the taluk level linkages with line departments will be sought through CFT members attending monthly Taluka Production Committee meetings.

Communities participating in the project have been expected to form TMIs, prepare and implement ITDPs (including suitable cost-sharing of investments), assume Operations and Maintenance (O&M) responsibility for the tank system and self monitor those project impacts and outputs which can increase their management effectiveness. The involvement of vulnerable groups (e.g. women, landless, and SC/STs) in TMI activities and decisions will be promoted and monitored through both the organizational structures of these local organizations and through the locally developed rules of operation. The project would provide support (including capacity building) to TMIs and PRIs to strengthen their participation in planning, implementation and monitoring of the project.

**Issues Identified Through the Field Level Assessment**

PRA has been undertaken by and large in all the villages. Between three and five groups had been formed by the households and the different aspects of the tank rehabilitation (catchment area, command area, water spread area and bund, SC/ST development, gender action, etc) had been discussed for 2 – 5 days. In most of the cases, officials from the DPUs and CFTs were present during the PRA processes. CFT engineers also took part. However, the frequent turnover affected this important component to some extent.

The PRA was stated to be an effective exercise involving a majority of the households in the village in the cases of most of the tanks. In some of the villages, it emerged that the households with land in the command area had to put in considerable effort to ensure the participation of those without land and whom the tank rehabilitation would not directly affect. However, they did not shirk this responsibility and ensured that the marginalised households were also included in the PRA exercises and the planning processes. Women and landless groups have also been identified and encouraged to participate in the decision-making processes.

Therefore, the participation and consultation strategies have been successful as far as involving as wide a range of stakeholders as possible was concerned.

However, some implementation loopholes have come in the way of widespread participation of the community in the tank rehabilitation and management process. These have been discussed below.
It was found in the field that the project has well defined process activities built into the ITDP cycle. It has envisaged a series of consultations with stakeholders from the preplanning to the post-implementation phase. These consultations are also well sequenced and the project guidelines sufficiently describe the various participatory methods to be used, broader issues to be discussed and decided, etc.

It has been noticed that the focus on qualitative consultations was reduced after the middle of third phase of tank due to work pressure and staff turnover. As a result, the consultations with individual stakeholder groups (landless, women, etc.) during the pre-planning, planning and implementation stages were compromised. The consultation strategy, which aimed to build vision among different stakeholders, gradually became more of PRA exercise confined to a few days of intensive consultations.

In particular, the quality of processes adopted was found to be weak with reference to the following critical areas.

1. Identification of stakeholder groups (including gram panchayats) and subsequent consultations with individual stakeholder groups on institutional options, project components, objectives, tank management responsibilities.
2. Consultations with command area farmers to get their consent at the beginning to assume O&M responsibility of command area management.
3. Orientation/awareness to TUC/GPSC on planning processes, ITDP components, ITDP features, planning processes, roles and responsibilities to WIG members, etc.
4. Consultations with identified families on their socio-economic conditions, livelihood status, past government programmes, mobilization, etc.
5. Discussion/ consultations with line departments on programmes and services available for women and vulnerable families.
6. Awareness/orientation on preparation of estimates and budget plan.
7. Consultations during the planning and post implementation on issues such as O&M, crop and water management etc.

Another important issue was that all the matters tended to be discussed at the Gram Sabha rather than with individual stakeholders prior to the Gram Sabha meeting. The individual meetings with the marginalised groups are particularly important since these groups typically do not attend the Gram Sabhas. In effect, not much has been done by way of participation and consultation with individual stakeholders before the actual PRA commences and everything has been discussed in a somewhat hasty manner during two to three days of PRA.

Plans were prepared by the community and budgets specified. However, there was a mismatch between the budget amounts requested by the community and those sanctioned to them. Table 8.2 has been prepared with the data collected from 38 TMIs. It can be seen from the table that in a large proportion of TMIs, there had been considerable shortfall in the amounts that were ultimately sanctioned to the community.
### Table 8.2: Distribution of tanks (per cent) in each batch by proportion of sanctioned amount to the planned budget

<table>
<thead>
<tr>
<th>Sanctioned amount as % of the planned budget</th>
<th>Batch 2</th>
<th>Batch 3</th>
<th>Batch 5</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;= 25%</td>
<td>13.33</td>
<td>0.00</td>
<td>8.33</td>
<td>7.89</td>
</tr>
<tr>
<td>25 – 50%</td>
<td>46.67</td>
<td>27.27</td>
<td>16.67</td>
<td>31.58</td>
</tr>
<tr>
<td>50 – 75%</td>
<td>20.00</td>
<td>45.45</td>
<td>41.67</td>
<td>34.21</td>
</tr>
<tr>
<td>&gt; 75%</td>
<td>13.33</td>
<td>18.18</td>
<td>33.33</td>
<td>21.05</td>
</tr>
<tr>
<td>Not aware</td>
<td>6.67</td>
<td>9.09</td>
<td>0.00</td>
<td>5.26</td>
</tr>
</tbody>
</table>

An important finding has been the gap between the community estimates and sanctioned budgets has been declining. Thus, the proportion of TMIs obtaining more than 75 per cent of their requested budgets has gradually increased. This implies one or more features of the planning process. First, there has been greater awareness among TMIs, CFTs and JSYS about the problem of mismatch and efforts have been made to reduce the gap. Second, CFTs have been more successful in convincing the communities about which aspects of tank rehabilitation are to be covered within envelop of the resources available for each tank. Third, the communities have been of later more successful in prioritising their needs and requesting the budgets accordingly.

Nevertheless, the mismatch has been happening due to the following reasons. First, in some cases, the community was not aware that they would have to mobilize contributions from the stakeholders and therefore, they had over-budgeted. But ultimately, many of the households in the village did not pay the contributions. Second, the community was not aware of caps specified on per hectare rates for ITDP. Therefore, they had quoted some amounts but did not get that. Even the engineers who took part in the PRA and budget preparation did not give them any orientation about this. Sometimes, between the time that the money was sanctioned and the time that some portions of the work were actually undertaken, there would be an increase in the rates, which affected the quantity and quality of work.

Another reason for the shortfall in the sanctioned amount was that the project did not allow for the quantum of desiltation that the community had put in the plan prepared. We will throw more light on this under the environment management plan.

There was some dissatisfaction about the one-year period specified for the implementation of ITDP. Most TMIs felt that this was not sufficient given that their interventions depended on the seasonal conditions. For instance, in some cases, desiltation was the main intervention to be undertaken, and the amount reached the community in the middle of the monsoons, at which time, desiltation was impossible. By the time the tank dried out completely and the time was appropriate to undertake this work, the one-year period was over and the money had gone back.

A close examination of the mis-match between the proposed and sanctioned budgets revealed that while the genuine concerns of the community were not incorporated into the approved ITDP, in some cases, even the community was not fully justified in requesting large amounts. What, however, was the issue leading to reduction in the budget was not effectively communicated to TMIs and community at large. The communication between JSYS and TMI/Community with reference to the circumstances leading to the reduction in budget needs to be improved to sustain the motivation and participation of all stakeholders.
8.5 Resettlement Action Plan (RAP)

Design of RAP

In order to minimize the adverse effects on ‘Project Affected Families’, resulting in displacement (physical or economic or both) during rehabilitation of the tanks, a Resettlement Action Plan has been developed. The main objective of RAP is to describe the process how the resettlement issues will be addressed under the project when the TMI starts preparing and implementing project activities in a locality.

The Resettlement and Rehabilitation (R&R) policy has been formulated by the Government of Karnataka to achieve the following two objectives.

(1) to avoid or minimize the possibilities of adverse effect resulting in displacement (physical or economic or both) of people in the project area, and

(2) to minimize the hardship to the affected families, enhance, or at least restore their livelihood opportunities where displacement is inevitable due to technical reasons of the project design.

The affected families can claim R&R support when they are losing land either encroached or own, losing physical structures (e.g., house, well), losing other assets like trees, crops, etc., losing livelihood and, losing access to common property (water resources, grazing lands, village forest, etc) and religious places belonging to community. To claim, first of all, a household should have been dependent on such encroached land at least for three years. Some of the specific entitlements include “land for land” wherever feasible; skill development to take up income generating activities, financial support in establishing income generating activities, access to institutional credit and government programs, support for marketing and additional public distribution system quota for three years. It may be noted here that under R&R policy, members of Project Affected Families above 18 years as on the date of socio-economic survey, should be treated as separate family units for R&R assistance.

Experience of Implementing RAP

Resettlement Action Plan has been widely considered to be successful in making compensation arrangement to the affected families in the form of either land, provision of income generating assets, skill development, etc., and mitigating the adverse effects of displacement and reduce poverty among affected families. This was because of the following. First, voluntary surrender was the dominant phenomenon. Second, the proportion of cases involving compensation has been low. Third, the issue of encroachment and addressing this problem at the village level did not result in divisiveness within the community in a large number of cases. Fourth, the RAP component succeeded in solving an age-old problem of encroachment of tank bed and feeder channels. Finally, trenching and boundaries ensured that there would not be any more encroachment.

A few issues have been identified by us in the consultation meetings, and the same have been highlighted by the study on Impact Assessment of RAP and Review of R&R Policy under KCBTMP. First, there were delays in obtaining the compensation. Where there is frequent turnover of the staff at CFTs, the affected families could not obtain satisfactory service from the implementing agencies. Second, the livestock assets provided as part of relief package were not insured in a few cases, and this resulted in loss of assets and obstacles in reducing poverty among affected families. Third, the awareness on R&R component among affected families, implementing agencies needs to be improved. This is especially the case in the context of frequent turnover of the staff at different levels.
8.6 Environment Management Plan

*Design*

The project is expected to have an overall positive impact on the environment. The main environmental issues incorporated into the project design were degraded nature of the tank system, the physical characteristics of the tanks encroachment and potential effects on cultural property, inefficient use of water, increasing fertilizer and pesticide use and declining use of organic manure/compost/green manure and contamination of tank water including poor hygiene and possible contamination of drinking water and associated public health concerns. The main interventions to be undertaken to address these issues are as follows:

- Consider tanks as part of an integrated system at an individual level (e.g. catchment area, tank and command area) and well as at a collective (e.g. tank cluster, micro-watershed setting) level
- Develop an adequate EMP screening and mitigation framework
- Ensure adequate attention to appropriate catchment treatment to improve investment sustainability
- Design of measures to include and manage conflicts across multiple demands from various stakeholders (irrigation, drinking water, groundwater recharge, livestock, additional downstream dependent areas, etc.), often competing within and across spatial and sectoral boundaries
- Consider induced impacts (e.g. pesticide use) in the Pest Management Plan/EMP
- Mainstream environmental issues into ITDP preparation, implementation, and monitoring utilizing a highly consultative framework
- Develop adequate capacity for environmentally-sustainable tank management.

*Issues relating Environmental Management*

In this section, we will discuss the experience of the different tanks in screening environmental issues and inducing positive impact. We cover catchment area treatment, tank bed interventions, tank bund treatment, command area treatment (construction of distribution channels, introduction of less water consuming crops, water distribution, improved crop plans, etc.). We also discuss pest management plans and water quality. The discussion in this section is based on the detailed data collected from 38 tanks consulted as part of this study.

*Catchment Area*

The treatment of the catchment area was stated to be highly satisfactory or satisfactory in the case of about 68 per cent of the TMIs consulted in the district level meetings (Table 8.3). These TMIs reported that the construction of checkdams, boulder checks and vegetative checks have curtailed the flow of silt into the tanks to a significant extent. A few of the TMIs have also stated that as compared to the pre-project phase, there was reduction of flow of silt into the tank. Second, the feeder channels had been desilted and cleaned. Due to the deweeding and desilting of feeder channels, construction of check dams and foreshore plantation, in most cases, the entry of silt into the tanks had been arrested to a large extent. Third, encroachers of feeder channels, where present, had been vacated and rehabilitated, if necessary, etc. This has also resulted in the improved flow of water. Fourth, the foreshore plantation has also been successful in these cases. The survival rate of plants was stated to be between 50 and 80 per cent.
Table 8.3: Distribution of tanks in each batch (per cent) by perception on catchment treatment

<table>
<thead>
<tr>
<th>Perception on catchment treatment</th>
<th>Batch 2</th>
<th>Batch 3</th>
<th>Batch 5</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highly satisfactory</td>
<td>26.67</td>
<td>45.45</td>
<td>16.67</td>
<td>28.95</td>
</tr>
<tr>
<td>Satisfactory</td>
<td>20.00</td>
<td>45.45</td>
<td>58.33</td>
<td>39.47</td>
</tr>
<tr>
<td>Not satisfactory</td>
<td>53.33</td>
<td>9.09</td>
<td>16.67</td>
<td>28.95</td>
</tr>
<tr>
<td>Not undertaken</td>
<td>0.00</td>
<td>0.00</td>
<td>8.33</td>
<td>2.63</td>
</tr>
</tbody>
</table>

The representatives of many TMIs said that the tank had been filled with much more water than in the recent past. This was, to a large extent, due to the treatment of the catchment area. In such cases, two crops had been possible for some of the command area farmers. In a few tanks, the groups had even been able to start some fisheries development and make surpluses out of this activity. The treatment of catchment area can thus be stated to have been fairly successful.

Nearly 29 per cent of the representatives of TMIs stated that the catchment treatment was not satisfactory. The contributing factors for not being satisfied with the catchment treatment are the following.

- The rule that only 500 meters of length of feeder channel would be treated was considered to be too low and somewhat restrictive. It did not factor in any area-specific differences. In some of these cases, their catchment area and feeder channels extended up to 2 kms and beyond, so it was not possible for them to do a sound job of the treatment under inflexible conditions.
- This restriction had other impacts also. In the case of some tanks, there was some encroachment in the feeder channel beyond 500 meters. Since they could not continue the treatment work so far, the encroachers continued to farm in the feeder channels. This withheld water from getting into the tanks.
- In some of these cases, the community had requested for some number of check dams, vegetative checks, boulder checks and plants for private land, but the sanctioned amount was insufficient for this number. Therefore, the catchment area treatment was still incomplete.
- In a few cases, the catchment area fell in the jurisdiction of the watershed programme undertaken with the assistance of the World Bank, and the plan specifies that in these cases, the interventions will be made under the watershed project. However, there was a lack of coordination between the two projects and in a few tanks, none of the check dams and boulder checks the TMI had requested had still materialized.
- Another problem was the inconsistency between peoples’ plan and what the topo survey showed up. In some cases, the community had identified 4 feeder channels to be treated, but the topo survey indicated only 3. And ultimately, the project went with the result of the topo survey. The community felt very let down because of this.
- In some cases where a tank was part of a cascade of tanks, the draft channel of an upper tank was the main feeder to the catchment area of the tank. Therefore, unless that draft channel was properly cleaned and treated, the catchment area for this tank would still not get sufficient water.
- For foreshore plantation, the amounts sanctioned were insufficient for the number and variety of plants required, quantum of the work involved, re-plantation and maintenance. As a result, fewer plants could be planted where the requirement was
much more, community preference in terms of variety of plants could not be fulfilled, and maintenance became difficult. In these cases, the success rate was stated to be less than 50 per cent; most of the plants survived belonged to honge (pongemia) variety.

- The quality of foreshore plantation also suffered due to limited control provided to environmental specialists in the design. The function of certification of the work completed was assigned to engineers as foreshore plantation was part of tank civil works.

- Foreshore plantation was working well when it was managed by the women SHGs in the village but not always so when the TMIs themselves took up the responsibility of it. One of the problems pointed out for the management of foreshore plantation was that there was a higher discord between the private cost and private benefit. Many of the groups stated that taking charge of monitoring the plantation and growth of such trees imposed a time constraint on the households, and these households attached a higher premium on the opportunity cost of this time. Even if they did put in some effort in managing the plantation, the direct private benefit out of this was very low while social benefit was high. Therefore, when it came to managing foreshore plantation, there was some reluctance on the part of the community to take an active role on a continuous basis.

- The consultations at the SPU, DPU and CFT levels revealed that the catchment treatment, having significant environmental implications, has been linked with tank civil works. Accordingly, when budgets were arrived at DPU by considering the per-hectare rates, the cuts were normally applied to catchment treatment especially foreshore plantation.

**Tank Bed Interventions - Desiltation**

From all the consultation meetings, it was clear that removal of silt was among the single most important tasks preferred by the community in the tank rehabilitation. Therefore, the budget allocation towards this component was extremely important. The hydrological considerations suggest that up to 30 per cent of the silt in the tank bed can be removed. As per the operational guidelines, the silt would be removed at the project cost if it was needed for the bund or to be safely disposed, where silt could not be used for application in the agricultural fields. Farmers were expected to take silt to their field if it was suitable at their own cost; provision has been made only for excavation at the rate of Rs. 16 per cubic metre. The silt could be transported to the fields of small and marginal farmers if they are located within the radius of one km from the excavation.

The desiltation work was stated to be highly satisfactory in the case of 13.16 per cent and satisfactory in the case of about 29 per cent of the TMIs consulted because of the following reasons. In two or three cases, the community could remove more silt by charging the farmers for transportation of the silt to their lands on a tractor load basis. In some cases, the community had been able to create a silt bank to store the silt in the event that all of the silt removed was not taken by the farmers to apply to their fields. In general, it was ensured that the silt was either taken to the farmers’ fields or applied to the bund (rare) or deposited in the silt bank. There was no case where the silt was deposited in the foreshore area or any place in the close vicinity of the tank. In one of the tanks, the local contribution played a key role in removing silt much more than what the project provided in the budget. This discussion, thus, shows that when the community takes the initiative, this process of desiltation has been successful.
Table 8.4: Distribution of TMIs by perception on Desiltation

<table>
<thead>
<tr>
<th>Perception on silt removal works</th>
<th>Batch 2</th>
<th>Batch 3</th>
<th>Batch 5</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highly satisfactory</td>
<td>13.33</td>
<td>18.18</td>
<td>8.33</td>
<td>13.16</td>
</tr>
<tr>
<td>Satisfactory</td>
<td>26.67</td>
<td>27.27</td>
<td>33.33</td>
<td>28.95</td>
</tr>
<tr>
<td>Not satisfactory</td>
<td>40.00</td>
<td>54.55</td>
<td>50.00</td>
<td>47.37</td>
</tr>
<tr>
<td>Not undertaken</td>
<td>20.00</td>
<td>0.00</td>
<td>8.33</td>
<td>10.53</td>
</tr>
</tbody>
</table>

About 47 per cent of the representatives of TMIs stated that the desilting work was not satisfactory because of the following reasons.

1) The restriction that only less than 30 per cent of the estimated silt (by topo survey) would be removed for hydrological considerations was felt to be restrictive by the community in the case of these TMIs.

2) Except in a few cases, across the TMIs and districts, there was discontentment over the amount of silt that they had been able to lift. As mentioned earlier, in the plan prepared by the community, they had specified a certain quantum of silt to be removed under the project, but ultimately the amount that got sanctioned to them did not permit the removal of this amount. There were differences between the community estimate of silt and that arrived by topo survey.

3) The removal of silt was also affected in a few cases by the one year implementation cycle of the project – by the time the tank dried up and desiltation could be undertaken, the money would have left the community’s hands. Therefore, the process got further delayed.

4) A fair proportion of the silt removed was taken by the farmers and applied to their agricultural lands (Table 8.5). A key issue in this aspect was that in most of the cases, it was the better off farmers who had their own tractors or could afford to hire tractors, who had benefited the most from the removal of silt as they applied this to their agricultural lands. It had no impact on the landless households and even those with lands not in the command area or with very little land in the command area, because the latter two could not afford to transport the silt to their lands. The provision of providing silt to the small and marginal farmers within one km of radius could not be taken full advantage of as the fields of small and marginal farmers were often located far away from the tank and the complexity involved in obtaining small and marginal certificates. While the stipulation that farmers should lift the silt by themselves is good principle to encourage local contribution, the issue is whether which types of farmers have been able to make such contribution and the implications that this has for equity in terms of improving the agricultural fields of farmers in the command area and outside.

5) Table 8.5 shows that in about 40 per cent of the cases all the silt removed could not be used for the farmers’ fields. While non-suitability of silt for application to the agricultural fields has been the chief cause, inability on the part of the small and marginal farmers belonging to SC/ST categories to lift silt on their own was also an important contributing factor. This suggests that the project potential in terms of induced environmental impact could not be fully realized.
Table 8.5: Distribution of TMIs by proportion of silt applied to agricultural lands to total silt removed

<table>
<thead>
<tr>
<th>Proportion of silt applied to agricultural lands to total silt removed</th>
<th>Batch 2</th>
<th>Batch 3</th>
<th>Batch 5</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;=50%</td>
<td>18.18</td>
<td>30.00</td>
<td>9.09</td>
<td>18.75</td>
</tr>
<tr>
<td>50 – 75%</td>
<td>0.00</td>
<td>10.00</td>
<td>9.09</td>
<td>6.25</td>
</tr>
<tr>
<td>75 – 99%</td>
<td>9.09</td>
<td>20.00</td>
<td>9.09</td>
<td>12.50</td>
</tr>
<tr>
<td>100%</td>
<td>63.64</td>
<td>40.00</td>
<td>72.73</td>
<td>59.38</td>
</tr>
<tr>
<td>Not aware</td>
<td>9.09</td>
<td>0.00</td>
<td>0.00</td>
<td>3.13</td>
</tr>
</tbody>
</table>

6) Another problem in the tank bed was of weeds. Some TMIs said that not enough money was put aside for deweeding, which was potentially damaging to the tank in every way, especially something like ipomea plant.

**Tank Bund Interventions**

In most of the cases, when bund work had been taken up, it was done well – especially the construction of revetments, repair of sluices and bund strengthening. Table 8.6 shows the perceptions of the community on the quality of bunding works. Over 65 per cent of representatives of TMIs expressed high satisfaction and satisfaction with the bunding works. About 21 per cent of the representatives of TMIs have expressed dissatisfaction with the tank bund works.

Table 8.6: Distribution of TMIs by perception on bunding works

<table>
<thead>
<tr>
<th>Perception on bunding works</th>
<th>Batch 2</th>
<th>Batch 3</th>
<th>Batch 5</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highly satisfactory</td>
<td>40.00</td>
<td>36.36</td>
<td>8.33</td>
<td>28.95</td>
</tr>
<tr>
<td>Satisfactory</td>
<td>20.00</td>
<td>54.55</td>
<td>41.67</td>
<td>36.84</td>
</tr>
<tr>
<td>Not satisfactory</td>
<td>13.33</td>
<td>0.00</td>
<td>50.00</td>
<td>21.05</td>
</tr>
<tr>
<td>Not undertaken</td>
<td>26.67</td>
<td>9.09</td>
<td>0.00</td>
<td>13.16</td>
</tr>
</tbody>
</table>

The turfing of bunds was also a contentious issue. The TMIs said that wherever hemata seeds had been sowed, the grass had not come up well because it had got washed away by the rains, eaten up by goats and sheep, etc. They said that it was better to provide grass turf directly but that the project did not allow this since it was more expensive. JSYS officials were of the opinion that this reflects poor quality of bunding work. The community did not accept this, and noted that, the kind of care needed to grow hemata seeds was not possible with the budget provision made.

**Command Area Treatment**

Under command area development, we will cover construction of distribution channels, water distribution, crop demonstrations and pest management plans.

The command area has one or more main distribution channels taking water from the tank to the farmers’ fields. The lining of these channels has been one of the main tasks taken up under the command area treatment. Such work assumes importance because one of the main objectives of tank rehabilitation is to ensure that the all the command area farmers (including those at the tail-end) are able to get water to irrigate crops. The work relating to the construction of distribution channels was stated to be highly satisfactory in the case of over 21 per cent of TMIs. However, in most of the cases, the treatment of canals, though good, was said to be not so satisfactory since the sanctioned amount was insufficient to treat them all the way up to the farmer at the lowest end of the command (Table 8.7).
Table 8.7: Distribution of TMIs by perception on command area treatment

<table>
<thead>
<tr>
<th>Perception on command area treatment</th>
<th>Batch 2</th>
<th>Batch 3</th>
<th>Batch 5</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highly satisfactory</td>
<td>20.00</td>
<td>18.18</td>
<td>25.00</td>
<td>21.05</td>
</tr>
<tr>
<td>Satisfactory</td>
<td>33.33</td>
<td>36.36</td>
<td>25.00</td>
<td>31.58</td>
</tr>
<tr>
<td>Not satisfactory</td>
<td>46.67</td>
<td>18.18</td>
<td>41.67</td>
<td>36.84</td>
</tr>
<tr>
<td>Not undertaken</td>
<td>0.00</td>
<td>27.27</td>
<td>8.33</td>
<td>10.53</td>
</tr>
</tbody>
</table>

Another area where the communities expressed very good satisfaction was the distribution arrangement made after the project intervention. The objective of this is to attain higher efficiency of agricultural output by optimising the use of water from the tank. Table 8.8 shows that a large proportion of representatives of TMIs were happy with the water distribution. These TMIs were able to adopt water distribution from head to tail and back, and the free rider problem on account of borewell owners has been handled by the community in a significant proportion of the cases.

Table 8.8: Distribution of TMIs by status on water distribution

<table>
<thead>
<tr>
<th>Status on water distribution</th>
<th>Batch 2</th>
<th>Batch 3</th>
<th>Batch 5</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very good</td>
<td>53.33</td>
<td>54.55</td>
<td>25.00</td>
<td>44.74</td>
</tr>
<tr>
<td>Good</td>
<td>13.33</td>
<td>27.27</td>
<td>0.00</td>
<td>13.16</td>
</tr>
<tr>
<td>Not good</td>
<td>13.33</td>
<td>9.09</td>
<td>0.00</td>
<td>7.89</td>
</tr>
<tr>
<td>Not applicable</td>
<td>20.00</td>
<td>9.09</td>
<td>75.00</td>
<td>34.21</td>
</tr>
</tbody>
</table>

Other intervention in the command area was the crop demonstrations. For this, experts from the agricultural universities of Bangalore and Dharwad districts have been asked to give demonstrations on crops requiring less water. For this, Jalasri crop demonstrations were carried out on a large scale. Table 8.9 shows that demonstrations were carried out in the case of nearly 79 per cent of TMIs consulted. The adoption rate was not high in the case of exactly 50 per cent of TMIs. This was mainly due to non-filling of tank, non-release of water from the tank, etc. But, the community expressed satisfaction with Jalasri experimentation.

Table 8.9: Distribution of tanks by status on crop demonstrations

<table>
<thead>
<tr>
<th>Status on crop demonstration</th>
<th>Batch 2</th>
<th>Batch 3</th>
<th>Batch 5</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demonstration was carried out and widely adopted</td>
<td>26.67</td>
<td>27.27</td>
<td>33.33</td>
<td>28.95</td>
</tr>
<tr>
<td>Demonstration was carried out and not widely adopted</td>
<td>46.67</td>
<td>54.55</td>
<td>50.00</td>
<td>50.00</td>
</tr>
<tr>
<td>No demonstration</td>
<td>13.33</td>
<td>9.09</td>
<td>16.67</td>
<td>13.16</td>
</tr>
<tr>
<td>Not applicable</td>
<td>13.33</td>
<td>9.09</td>
<td>0.00</td>
<td>7.89</td>
</tr>
</tbody>
</table>

Since mono-cultivation has the potential to gradually reduce the quality of the soil and even degrade it, the project aims at experimenting with and promoting different cropping patterns. Arriving at cropping pattern suitable to the water available was also important to ensure water distribution up to the tail end, and ensure good yields and incomes to all the farmers. The consultations with the TMIs revealed that considerable training efforts took place with regard to the preparation of crop plans. Table 8.10 shows the crop pattern was substantially different that of pre-intervention phase in the case of over 34 per cent of TMIs consulted. In these cases, the TMI could convince the farmers on the need to have combination of crops in such a manner that everyone in the command area tends to gain.
In the case of about 29 per cent of the TMIs, the crop pattern was the same as before. This was found to be the case in the following instances. First, the soil within the command area does not allow diversified cropping pattern or flexibility in crop plan. Second, the presence of borewell owners and cultivators of horticultural crops within the command area was not conducive and came in the way of passing a resolution in the TMI. In other cases, although crop plans were arrived at, lack of filling in the tank prevented them to apply the same.

Crop plans were not prepared in the case of 36.84 per cent of TMIs, especially those belonging to fifth batch.

<table>
<thead>
<tr>
<th>Responses</th>
<th>Batch 2</th>
<th>Batch 3</th>
<th>Batch 5</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Substantially different from that of pre-intervention phase</td>
<td>26.67</td>
<td>45.45</td>
<td>33.33</td>
<td>34.21</td>
</tr>
<tr>
<td>Same as that of pre-intervention phase</td>
<td>53.33</td>
<td>18.18</td>
<td>8.33</td>
<td>28.95</td>
</tr>
<tr>
<td>Not prepared</td>
<td>20.00</td>
<td>36.36</td>
<td>58.33</td>
<td>36.84</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>11</td>
<td>12</td>
<td>38</td>
</tr>
</tbody>
</table>

8.7 Pest Management Plan
Integrated Pest Management (IPM) encourages the use of botanicals, pheromones, bio-control agents and microbial pesticides. Given the potential induced adverse impact of increasing pesticide use in the project area as a result of agricultural activities, a Pest Management Plan has been developed, which emphasizes the promotion of Integrated Pest Management activities in the project area. The promotion of IPM is to achieve the following outcomes:

- Improving farmer’s awareness of the health hazards of misuse and mishandling of Plant Protection Chemicals and the advantages of IPM.
- Improving awareness on usage, storage and disposal of PPC through training.
- Increasing awareness about efficacy and advantages of eco-friendly alternatives of chemical pesticides.
- Promoting use of bio-pesticides.
- Training and demonstrations related to the use of IPM techniques and practices.
- Dissemination of information about traditional practices used for the control of insect/pests.
- Integration of IPM into a package of practices for the area.
- Improving the information and knowledge base on pests, chemical pesticide use, health impacts, IPM use and trends across the regions.
- Development of promotional material, dissemination of IPM through field demonstrations
- Exposure of JSYS staff and others (field level functionaries, farmers and NGOs) engaged in the implementation of the project to IPM through integration of IPM in the training program.
- Initiating a rewarding and recognition system for an individual farmer or group of farmers for adopting IPM. Provide incentives to the farmers as well as traders for promoting use of bio-pesticides.
- Awareness raising on banned/hazardous pesticides to farmers, traders and the staff of agriculture and horticultural departments.
- Strengthening institutional capacity on IPM
**Issues Emerging from the Field**

As evident in Table 8.11, in the case of over 18 per cent of the TMIs consulted, the demonstration on pest management was carried out and it was widely adopted by the farmers. In the case of a majority of the tanks, demonstration was carried out but it was not widely adopted by the farmers for number of reasons. First, though the officials from agricultural department and/or universities provided the awareness on the merits in adopting Integrated Pest Management techniques and demerits in usage of Plant Protection Chemicals, not all farmers were forthwarming to adopt these techniques as they were not sure about the success rates of this demonstration. They did not want to take a chance with the crops, on which they depended for livelihood. Second, farmers have been following their own traditional practices for all these years. As a result, these farmers would simply brush aside any of the new techniques and would take sometime to adopt the new techniques. Third, the demonstration was just completed in the project area of a few tanks, wherein farmers were yet to undertake cultivation activities. Fourth, farmers’ experience was that the demonstration was more suitable for particular type of crops such as flowers, sunflower, etc., but not at all helpful in major crops like paddy. This has resulted in reluctance in adopting the technique, especially among those farmers who depended on paddy as a major crop for their livelihood. Fifth, as emerged from the brainstorming session at SPU level, the pest management demonstration did not fully take care of the change in the cropping pattern over the years.

<table>
<thead>
<tr>
<th>Demonstration</th>
<th>Batch 2</th>
<th>Batch 3</th>
<th>Batch 5</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demonstration was carried out and widely adopted</td>
<td>26.67</td>
<td>9.09</td>
<td>16.67</td>
<td>18.42</td>
</tr>
<tr>
<td>Demonstration was carried out not adopted widely</td>
<td>53.33</td>
<td>72.73</td>
<td>66.67</td>
<td>63.16</td>
</tr>
<tr>
<td>No demonstration</td>
<td>13.33</td>
<td>9.09</td>
<td>8.33</td>
<td>10.53</td>
</tr>
<tr>
<td>Not applicable</td>
<td>6.67</td>
<td>9.09</td>
<td>8.33</td>
<td>7.89</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>15</strong></td>
<td><strong>11</strong></td>
<td><strong>12</strong></td>
<td><strong>38</strong></td>
</tr>
</tbody>
</table>

To conclude, overall there has been decline in usage of PPC by the farmers, which is positive. In other words, the pest management demonstration has contributed to some extent in reducing the dependence level of farmers on PPC and move towards using the IPM.

**8.8 Water Quality**

*Current Status*

- Diversion channels were being provided to tanks to check the village sewage water entry into tank wherever it was noticed.
- Awareness of keeping tanks free from dumping of village wastes, composting heaps etc., has been done.
- Aforestation is being done in foreshore areas in order to improve the quality of water through checking of silt flow into tank and weeds infestation.
- Disposal of agro chemical bottles, bags etc., to the water body is reduced due to awareness building.
- There is a shift towards use of biological pest control measures.
- Wherever fisheries has been taken up there is a complete protection from contamination of water body.

*Issues*

- Less focus in awareness building programmes.
Focus is inadequate in the catchment area crop production practices especially on agrochemical use.

Weed infestation (like Ipomea, Bellary jali, etc) is still a common problem in most of the tanks.

8.9 Tribal Development Plan
Consultations with SC and ST members of the community were important in order to prepare a Tribal Development Plan, and leading members of the community were also invited to join such consultations so as to be sensitive to the perceptions of other sections of the community concerning the interests of the marginalised and vulnerable sections of the society. Through consultations including individual interviews, focused group (landless, women, SCs, STs, land holders, command area farmers, encroachers) discussions, and village level meetings, etc., a TDP was drawn up. The over all approach pursued is that the advocacy, training, etc. will be aimed at all the ST and SC communities at the individual tank levels. For the economic activities recommended here, group approach covering SC / ST families below poverty line will be pursued. The strategies for Tribal Development and Action Plan are as follows:

- Ensure adequate involvement and representation in TMI through necessary changes in the by laws.
- Organize tailor made training programs on leadership and community action
- Promote irrigation and improved dry land farm practices through tying up the existing programs of the government
- Ensure need based agriculture extension and support services; promote suitable cropping pattern and improved farm practices particularly dry land farming; assist in soil testing and treatment; support for market linkages
- Targeting the tank-villages and STs for institutional credit and supply of farm inputs
- Mandatory membership for tail end farmers among SCs and STs in TMI and adequate representation in TUC
- Ensure wage-earning opportunities during construction and maintenance work under the project on priority basis to STs and SCs and promote off-farm and non-farm occupations.

In the consultations with the TMIs, it was found that the total landless or poorest households were identified, and a list was prepared. There was also a fair representation of these groups in the organisations promoted at the tank level. These households were provided with project benefits such as involvement in civil works, where possible, foreshore plantation, turfing or plantation of hemata seeds, etc. In addition, loans were provided to them for undertaking income generating activities.

It was evident that all the groups had been giving loans to the SC/ST households. The activities initiated included purchase of sheep, etc., in addition to a range of non-farm activities. Table 8.12 shows the batch-wise distribution of TMIs by the proportion of the poorest households who had received loans through the project. It can be seen from the table that the coverage of the poorest identified during the planning process with the provision of loans has been impressive across the TMIs consulted. A large number of groups had also completed more than one loan cycle.
Table 8.12: Distribution of TMIs (per cent) by the proportion of poorest households who had got loan assistance for income generating activities

<table>
<thead>
<tr>
<th>Proportion of poorest households who had got loans through the project</th>
<th>Batch 2</th>
<th>Batch 3</th>
<th>Batch 5</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;= 25%</td>
<td>13.33</td>
<td>18.18</td>
<td>0.00</td>
<td>10.53</td>
</tr>
<tr>
<td>25 – 50%</td>
<td>20.00</td>
<td>18.18</td>
<td>8.33</td>
<td>15.79</td>
</tr>
<tr>
<td>50 – 75%</td>
<td>20.00</td>
<td>9.09</td>
<td>0.00</td>
<td>10.53</td>
</tr>
<tr>
<td>&gt; 75%</td>
<td>33.33</td>
<td>36.36</td>
<td>91.67</td>
<td>52.63</td>
</tr>
<tr>
<td>Not aware</td>
<td>13.33</td>
<td>18.18</td>
<td>0.00</td>
<td>10.53</td>
</tr>
</tbody>
</table>

The progress in this component has been, however, stated to be not satisfactory in the majority of the TMIs that the study team consulted. First, the scope to involve the tribal population in civil works has gradually declined due to use of machinery in these works. Second, the interest of the landless in tank affairs could not be sustained after the implementation phase due less attention for this. Third, the interventions of the project with respect to the development of the marginalised sections of society were, therefore, mostly restricted to the promotion of income generation activities among them. Fourth, in a few TMIs, there were problems of loan repayment by the beneficiaries. It was said that some of them even tended to be callous about the money they received from the TMIs because they did not consider it as the community’s resources but rather as money that has come from the government. They would therefore question the TMIs about the need to repay according to the schedule, etc. However, such cases were rare.

8.10 Gender Action Plan (GAP)

**Design of GAP**

The Project recognizes that women are marginalized from local decision-making due to socio-cultural factors, though they have the traditional wisdom on tanks. In order to increase the participation of women, who are the primary stakeholders of the project, and to mainstream gender concerns in the tank development program, the project intends to mainstream gender concerns at all stages of project i.e. planning, implementation and monitoring of the project.

The gender component has been included in the ITDP with the following objectives.

- To mainstream women’s concerns and involvement of women in all the activities of the Tank Management Institutions (TMI).
- To develop a plan for addressing women’s strategic and practical gender needs and incorporate it in the implementation of the ITDP.
- To build linkages of the TMI to local women’s SHG, line departments of the government and local authorities to access other tank related programs for women’s benefit.
- To ensure that the seed money allocated for addressing women’s concerns in the ITDP reaches economically vulnerable women members in the TMI and benefits them through constructive utilization of the money.

In order to look into gender related aspects in the ITDP, a Women Interest Group will be formed at the tank level. WIG is a sub-committee of TMI and will be headed by the woman who is the principal office bearer in the TUC, in order to articulate concern of women effectively in the TUC meetings. The following institutional arrangements have been made.
Women should be part of the preparation of ITDP.

Effective participation of women in TMI meetings and in all the decision process of ITDP.

In the activities of Tank Civil Works and Agriculture Related Activities women can participate and obtain benefits from ITDP implementation. In the Tank Civil Works, the priority should be given to women headed households who come under BPL, women from SC/ST, and other women labourers.

Women should be given the responsibility for repair and maintenance work.

Role of women and their involvement in the conflict resolution on matters relating to encroachments, generation of revenue for rehabilitation, O&M, which are to be settled through ITDP.

Micro-plan’s for women’s development: a) identification of various activities including IGA/SHGs – not merely women from command area landowning households, but also from other sections; b) women’s groups shall be viewed as partners in implementing the project than as beneficiaries - where possible such women’s groups shall undertake main responsibilities of TMI activities such as bund plantations, forestry/ nursery raising, seedling nursery, maintenance of washing spots, etc.

One woman from each household in the village to become a member of TMI.

It is mandatory to have at least one woman as the office bearers of the TUC (President, Secretary and Treasurer) and she will be one of the signatories on the cheque.

Ensuring at least 1/3rd of the Management Committee of the TMI be women.

Efforts should be made to appoint women officials for “technical posts”.

Economic empowerment of women through income generating activities and wage earning.

In order to facilitate employment generation for landless, vulnerable groups and women, it is decided to provide manual desiltation in the following ratio. Tanks having command area between 4 and 40 ha, maximum of 50 per cent of desiltation has to be done manually and remaining 50 per cent by machine. Whereas, the tanks having >40 ha as command area, maximum of 25% of silt be removed manually and remaining 75% by using machine.

Two member from each TMI will be provided training focusing on crop production in agricultural crops, horticultural crop, the concept of integrated water management, nutrient management, pest and disease management.

After the training on fishery activity such as fish rearing, harvesting and marketing, beneficiaries will be given fish fingerlings 1000 per ha. of water spread area boat/coracle, fishnets and screen, and a lease amount of Rs.100 per ha. water spread area.

**Evidence from the Field**

The project has a unique feature of mainstreaming gender concerns at all the stages of project. A positive aspect is that very inclusion of this feature in the project has made women to feel more empowered and not marginalized from the decision-making relating to tank rehabilitation. Some of the positive outcomes are as follows.

- Women were actively involved in the planning and implementation.

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2 Some of the Tank Civil Works, which women can take up are: a) de-weeding of tank bund and feeder canals, turfing of the embankment, curing of the cement consuming works such as masonry check dams, waste weir repairs and plastering; b) during off-season, planting of seedling and watering; c) preference will be given for women holding land to lift silt from the tank bed; d) women from vulnerable groups can take up fishing activity; e) catchment area – forestation, pasture development; f) tank bed – fishing, short duration crops; and g) tank bund – fodder cultivation, rights over tress, washing stone.
Women hold one-third position of the executive positions in TMIs. Ensured at least one woman office bearer in the TMI.

Each women beneficiary would have been provided between Rs.1,500 and Rs.2,000 from TMI for undertaking any IGA. One can say that only IGA component has become successful in a way, even though the amounts given to them were paltry.

Women interest groups have been formed.

Mobilization of women for any activities of the tanks was not at all a problem to TMI. They could be easily mobilized mainly because of their organized nature in the form of self-help groups.

A few loopholes in the implementation of the plan were found during our survey and the concerns were raised at the various meetings with different actors. The same is produced below.

While the project succeeded in the representation of women at various level of the project implementation, their active participation in the tank rehabilitation activities is yet to be substantially improved. They are not part of all the decisions made at the tank management level.

The involvement of women has been usually confined to planning or to SHGs.

Less or non-participation of women could be attributed to the limited understanding of the GAP either by TMI or CFT or women themselves. There is a need to understand GAP in larger perspective with adequate training and exposure.

In one of the villages, it was found that no equal wages were paid to both women and men for undertaking same type of work.

Active participation of women was only restricted to planning and tank civil works. Since TMIs and CFTs are not fully aware of the role of women in the post implementation phase or what difference their participation will make for the sustainability of interventions, the involvement of women interest groups during the post-implementation stage gets reduced.

TMIs think their job gets over towards gender mainstreaming once some amount is provided to few women for undertaking income-generating activities. When one asks what benefits did women obtain, invariably first response comes from TMI is “we have given them IGA loan?”

Women were not active in repair and maintenance work. This work was mostly controlled by the male members of TMI.

**8.11 Income Generating Activities**

The original project design envisaged Tribal Development Plan & Gender Action Plans to address the social concerns. Under both the plans some portion of funds was earmarked for tank based economic activities. The experience of initial three years has shown that as per the selection process the families identified under both the plans were overlapping and the funds earmarked under each of the above plans was found insufficient to initiate any viable activities. As mid course correction by merging economic assistance component of both plans a common income generation plan was incorporated into ITDPs. Eligible women members were assisted to initiate income generation activities. The allocation for ZP tanks and MI tanks was enhanced to Rs. 100,000 and Rs. 200,000, respectively. A maximum number of beneficiaries to be covered under each tank is also specified viz., 50 and 100 respectively for ZP and MI tanks. As per the information available the project has supported 1,283 tanks under IGA plans up to 6th batch. The coverage reached under this improved intervention has created significant impact on vulnerable families and contributed to their active participation in TMI activities.
The field interactions with TMIs have indicated that this programme is actually supplementing the family incomes even though the units are small and investment made the families is also small up to Rs. 2,000. A majority of the beneficiaries have taken up sheep and cow rearing activities and small percentage beneficiaries opting for non-farm tank based activities. Even though this programme has created the positive impressions, several field level operation issues have emerged in the interactions, which are summarized below.

1) As per the operation guidelines TMIs are expected to spend these funds through SHGs where the identified beneficiaries are members in such groups. In several cases it was found that many of the identified beneficiaries are not members of SHGs, who cannot be taken as new members in the existing group.
2) The amount earmarked at Rs. 2,000 per family is inadequate to take viable enterprises. Because of the earlier default of beneficiaries the mobilization of additional funds from the bank was also found to be difficult in several cases.
3) Though the project has indicated maximum number of beneficiaries per tank selection/ prioritisation of families for first round of assistance and this has posed a problem in some villages where the number of SHGs are more in number.
4) The skill improvement trainings were not focused much to improve the managerial skills and marketing aspects amongst assisted beneficiaries.

Keeping these issues in mind JSYS has to re-look into the operational modalities of this programme to make it more effective and viable.

8.12 Tank Safety Plan
The project covers mainly small existing dams (i.e. bunds of the tanks) most of which are very old with no major structural failure reported except of minor breaches in the embankments. The heights of the embankments for most of the tanks do not exceed 10 m and most of the tanks have a capacity less than 1.5 million cubic meters. The hydrology study has recommended a 25-year return period flood as an appropriate criterion for assessing tank structural safety. This appears reasonable considering that most of the tanks are very old with little information on their major failures.

The Department of Minor Irrigation (DMI) constituted a Task Force for structural assessment of the tank structures (dam and other appurtenant structures) needing rehabilitation. DMI also prepares pre and post health status reports of the tank structures. The project will follow design and construction standards with sound engineering practices and adequate quality control (through an independent agency). The Task Force’s purview will be extended to the tanks under the project and it will review selectively safety issues of tanks less than 10 m height but would consider all the tanks over 10 m height. The Task Force will co-opt specialist (hydrologist, geo-technical expert, construction expert) as considered essential for specific tanks for safety evaluation and suggesting mitigation measures. These aspects will be extended to the tanks under the project to ensure taking appropriate steps for health check ups of the tanks. The Task Force review would include on the spot inspection of the tank, recommend specific surveys if required and suggest remedial measures which would be carried out by TMIs with the support of CFTs and JSYS.

Issues Relating to Tank Safety
The quality of bunds has been perceived to be good by most of the TMIs. However, the downstream stabilization of bunds has become a contentious issue along the lines of turfing vs. hemata seeds. At different level, the reluctance on the part of the community to go for hemata seeds or failure in its attempts to succeed in the plantation of hemata seeds has been
interpreted as reflection of poor quality of bunds. In our view, this may not be the case since
the growth of hemata seeds needs focused attention from the community for 2-3 years. The
community may be given an option to go either for conventional turfing methods or hemata
seeds. The budget provision should be however for conventional turfing method.

8.13 Protection of Cultural Heritage
Tanks have played a pivotal role in the culture of a community. These cultural aspects can be
classified into three; community-oriented, caste oriented, and individual oriented. It has been
noticed that most of the tanks generally have traditional festivals that bring the entire village
together. The general feeling of the communities is that this project will contribute to the
enriching of the traditional cultural practices surrounding the tank system. A detailed study
on 18 tanks including potential impacts on cultural property was conducted by JSYS. In this
study, the cultural, religious, and traditional role of tanks was classified in three grades. In
approximately 20% of the tanks the community played significant role in worshipping deities
relating to the tank and tank water. However, only in four tanks were shrines/places of
worships found on tank bunds.

As per the design, the project will not finance any project interventions that have a negative
permanent impact on cultural property. The project interventions (desiltation and
strengthening of embankments) may however have a temporary negative impact on cultural
and ritualistic activities. The project may temporarily affect small shrines or places of
worship – especially if these are located on the tank bund. The mitigation measures proposed
would avoid other potentially adverse affects on cultural property. For example, desiltation
would be carried out in such a manner as to avoid burial grounds. Likewise, modifications to
the waste weir would avoid affecting temples situated in close proximity to the waste weir.

The institutional arrangements to ensure satisfactory implementation of the Action Plan rests
with the TMI with assistance provided by the Cluster Facilitation Teams. During the
preparation of the ITDP, identification of all potentially affected cultural property in the tank
system will be made. Appropriate changes to the physical interventions will then be
considered to avoid negative impacts to cultural property. If certain minor, temporary affects
are unavoidable, adequate mitigation measures will be developed by the TMI. JSYS will
provide assistance at the district and state levels with responsibility for cultural property
assumed by the Resettlement and Tribal Development specialists.

It was learnt in the consultations with the TMIs that the community has continued to perform
all the ceremonies and festivals associated with the tank. Secondly, where historical
structures were present either in the form of sluice or on the tank bund, they were protected or
renovated after the completion of works.
9. ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK

9.1 Introduction
Having outlined the social and environmental issues in the last chapter, let us now proceed to list the suggestions towards improving the social and environmental framework. It needs to be mentioned that a number of suggestions emerged from the consultations held at the SPU, DPU, CFT and TMI levels. In listing the suggestions towards modifications and improvements in the existing social and environmental framework, we have been guided by the issues that have emerged from the field, harmony between components, costs, local participation, etc.

9.2 Adequacy of the Existing Social and Environmental Management Framework
The original project has a well defined social and environmental management framework to address social and environmental issues emerging during project implementation. This was designed on the basis of comprehensive Environmental and Social Assessment (ESA) studies conducted as part of project preparation followed by a series of consultations held with various stakeholders. The framework had the following well-defined mitigation / enhancement action plans.

- Resettlement action plan (RAP)
  - Indigenous people’s development plan which was subsequently called the Tribal Development Plan (TDP) as per the project requirements.
- Environment Management Plan (EMP)
- Pest Management Plan (PMP)
- Gender Action Plan (GAP)
- Tank Safety Plan
- Protection of cultural heritage

The review of experience gained during the project implementation indicates that the environmental and social management concerns have been effectively mainstreamed into the project implementation. The project has developed process guidelines and PRA modules/methods for all four phases of the ITDP cycle wherein the environmental and social processes are well built into the process cycle. The TMI bylaws and organizational structure also provide for adequate representation to vulnerable sections, women etc., apart from describing social and environmental related functions and responsibilities of TMIs and various committees within them. It can be, therefore, stated that the existing environmental and social framework has been by and large adequate.

Nevertheless, the implementation level issues described in the previous chapter on these issues need improvements and institutional mechanisms for stricter compliance. These improvements are listed below.

9.3 Social and Environmental Management Framework

Screening Framework for Selection of Tanks
The ongoing project has a broad framework covering social, economic, environmental and hydrological parameters for the selection of individual tanks. However, in the operationalisation, the selection of individual tanks has largely been made by using social and hydrological indicators. There is need to further improve the screening criteria with specific
indicators in a simple format for the use of field level teams. This checklist shall indicate social, economic, environmental and hydrological parameters so that the field level selection process would be simple and unambiguous.

The experience indicates that several needy tanks were not selected on the frequent surplusing criterion (hydrological) due to deviation of feeder channels in the upper catchments. The project also has a few success stories where the water inflows have substantially increased with minor interventions in the upper catchment areas.

Based on this, it can be suggested that there is need for improving the hydrological parameter for tank selection by introducing rankings on the basis of extent of surplus. The first priority could be given for frequently surplusing tanks and next priority for various storage levels ranging from 25% to 99% occurred in the past 25 years.

In order to ascertain and understand the issues relating to catchment, hydrology and environmental issues, pre-selection rapid assessment needs to be made before commencing the pre planning activities. Such a pre-selection feasibility assessment is to undertaken by a multidisciplinary team and should be institutionalised into the ITDP cycle process activities.

Similarly the assessment of the community’s willingness has to be made not only by considering the willingness of the community to contribute to the project cost but also on the basis of the commitment of command and catchment farmers to abide by the operational management systems evolved in the TMIs. These stakeholder consultations need to be inbuilt as essential processes in the pre selection assessment.

**Consultation and Participation Strategies**

The ongoing project has incorporated very good plans and procedures to improve the quality of consultations to ensure maximum participation in the case of the following critical stages. First, pre planning phase consultations with individual stakeholder groups before forming the TMIs are necessary especially during identification of stakeholders. Second, even in the planning stage, before PRA and after PRA, consultations with command area farmers, catchment area farmers and vulnerable families need to be done in a systematic and effective manner. Third, during implementation, frequent interactions other than the Gram Sabha discussions would result in higher participation and ownership amongst all members of TMIs. However, the key issue is the seriousness with which these have been carried. Hence, we suggest the following.

1. A pre appraisal review at the DPU level of all draft ITDPs to ensure adherence to all social, environmental, gender and technical parameters of the project. This is to be done by a multi-disciplinary team of experienced specialists at the DPU level including the required number of external experts. This is to be linked with the final approval by district committee.
2. Before release of funds, assessment of TMI preparedness to commence implementation phase is needed.
3. During the implementation, a mid term assessment/audit of environmental, social and gender aspects is also suggested to ensure that all parameters are addressed throughout the project cycle and all components are given equal focus during implementation. This should be linked to the release of second or third instalment to TMI.
4. At the beginning of the post-implementation phase, a PRA of shorter duration could be considered to enable TMIs to review the performance of ITDPs and also prepare a long term plan of management and further improvements. This should also be linked with the release of funds.

The project cycle duration needs to be designed in a flexible manner to ensure the following. First, a longer duration is to be provided for pre-planning and planning for large tanks having command area in several villages. Second, at least two working seasons need to be provided for TMIs to address all implementation interventions in a qualitative manner with sufficient time for sustainability and institution building processes. This will also ensure sufficient time for the facilitation teams to carry out the processes in qualitative manner.

Operational procedures and guidelines need to be made flexible which is essential for the community based approach. Adherence to process quality in the institutional aspects would ensure optimum transparency and accountability and JSYS should look into this aspect to simplify operational procedures.

**Resettlement and Rehabilitation**

The revenue survey is essential to identify the encroached areas. Currently, such surveys are organized with the coordination of the Revenue Department. The department surveyors and also the private surveyors licensed by the department are currently being utilized for survey and certification of encroached lands and families. Due to paucity of personnel available in some taluks, it was reported that there is time lost in organizing surveys. There needs to be some mechanism worked out to take up this important implementation issue with the Revenue Department.

The quality of socio-economic assessments carried out in the case of encroached families needs to be improved.

The awareness levels among Project Affected Families (PAFs) and Tank User Committees (TUCs) especially on institutional aspects such as grievance redressal committee, district project units (DPU) and, more importantly, on all the entitlements should be improved. This problem is owing to the frequent turnover of staff at CFT and DPU levels, and lack of frequent orientation and training. Hence, the implementation agency has to strengthen the training and communication component.

It is also pointed out by the impact assessment study that in few individual cases, compensation at replacement value has not been extended to the lost assets as per the policy, which needs to be streamlined by the implementing agency.

If the encroacher was growing fruit bearing trees on the tank property, instead of removing such well grown trees with economic value, some sharing mechanism could be developed between the families and TMIs to share the benefits in a mutually agreed upon and appropriate manner. This would ensure that the ownership rights of the trees are vested with TMIs and a part of the income would flow back to the families with the precondition that they should shoulder the maintenance of trees. In the consultations, there was consensus among the TMIs for this kind of a measure which would also minimize the cost burden on the project since compensating orchards and large scale plantations would be expensive. An added advantage would be the accruing of additional income to the TMIs for the operations and maintenance (O&M).
The provision of additional ration for three years through the Public Distribution System (PDS) as provided in the R&R policy is found to be unessential. This is owing to the fact that the PDS is already well established by the government with adequate supply of food grains. Besides, for a majority of the affected families, income from the encroached upon land is not the main source of livelihood for subsistence. These families typically grow only one rain-fed crop during the Kharif season while agriculture labour and other occupations constitute their main occupations. Hence, this provision could be considered for implementation only in the deserving cases after proper assessment.

Establishing bank linkages to mobilize additional investment costs for the families to take up bigger economic ventures is to be encouraged. The subsidy schemes of government owned corporations for vulnerable families could be one potential source which could be tapped with better coordination at the district and taluk levels.

As per the original staffing pattern, adequate number of designated specialists have be placed at the CFT and DPU levels with regular focus on capacity building.

**Gender Strategy**

The participation of women needs to be deepened by focussing on the following.

- Including facilities such as washing stones which are essential for women in civil works component as was done in the first two batches.
- Assigning a larger number of civil works to women SHGs for execution.
- Target women headed households on a priority basis in all the agriculture related programmes
- Encourage employment generation among women wherever manual works are involved
- Entrust the management of plantations and such eco-development activities to women SHGs
- Empower women interest groups to play a key role in all social development related activities including income generation activities
- Increase the exposure/experiential learning aspects in the capacity building component and revamp it to give equal focus to men and women members
- Empower or activate sub-committees/supervisory committees of TMIs to ensure transparent decision making and better participation

The preplanning phase assessment and grading of TMIs should be made effective to ensure adequate gender representation in the institutionalisation process. In addition to this, a few more audit mechanisms are required before appraisal of ITDPs at the end of planning phase and in the middle of the implementation phase. In addition to these two mechanisms, the post implementation phase assessment and grading has to be done in a more systematic manner. It is advisable to create some efficient teams to carry out these assessments instead of leaving the tasks to the CFT and DPU specialists who are burdened with other tasks.

Overall, the currently existing gender strategy and framework along with the above mentioned new mechanisms has to be implemented effectively without compromising the process quality to achieve gender mainstreaming in the overall tank management.
**Income Generating Activities**

Based on the issues discussed in the earlier chapter on the framework of IGA programmes for vulnerable groups, JSYS has to make several improvements in a) the approach for this programme, b) criteria for fixing the targets c) the funds earmarked d) measures to access additional finances e) training and capacity building f) market linkages. Some of the areas of improvement are summarised below:

1) Though JSYS issued guidelines through circulars on this component, the field interactions with TMIs and CFTs shows that, there are so many ambiguities and confusions in implementing this programme. So JSYS shall develop a detailed manual of operational guidelines defining the step-by-step approach to be followed.

2) As far as possible identify the activities which could be undertaken on group approach to ensure economic viability of the activity.

3) This fund should be implemented through SHGs and wherever the beneficiaries are not members the project could consider forming new SHGs from the preplanning phase itself.

4) The unit size should be given attention while planning to ensure viability of the activity.

5) For categorisation of vulnerability and selection of beneficiaries, the priority in descending order is to be given to woman from landless SC/ST, landless families, marginal farmers and small farmers.

6) Keeping the constraints of accessing the bank funds, minimize the number of families per tank or increase the allocation of funds earmarked for each tank. Even fixing of ceiling per tank irrespective of the population also needs re-look. It would be ideal if the investments are linked to the population or to the number of SHGs.

7) Wherever the vulnerable families have landholdings adjacent to the tank areas, the land based activities needs to be promoted for which several government supported programmes are available, which could be tapped.

8) The training, skill building and marketing linkages for better prices have to be made more effective to sustain the investments in the long run.

Overall sustaining the participation of vulnerable people in the TMIs needs a systematic approach for this programme.

**Catchment Area Management**

The interventions up to the 5th batch were taken up within the distance of 500 meters from the tank boundary. The marginal extension of treatment area up to 1000 meters as a mid course correction has been applied in the 6th batch of tanks. Going by the available indications, this has created a positive impact at the community level. In addition to this, the concerns regarding catchment area treatment as discussed in the last chapter need to be addressed in the subsequent tanks. These are listed below.

- Catchment area treatment should be as per the need. Some important interventions such as deviation of the course of feeder canals have to be designed carefully to restore the inflows into the tank and also remove encroachment of feeder channels. This can be achieved by streamlining the preplanning and planning level assessments. In addition to physical structures provided to feeder channels, there is need for building low cost vegetative barriers across all feeder channels in required numbers which would effectively reduce the silt flow. Important plant species to be promoted and planted on vegetative barriers and along the feeder channels in a systematic manner are bamboo, agave, soil binding grass varieties, pongamia, cassia, etc.
• Priority needs to be given for cultivable land and common lands in the catchment. Awareness building on soil erosion and environmental aspects amongst catchment farmers needs attention since protection of these lands is as important if not more than the treatment of feeder channels. Exclusive training and capacity building activities could be evolved as part of the agriculture component especially on issues such as importance of soil protection, improved agricultural practices, water management practices (for borewell owners), dry land horticulture etc.

• Apart from awareness building, there is a need for encouraging horticulture in association with horticulture department. Linkages with the watershed development department for intensive treatment of catchment area also need to be established.

• To arrest silt flow into the tank bed, it would be ideal to focus on various activities like silt traps, a trench all along the boundary of the tanks as a lower reach watershed treatment. In addition, planting all along the border trench in a scientific manner could be planned and implemented in a participatory manner.

• The foreshore area needs to be intensively treated with afforestation with various multipurpose plant species. In addition, common lands available adjacent to the tank need to be treated with plantations which would minimize the silt flow into the tank bed.

• In the existing project design the plantation activity is planned as part of tank improvement civil works which is mainly monitored by engineering personnel without adequate knowledge on the importance of biological methods involved in catchment area treatment. This being a seasonal activity, the community should have more flexibility in its implementation. It was observed in the interactions that in many tanks the funds have been withdrawn after expiry of 12 months without completion of this particular activity due to seasonal interferences. Moreover, a part of the afforestation fund is meant for maintenance costs which need to be spent over a period of two years. In several cases these costs have been withdrawn as unspent components of civil works. With this experience it is suggested that all biological treatment activities including afforestation should be included as a part of the EMP component, to be effectively monitored by the agriculture/environment specialist.

• The review of experiences on implementation arrangements for plantation programmes throws light on the following lessons on planning and inputs for this programme. The types of plant species identified by the communities were not available in the forest department nurseries. This has forced the TMIs to plant whatever species are available in the nurseries. Though the project has promoted quite number of nurseries through women SHGs, the age and size of the saplings is often not sufficient to establish the plantations with successful survival rate owing to the fact that it is very difficult to sustain tender plants. During interactions women expressed that it was not a remunerative activity and moreover the gap between the supply and demand was huge. So this situation allows the project to mainly source the plants in required numbers and also required species from the forest department nurseries. TMIs should also ensure
that with advance arrangements with the forest department, only seedlings of more than two years age should be planted since these have higher survival rates. For maintenance and grazing control, TMIs have to be facilitated to evolve and adopt social fencing by assigning these tasks to vulnerable families and SHGs. This is done by a large majority of TMIs currently. It is also essential to equip TMIs with basic implements to manage critical watering during the summer. These implements would include small water drums which can be carried, bullock carts and pipes etc.

**Effective Utilization of Silt and Proper Disposal**

Desiltation is an important component and the proper disposal of silt thus assumes much importance from environmental perspective. This is mainly keeping in view the need dispose it away from the tank beds and to avoid further deposition of silt in the channels and water bodies. To a certain extent, this was addressed in the ITDPs. However, based on the implementation issues/deviations discussed earlier, the following measures which are part of the original design of the project need to be ensured in the field implementation.

- The silt disposal plans in the ITDPs need to be done on the basis of proper mapping of safe dumping sites away from the tank beds. The cost of transporting has to be inbuilt to avoid implementation level practical problems encountered by TMIs. Practices such as creation of silt banks in the periphery of tank beds as cost cutting measures need to be dispensed with. The implementation guidelines and circulars on this issue need to be reviewed to ensure adherence to agreed environmental safeguard plans.

- The experience of five batches of tanks indicates that the cost of transportation was transferred to the farmers and the project provided only the excavation costs. The experience across TMIs as emerged in the interactions revealed that the farmers who own tractors and have easy access to finances have utilized this opportunity to a very large extent. The lack of a detailed database on this issue at the project level has provided little scope for further analysis. A large number of small and marginal farmers, Scheduled Tribes and Scheduled Caste farmers especially in the rain fed catchment areas could not access this opportunity to improve their soil productivity owing to their poor socio-economic conditions. Their discontentment was clearly evident from the field visits and TMI interactions. There is need for the project to address these concerns to adhere to the provisions of the social safeguard plans. The situation also necessitates meaningful and collective internal discussions before taking crucial operational policy decisions at the apex level. It is pertinent to highlight that every operational policy decision would have a direct bearing on the sustained participation of stakeholders in the TMIs and also institutional sustainability.

- That silt is an important input for improving soil fertility and physical status of degraded rain fed soils is adequately established by the abundant indigenous experience of farmers and also soil testing carried out by the project. Hence, silt disposal has to be seen in the right perspective. By considering the positive impact created in improving agricultural production as documented by the project, large areas of agricultural lands could be treated with this important input. This would be a significant contribution to improving environment qualities like improving in soil biota. It is also suggested that the increased agriculture production from silt application should be taken into consideration while determining the overall
economic rate of returns from silt. The project requires greater sensitization of personnel on these social and environmental aspects and in establishing effective coordination amongst different components which were hitherto functioning as stand alone components.

- The soil testing currently being conducted in the command area has to be expanded to the catchment area as well to enable those farmers to take timely decisions on manure and soil management.

- To ensure soil stabilization, the project has switched over from the conventional method of using grass turf readily available in the tank areas to turfing of downstream slopes of tank bunds with *Stylo hemata* seeds. This was mainly to reduce costs and also to tap the greater fodder yielding potential of *S. hemata*. In the interactions, it emerged that it is a difficult process for TMIs to use and maintain the turf from these seeds as it requires more focussed maintenance such as watering, re-sowing etc. By and large, a majority of the TMIs favoured conventional grass turf for its soil binding potential and easy management. It is thus advisable for the project to go in for established indigenous methods which are manageable by the communities and it is also useful for the project to test any new method in couple of tanks before wider adoption.

**Promotion of Eco-friendly Agricultural Practices**

The experience of the past five years has clearly established the importance of eco-friendly agriculture practices such as use of natural manures, integrated nutrition management methods (INM), biological pest management, cultural practices etc. The demonstrations carried out in the tank commands have made farmers continue these practices even after the project. It is important for the project to spread these lessons to wider areas, across all command areas and even to farmers who have lands outside the command area. The project needs to immediately focus on strengthening the institutional capacity at CFT and DPU levels for successful diffusion of such eco-friendly practices.

Water management demonstrations have successfully proved that the improved irrigation methods would result in water saving and also water use efficiency (WUE). The project needs to focus on mainstreaming such practices from demonstration farmers to all command area and other farmers in the village with borewells. Quite a number of borewell irrigated gardens were observed in the catchment areas and project needs to sensitise such farmers towards switching over to water conservation technologies such as drip irrigation, improved irrigation methods to reduce extraction ground water in the tank peripheries.

The project in collaboration with the agricultural department and agricultural universities has successfully demonstrated the importance of organic farming to select farmers. It is important for the project to spread these lessons to wider areas to cover more number of farmers under organic farming. Efficient coordination with departments, frequent interactive workshops with successful organic farmers, exposure visits, exhibitions, linkages with organic stores and agencies of certification, effective development and dissemination of communication material etc., are some of the important measures for the project to focus on.
Management of Problematic Soils
The review of experiences and interactions has shown that this is not a significant problem in the project areas and this is expected not to be a major issue in the proposed taluks either since almost all tanks are seasonal in nature thereby ruling out the scope for perennial water logging, salinity/sodicity etc. However it is suggested that clearing of closed excess water drainage in the command areas wherever applicable as part of ITDPs and awareness building of farmers as part of agriculture capacity building on the management of soils need to be given attention by the project especially in taluks which have predominantly black cotton soil.

Water Distribution Management and Conservation
The canal system in the command areas is partially provided with lining to minimize conveyance losses. The project shall look into the possibility of extending this provision to cover the maximum length of the canal to ensure availability of water at tail ends and also reduce the loss of water. Wherever suitable the pilots shall explore the possibilities of experimenting with bio-lining approaches which are cost effective. An equally important issue is the maintenance of main irrigation canals and field channels in the command areas. This important activity is one of the operation and maintenance functions of TMIs. During interactions and field visits, it was found that several TMIs have re-established/ are continuing with the customary practice of collectively cleaning the canals before letting out water from the sluices once in a year. It is advisable and important to strengthen this system in the TMIs with appropriate capacity building to increase the frequency of canal cleaning to at least two times in a crop season. The TMIs should give the responsibility of regular canal upkeep along the side of the field channels to individual farmers.

The customary practice of Neeruganti (Waterman) managing water distribution has been re-established by most TMIs as revealed in the interactions. Neeruganti is vested with the responsibilities of operation of sluices, continuous monitoring of irrigation canals, distribution of water to the fields as decided by TMIs. He is paid in kind in the form of food grains at the end of the crop season by farmers for the services rendered by him. Several TMIs have revealed that watering/distribution is being done from tail end areas to head reaches to ensure irrigation to tail end areas. There is a need for the project to streamline and propagate such best practices to all the command areas in an efficient manner. Some exclusive training and exposures are also suggested for Neerugantis to sensitise them on issues such as the importance of maintenance of canal network, better irrigation methods, operations and maintenance of tank systems.

The creation of adequate dead storage and its management needs careful attention from the project. The objective of this initiative shall address the multiple advantages such as a) availability of water body for longer period for fisheries, b) sustaining the live stock and domestic needs in summer season, c) enabling more ground water recharge, d) ensuring water availability for plantations etc. TMIs need to be sensitised on proper maintenance of dead storage from contamination, unauthorised pumping etc.

During field visits and interactions it was found that there are traditional common wells or Kalyanis existing in the peripheries of tank beds or in command areas. Traditionally these water conservation structures have provided irrigation and met water needs in the critical stages when the tank storage exceeds the bund. These structures have played a significant role in practising conjunctive water use. Currently, all such structures are either encroached upon or filled with silt. With very small investments, these water conservation structures
could be restored by removing the silt. After restoration these structures would contribute significantly in conjunctive water use promotion and also in extending protective irrigation to the adjacent cultivable lands owned by marginal and SC/ST farmers. The project could consider restoration of such small structures wherever it was identified in the PRA as an innovative activity in the agriculture/environment promotion component.

**Pest Management Plan/Sustainable Agro-Chemical Management**

As discussed in the previous chapters the promotion of IPM methods with increased focus on biological methods of pest control is a crucial area of the project which needs further fillip. The experience has shown good success stories. Experiences at the individual farmer level and demonstration plots need to be further strengthened by appropriate focus on the diffusion mechanism at various levels. Some of the priority areas for improvement are as follows:

- Strengthen institutional capacity at the CFTs and DPUs by positioning adequate number of personnel. The training and capacity building of personnel at all levels needs to be focussed on a continuous basis for increasing the knowledge and skill sets.
- Coordinated planning with other departments from district to tank levels to maximise the impact is another important area of concern. The departments of agriculture and horticulture have similar kinds of schemes and policies and a consortium approach is necessary for opinion building of farmers effectively.
- Adequate focus on awareness generation by organizing exposures visits, workshops etc., at different levels needs to be focussed on for all the tanks. To make this effective, suitable IEC material has to be produced and propagated.
- The experience indicates that propagation and adoption of biological methods of pest management has to be made by considering the village as a unit instead of focusing only on command area agriculture. This is important in view of the fact that a large number of vegetables and horticulture crops are grown even outside the command areas.
- Empower TMIs to have regular discussions in the agriculture seasons
- Document success stories and produce suitable IEC material focusing on farmers, TMIs and PRIs.
- Increased intra-taluk and intra-district exposures of farmers need to be organised to sustain the farmers’ motivation.
- Sensitization of pesticide dealers to ensure that they provide knowledge to farmers on safe use, use of recommended dosage, recommended pesticide, etc.
- Wide knowledge building on the biological alternatives available for specific crops with adequate information base available at various local level institutions could be considered by the project

Wider propagation of organic farming which includes frequent experience sharing workshops with successful organic farmers, linkage with organisations working for promotion of organic farming, building market linkages for organically produced fruits, vegetables and food grains would strengthen these efforts. This needs to be addressed as part of implementation strategy in a comprehensive manner.

**Water Quality Management**

As discussed in the previous chapter adequate measures have been taken by the project to address contamination issues in the tank water. Though these tanks are generally not used for drinking water purposes, efforts made so far to clear the compost pits has been focussed on
avoiding contamination. This is important in view of the location of drinking water borewells in the tank beds in few villages, dependence of livestock on tank water body and fisheries introduced in many of the tanks.

The project could focus on a) awareness generation b) addressing these issues in ITDPs c) sensitisation of catchment area farmers on chemical and pesticide use d) tackling of weed infestation in the tank beds e) deviation of domestic sewage wherever it is found etc.

**Marketing Strategy for Environmental Products**

The project has made considerable progress in terms of promoting vermicomposting, bio-pesticides, organic production at individual farmers and SHG levels. To strengthen the market linkages with the SHGs and TMIs, further focus needs to be given to having association with the line department like APMC, HOPCOMS and terminal markets. The project should evolve a clear marketing strategy to address not only the environmental products but the overall agriculture marketing aspects. Cluster level workshops for TMI members need to be organized frequently to create awareness on marketing strategies like proper grading, packing, distribution, brand building etc., which would help the farming community to market their products at remunerative prices and minimize middlemen involvement.

**Tank Safety**

The project should make efforts to strengthen the mechanism for quality assurance during the renovation of any size of tank bunds. The existing mechanism for tank safety monitoring may be continued to address any future needs.

**Cultural Heritage Framework**

The review of experience and interactions has revealed that this is not a significant problem in a majority of the tanks. Small temples located on tank bunds were reconstructed by the TMIs wherever tank bund strengthening works have been implemented. In a few isolated cases the replacement of old sluice structures which have heritage value were reported. The project could continue the existing framework with more sensitization of engineers and social specialists on the importance of protecting any structure which is culturally significant.

**9.4 HRD and Capacity Building Strategy**

The project has a HRD strategy with two important components viz., institutional building and capacity building. The review of performance of this component shows there is declined focus on consultation and participation from the third year onwards due to staff turnover and the pressure of meeting higher physical targets. The institutional capacity at SPU and DPU levels needs strengthening as well. The capacity building component being crucial and as the foundation to attain the project objectives, needs primary attention of JSYS and the following crucial improvements are required -

- The project has designed training modules for TMIs to be carried out in all the four phases of ITDP cycle. Since these modules were designed in the initial years, they need review for refinement.
- Capacity building needs assessment has to be carried out to assess the needs at the TMI, CFT, DPU & SPU levels. The M&L reports have thrown sufficient light on improving the quality and on some areas of important training needs. The project needs to carry out a comprehensive assessment. It would be advisable to utilize the
services of an outside training agency for this task instead of JSYS internally doing the assessment.

- Increase the number personnel at different levels and have dedicated personnel at all levels to handle this task in a focussed manner.
- The focus so far is only on administration of structural training modules and very limited attention has been given to exposure visits, intra-TMI interactions, etc. These aspects have to be given immediate priority by the project.
- The training component at the TMI level is currently handled by CFTs on ad-hoc arrangement between JSYS and NGOs. This aspect needs to be institutionalised into the CFT contracts for more accountability and efficiency.
- In view of the frequent turnover of staff, it is essential to conduct frequent vision building and training of trainers (TOT) programmes to ensure continued focus on the capacity building activities.
- JSYS needs a proactive HRD policy to address issues of staff turnover, non-availability of experienced staff etc. The selection and recruitment policy developed in the initial years should be followed to ensure that only experienced and capable specialists are recruited for all the areas of intervention.

**Communication Strategy**

The communication strategy of the project comprises of two components namely behavioural change and information. The project has developed effective training films, manuals and posters. However effective utilization of the material developed has not been ensured due to lack of adequate manpower and the over all declined focus on capacity building. In addition to the suggestions made above on capacity building, JSYS has to focus on the following critical areas:

1. Evolve a communication strategy defining the feature road map.
2. Set up a resource group of experts at the state level to provide expertise to SPU MA&D unit to implement the strategy effectively.
3. Organise a quick needs assessment of communication needs at all levels.
4. Equip the implementation units with the required manpower.
5. Based on the assessment develop IEC materials and initiate dissemination.
6. A large number of success stories were reported from the project districts and JSYS should make efforts to document these stories and disseminate them to TMIs across the state.

**9.5 Monitoring Strategy**

The monitoring framework and indicators outlined in the design have been found to be adequate. However, improvement is needed in fulfilment of responsibility, methodology adopted and use of the monitoring results.

As far as the performance tracking is concerned, the responsibility has been assigned to TMIs, CFTs, DPU and SPU. In order to ensure that these different actors fulfil their responsibility, the following are needed. First, preparation of annual action plans to consolidate year-wise inputs to be provided, and expected project outputs and outcomes. This will enable the different units within JSYS to periodically monitor the performance. For this, strengthening of M&L units at SPU and DPU levels (see more on this in the next section) is essential. Second, similar annual action plans are to be prepared at CFT level to facilitate the performance tracking. Third, baseline data collected by CFTs for each tank
needs to be converted into simple monitoring tools at the TMI level and the performance of TMI in monitoring is to constantly monitored by project personnel.

Institutional tracking is to be undertaken by TMI and JSYS once in a year. The self-assessment exercise can be facilitated at the TMI level with simple PRA tools such as cobweb diagram. At JSYS level, annual retreat is recommended with facilitation by external consultant having expertise in this area.

Evaluation of project impact and outcomes is to be undertaken before and after the project, and development audit once in six months. In the terms of reference given to the external agency for monitoring, adequate safeguards are to be included regarding adherence of timeline, quality of monitoring (participation, transparency and accountability) and utility of monitoring results.

9.6 Institutional Arrangements

*Decentralised decision making*

The decisions relating ITDP approval have been devolved to DPUs. At the moment, if the ITDP cost is less than Rs. 50,000 per hectare in the case of ZP tanks and Rs. 30,000 per hectare in the case of MI tanks, DPUs can process the ITDPs. If the cost is over these caps, ITDPs will have to be referred to SPU. In the field, considerable confusion prevails regarding this, with some TMI's being very upset with the delay in the process of applications at SPU level. This needs to be addressed through effective communication strategy and addressing the factors contributing to delay. We could also suggest DPU can take the decision relating to ITDPs with costs higher than those specified at the moment in some form of speedy consultation with SPU.

If TMIs suggest re-allocation of budgets among different heads and they have valid reason for doing so, DPUs may be given decision making powers within specified limits.

A concern that emerged during the consultations was that the mechanism relating to finding the shortage of staff and taking speedy decisions relating to appointments did not, at times, work the way the project priorities liked it to work. Hence, this aspect needs to be given serious thought.

*Provide critical space for social and environmental staff in the decision making*

One of the contributing factors for the implementation level lapses has been the lack of critical space for social and environmental staff at SPU, DPU and CFT levels to have their concerns included in the planning and implementations. It appears that decisions relating to approval of plans, completion of work, release of funds, etc., are taken without the involvement of these staff. This has contributed to a feeling among all the concerned that social and environmental components are unimportant and weak links in the project. This needs to be rectified by providing adequate critical space for social and environmental staff at all the levels to have their concerns included in the planning and implementation, and be accountable for that.

Any mid-course corrections in the implementation policies, procedures and arrangements should be based on broad based consensus among different staff within SPU and approval to safeguard social and environmental concerns.
**Monitoring and Learning component**

There is immense need for adequate and qualified staff at SPU and DPU levels. SPU requires a trained M&L specialist assisted by a minimum of three research officers with sociology, agricultural environment and economics background. In addition, they need to have the support of the required number of research associates. Similarly, at DPU level, there is need for separate and independent M&L unit headed by staff having sufficient experience. Such unit should have sufficient staff.

**Improvements in the process cycle at the tank level**

The ongoing project has developed an elaborate process to be followed during the pre-planning, planning, implementation and post-implementation to facilitate consultations with different stakeholders at the tank level, ensure their participation and secure project benefits to them. However, the key issue is the seriousness with which these have been carried. In order to make these consultations meaningful, the following institutional arrangements have to be made.

1. A pre appraisal review by a multi-disciplinary team of experienced specialists at the DPU level including the required number of external experts of all draft ITDPs to ensure adherence to all social, environmental, gender and technical parameters of the project. This is to be linked with the final approval by district committee.
2. Before release of funds, assessment of TMI preparedness to commence implementation phase is needed.
3. A mid term assessment/audit of environmental, social and gender aspects is needed to ensure that all parameters are addressed during the project cycle and all components are given equal focus during implementation. This should be linked to the release of instalments to TMI.
4. A PRA of shorter duration should be undertaken at the beginning of the post-implementation phase to enable TMIs to review the performance of ITDPs and prepare a long term plan of operation and management, and further improvements in the tank, if necessary. This should also be linked with the release of funds.

The above would ensure that key milestones in gender mainstreaming, incorporation of environmental and tribal concerns are indeed achieved.

**Human resources**

Periodic assessment of human resources is essential to improve and maintain the quality in the planning and implementation of the project. In the context of the frequent turnover of personnel at all levels, an improvement in human resource policy including the selection, recruitment procedures, salary structure, incentives, etc., is needed. The participatory nature of the project requires highly skilled and experienced human resources and the future efforts have to be made to position personnel who have the belief in community oriented rehabilitation, requisite skills and proven experience for the community oriented project.

**Selection of CFTs**

The procedure should gravitate towards the selection of those CFTs having (a) belief in community based rehabilitation of tanks, (b) experience and expertise in mobilising the community for tank rehabilitation, and, (c) commitment to follow appropriate human resource and gender policies. The relationship with CFTs should be firmly rooted in the partnership framework, rather than donor recipient relationship. This requires frequent
consultations with CFTs to arrive at broad consensus on project policies, plans, targets, etc. This also requires the shift from current output based performance assessment to quality of the interventions and processes followed in the implementation process. Above would also have a positive impact on staff turnover within CFTs.

**Working with panchayat raj institutions**

Although four institutional options to rehabilitate tanks have been provided to the community to choose from, the society model has been the most favoured option. In this context, mechanism and organic linkages have to be built with Panchayat Raj institutions especially to access mainstream programs and services in the post project scenario.

- Institutional mechanisms at the district and taluk levels (under the chair of CEO and EO) should be established for the convergence of resources and to access mainstream programmes.
- The relevant departments such as agriculture, horticulture, forestry, livestock, fisheries and so on have to be more integrated into the planning and implementation of different project components.
- To ensure close collaboration between gram panchayats and TMIs during the planning phase, ITDP approval in the gram sabha should be made mandatory.
- There is need to converge funds earmarked to SGRY. In the planning and post-implementation phase, SGRY resources could play an important role since one of the objectives of the scheme is to generate employment opportunities by undertaking activities that augment productive resources. During the planning and implementation phase, SGRY resources could be used to undertake those activities that cannot be financed through ITDP. Similarly, during the post-implementation phase, the resources could be used for activities that could not be taken up during the rehabilitation phase.

**9.7 Budget**

The financial provisions made under the project for maintenance of plantations were found to be insufficient. To build the capacities of the community and to provide required assistance for maintenance of the plantations, additional financial support is required. With this background, the project is looking for agencies that can provide financial support to TMIs to improve the survival rate of trees planted in the foreshore area as well as in catchment area under the project. Among the existing supporting agencies it is found that “Carbon Trading Agency” is one of sources for consideration. The additional financial support is required for the TMIs to improve the following:

- To increase the plant density in foreshore area
- To improve the survival rate of the plants planted in foreshore as well as in catchment area as a part of soil erosion controlling measure.
- To establish a mixed plantation model to generate additional income to TMIs.
- To improve the tank eco-system in sustainable manner.
- To improve the micro-climatic conditions of the locality and sequestrating the carbon concentration in given locality.