

AIDE MEMOIRE

TAMIL NADU IRRIGATED AGRICULTURE MODERNIZATION AND WATER-BODIES RESTORATION AND MANAGEMENT PROJECT (TN-IAMWARM) - IMPLEMENTATION REVIEW AND SUPPORT MISSION (SEPTEMBER 10-18, 2012)

Project Data		Current Ratings and Flag		
<i>Board Approval Date</i>	<i>January 23, 2007</i>	<i>Summary Ratings</i>	<i>Last</i>	<i>Now</i>
<i>Effectiveness Date</i>	<i>April 09, 2007</i>	<i>Development Objectives</i>	<i>S</i>	<i>S</i>
<i>Closing Date</i>	<i>March 31, 2013</i>	<i>Implementation Progress</i>	<i>MS</i>	<i>MS</i>
<i>MTR date- Actual</i>	<i>March 05, 2010</i>	<i>Project flags</i>	<i>One¹</i>	<i>One</i>
<i>Original Loan Amount</i>	<i>US\$485 million</i>			
<i>Amount Disbursed</i>	<i>US\$231million</i>			

I- Introduction

1. A World Bank team² undertook an implementation review and support mission for the TN-IAMWARM project during September 10-18, 2012. The main objectives of the mission were to: (i) review the pace of project implementation, particularly with respect to civil works in the Phase IV (final phase) sub-basins; (ii) review capacity building programs for participatory irrigation management (PIM) and the Water Users Associations (WUAs), in particular the training provided by the Support Organizations (SOs), and training being provided to field engineers interacting with the WUAs; (iii) assess the status of project activities undertaken by the participating line departments; (iv) estimate disbursements under the Project for the next three quarters based on a review of major contracts; (v) review M&E performance and plans; and (vi) conduct other fiduciary review of the Project. The mission would like to thank all Government of Tamil Nadu (GoTN) officers and staff of all implementing agencies and of the Multi-Disciplinary Project Unit (MDPU) for their hospitality, collaboration and for facilitating the field visits that were carried out. The mission met with the Secretary, Public Works Department (PWD). The wrap-up meeting was held on September 17, 2012, and was chaired by the Principal Secretary, Finance.

II- Key Project Issues

2. **Issues Bearing on Achievement of Project Development Objective (PDO)** -- The development objective of the Project is to increase the productivity of irrigated agriculture for sub-basin stakeholders in a sustainable water resource management framework. Key elements of this include increase in yields, diversification of cropping patterns through increased share of area under high value crops, and improved water management practices. The Project is making good strides in

¹Disbursement lag.

²The Team consisted of Edward Cook (TTL), Krishna Pidatala (Senior Operations Officer), Ranu Sinha (Social Specialist), Dhirendra Kumar (Senior Procurement Specialist), R.K. Malhotra (Construction Design and Quality Specialist), Mohan Gopalakrishnan (Senior Financial Management Specialist), M.S. Swaminathan (Livestock Specialist) and Mudnakudu Nandeesha (Fisheries Specialist). Leena Malhotra (Program Assistant) and Sarita Rana (Senior Program Assistant) provided administrative support to the mission from the Bank's Delhi Office. Shankar Narayanan (Senior Social Development Specialist) visited Tamil Nadu during August 30-31 and September 3-5 and his contribution is reflected in this Aide Memoire.

achieving its objective. The trend of improved quality of tank and canal rehabilitation work observed over recent missions has been sustained. The participating line departments are continuing to make significant contributions to the Project through their work on field demonstrations and attention paid to achieving targeted impact areas. The Project is also in the process of turning more attention to strengthening the capacities of the WUAs and addressing issues associated with participatory irrigation management. Available intermediary indicators for farmers' income, irrigated area, and yields of key crops such as paddy (utilizing SRI), maize, and groundnuts all show progress consistent with achievement of the Project's objectives.

3. At the same time, the mission has identified issues that will need attention to enhance the developmental impact of the Project and ensure full achievement of the PDO. These issues are summarized here:

- ***Water management capacity at the local level*** – Stronger efforts need to be made to build the capacity of WUAs established under the Project to manage water resources at the local level effectively. While the mission notes that recommendations from previous missions have generally been followed through on, ramping up of these efforts is now required, as this area remains the weakest link in overall project performance. Key agreements for further action reached during this mission are provided in Section V below and focus on increased investment in human resources. The mission visited Ongur sub-basin where a project-supported activity of change management based on inclusion of a broad set of stakeholders is underway. The ultimate objective is community development and ownership of water management decisions that are supportive of both improved incomes and sustainable water management. The mission is impressed with the results of this intervention and fully supports its scaling up.
- ***Convergence of line departments at the local level and strengthening line department implementation capacity*** – The Project has been observing the principle of coordination among the participating line departments through the use of joint walk throughs at the stage of planning project interventions at the sub-basin level. More needs to be done, however, to achieve true convergence of the work of the line departments on a regular and ongoing basis. The Single Window Information Centers (SWICs) and associated convergence efforts that the mission viewed in Ongur represent a sound basis for moving forward on a broader scale. At the same time, the work in Ongur has underscored the fact that the existing implementation capacity of the participating line departments is not sufficient to raise the quality and reliability of interaction with project beneficiaries. Beyond Ongur, the mission has also encountered this fact in other interactions with participating line departments. *It was agreed that the MDPU will provide a plan for scaling up convergence and strengthening of line department implementation capacity that will include training requirements, additional staffing, and other expenditures combined with a time bound set of targets for results November 15, 2012.*

The common theme in both of these areas is increased investment in human resources. In the mission's view this is a necessary element of fully leveraging the substantial investments that have been made in improving irrigation infrastructure. Reliable models have been identified for productive investment in the needed human resources.

4. **Pace of implementation.** – There has largely been adherence to the milestones for project implementation agreed during the January 2012 mission. Chief among these was award of all remaining civil works contracts in Phase IV. Of 69 packages, only 1 was delayed substantially from the agreed timeframes. Likewise, the DPRs for the participating line departments for Phase IV have been approved and implementation of those plans is underway. The mission has a number of recommendations on maintaining the pace and quality of implementation of the civil works contracts,

which are detailed in Section III below. The implementation rating for the Project remains moderately satisfactory given the continued large lag in disbursements.

5. The mission undertook a detailed review of projected disbursements under the Project by quarter. With the completion of award of civil works contracts in the spring, outstanding commitments for contracts under Component A alone total over Rs. 600 cr. The bulk of the disbursements under these contracts is expected to occur starting for the autumn quarter of this year and will be reflected in the withdrawal applications for the autumn, winter, and spring quarters.

III – Component A: Irrigation Systems Modernization in a Sub-basin Framework

6. All 76 packages worth Rs. 450 crores awarded under Phase I sub basins have been completed. In respect of Phase II sub basin works, all 43 packages worth Rs. 189 crores have been awarded out of which 42 packages amounting to about Rs. 180 crores stand completed. The balance package is under implementation and is scheduled for completion by 30 September, 2012. As for the Phase III sub basin works, all 136 packages worth Rs. 451 crores have been awarded out of which 59 packages amounting to Rs. 136 crores are reported to have been completed and the balance 77 packages are in progress. The phase IV sub basin works comprise 69 packages worth Rs. 311 crores, including 22 packages of the newly included Amravathi sub basin costing Rs. 136 crores. All these 69 packages have been awarded and the works are in progress.
7. *Overall Physical Progress ending 31 August, 2012.* Tanks. Out of 4916 tanks, rehabilitation works have been completed in 3115 tanks. Anicuts. Out of 669 anicuts, rehabilitation of 537 anicuts has been completed. Supply Channels. Rehabilitation of supply channels in 5472 km out of the stipulated 8508 km length has been completed.
8. *Overall Financial Progress ending 31 August, 2012.* An expenditure of Rs. 947 crores has been incurred on the rehabilitation works. This marks an achievement of about 68% progress in Component A in financial terms.
9. *Additional Works.* Administrative sanction for the already agreed additional works comprising lining of field channels in head reaches and installation of measuring devices in Phase I and Phase II sub basin works amounting to Rs. 71 crores is yet to be accorded by GoTN. Having been abnormally delayed, the Administrative Sanction should now be expedited in order to enable timely grounding and execution of these works.
10. *Implementation of rehabilitation works in Phase III and Phase IV Tanks.* Rehabilitation of a large number of tank systems, particularly in Chennai Region, is still to be taken up. Out of 897 Phase III tanks, 341 stand completed; 383 are in progress, and works are still to commence in 173 tanks. Out of 543 Phase IV tanks, rehabilitation works are in progress in 152 tanks and works are still to be taken up in 421 tanks. *Regional Chief Engineer, Chennai should strengthen the contract management and also hold regular progress review meetings with contractors in order to achieve optimum progress for timely completion of works.*
11. *O.K. Card System.* It was satisfying to observe that the O. K. Card system, duly involving WUA, was operational and being well maintained for promotion of construction quality in the works.
12. *Construction Quality Management and Technical Supervision Consultancy.* This Consultancy is now fully functional and has greatly strengthened the Quality Management System by conducting quality

control tests independently as well as helping in the enforcement of specifications & correct construction procedures and quality control requirements in the execution of various rehabilitation works. Till August 31, 2012, it has reportedly conducted as many as 4576 quality tests in Chennai Region and 2807 tests in Madurai Region. The Consultancy has also conducted one training program of 3 days each for the engineers in the Madurai and Chennai Regions through experts obtained from CSMRS, Delhi (Central Soils and Material Research Station). The mission found the feedback from the engineers about this training program to be very useful. *The mission was also assured that, by September 25, 2012, this Consultancy would also commence monitoring of Amravathi sub basin works.*

13. Additional observations on progress under Component A are provided in Annex 2.

IV Component B: Agriculture Intensification and Diversification

14. The financial status of Agriculture, Horticulture, and the TNAU is given below. The disbursement rates over the last nine months have improved on the previous years, particularly for the Department of Agriculture. If the activities of these departments are to be completed by project closure the disbursement rates will have to continue to increase.

Financial Status (Rs. Crore)

Implementing Agency	PAD	Expenditure [^]	Expenditure against PAD
Agriculture Department	98.0	57.1	58%
Horticulture Department	73.0	52.6	72%
TNAU	88.9	53.4	60%
Total	259.9	163.1	63%

[^] up to 31/08/12

Tamil Nadu Agriculture University (TNAU)

15. Knowledge dissemination of agricultural information is a key activity in this project and e-Velanmai is an ICT based demand driven, participatory extension approach undertaken by TNAU. As of March 31, 2012 in the 19 participating sub-basins there were over 4500 clients of e-Velanmai who had paid Rs. 283,300 in fees. These numbers were comparable to what was reported by the January 2012 mission. For the current April – March year the program has enrolled 1500 new members who have paid Rs. 77,600 in fees. The plan for up-scaling could follow a PPP model or adoption by the Department of Agriculture. For its ultimate sustainability, a business model analysis would need to be developed. This was a point raised by the January 2012 mission as well. Economists in TNAU should be capable of carrying out such analysis.
16. The mission received a briefing on the Farm Level Optimal Cropping Pattern program developed by TNAU. The objective of the program is to provide farmers with crop planting advice to assist them in maximizing their potential income. The model incorporates information on soil types to determine appropriate cropping options. From there it incorporates information from the farmer on relevant

input constraints, including land, labor, capital, water availability and others. Utilizing input-output coefficients modified for the specific sub-basin, and pricing data, fed into a linear programming model, an optimal cropping pattern is generated. Certain other constraints are imposed, for example, with respect to possible area in certain high-value crops.

17. Development of this program indicates that there are data available for generating crop budget analysis of some of the important technical interventions being introduced by the Project. *It was agreed with TNAU to generate such crop budgets for SRI vs. traditional paddy for South Vellar sub-basin and to have this prepared within two month's time, or by mid-November 2012.*

Horticulture

18. It was noted that the major interest in expansion of horticultural crops was with farmers who had access to well irrigation, and that interest in these crops in ayacut areas during the wet season was nil. To support further expansion of horticulture crops, as part of the broader goal of introducing crop diversification, *it was agreed that project interventions in support of expansion of horticulture area could be conducted outside of registered ayacut areas within the selected sub-basins.*

Agricultural Engineering Department (AED)

19. **Farm Machinery:** The issue of providing farm machinery on a subsidized basis to individual farmers was raised by AED representatives to the MDPU. The mission reiterated its position expressed in the September 2011 and January 2012 Aide Memoires as to why it was opposed to use of project funds for this activity. Barring this intervention, it is unlikely that the budgeted allocation for farm machinery will be utilized. *The mission recommends that this allocation be adjusted downward to reflect actual expected expenses for agreed activity.* This will likely result in savings of roughly Rs. 10 cr.

Agricultural Marketing

20. The mission reviewed progress against the agricultural marketing action program agreed to during the September 2011 mission. The three areas of work are: (i) investment in Commodity Groups (CGs); (ii) establishment of District Facilitation Centers (DFCs); and (iii) a set of studies on selected value chains and on the operation of the CGs and Agribusiness Centers (ABCs). The mission notes that, overall, progress against agreed action has been slower than agreed. Under the first point, the DPR for the main Commodity Group investment (Rs. 1240 lakh) to support creation of new CGs has been approved and is in implementation. The DPR for Commodity Group value addition (Rs. 803 lakh) is still in process. The reason cited by DoAM is that more time than anticipated was needed to assess the actual value addition possibilities at the CG level. In general it appears that efforts to build CGs and support higher levels of value addition are proving to be more challenging than anticipated. *It was agreed that the DPR for CG value addition would be sent to the Bank for review by Sept. 30, 2012.* One factor potentially holding up the growing of the CGs has been the delay in establishing the DFCs. During the January 2012 mission it was agreed that these would be set up under the auspices of the DoAM. A total of 13 districts have been selected and the proposal for the establishment of the DFCs is nearly complete. *It was agreed that this proposal will be submitted to the Bank for review by September 30, 2012.* The number of CGs established under the Project has reached 2106 against the upward revised target of 2500. The number of MOUs signed with purchasers has also continued to increase and has reached 1473.

21. In accordance with point (iii) above, a study of the CGs and ABCs is underway and is to be completed and submitted to the Bank for review by December 31, 2012.
22. The mission noted that DoAM is tracking data on the value of sales by CGs and net income accruing due to higher prices received in comparison with prevailing market prices. However, due to staffing shortages, that data is collected only for the CGs that are newly formed in a given year. DoAM is not able to maintain information linkages with earlier established CGs to collect data on the full picture of project impact. DoAM will need additional human resources for staffing the DFCs and for improving their data collection abilities. *It was agreed that this additional hiring should be on a consultant basis with initial fixed term contracts*, rather than permanent additions to the DoAM staff allocations. This will both facilitate the process of hiring and provide forward flexibility with regard to staffing decisions.

Fisheries

23. Fisheries activities are showing good signs of stabilization and this deserves appreciation. Good success is seen in tilapia culture in cages, earthen seed banks, ornamental fish culture in earthen ponds, hapa nursing of fish seed, farm ponds, and kiosks. Sustainability of these activities after withdrawing the project support needs to be captured and shown through data.
24. Recognizing the above issue, in the previous mission documentation of the project accomplishment and study on sustainability was suggested. This suggestion remains valid and project management may place high emphasis on this component. A critical analysis of the results is essential to find path for sustainability. *It has been agreed that this task would be completed by 31st December, 2012.*
25. Kiosks in majority of places have proved to be useful in providing quality fish to people. In order to make them economically viable, entrepreneurship training for the leaders of these Kiosks may be organised. Addition of other fish products like fish pickle, noodle, fish masala, etc., including the sale of other meat products may be examined as one stop shop to procure all types of animal protein. It is proposed to organise the training by January 2013.
26. Promotion of fish as health food through the kiosks provides a good opportunity. The National Agriculture Development Project support to Fisheries College and Research Institute in Thoothukudi can be linked and taken advantage to strengthen kiosks. This discussion agreement would be reached by 30th October, 2012.
27. The target of seed production that needs to be accomplished in the remaining time of the project period by establishing one hundred earthen fish seed banks is huge. This component requires close support from the Engineers of the Fishing Harbour Division of the Department. In addition, provision of adequate staff to ensure this large target implementation in limited span of time is essential. Identified farmers may be exposed to seed nursing activity being carried out by large number of farmers in Andhra and empower them to accomplish the task.
28. The link between the WRD and Fisheries Department requires strengthening. With the renovation of several tanks and improvements in water storage, secondary benefit of water can be best harnessed by the Fisheries Department by timely stocking of these tanks. Many of these tanks suffer from weed infestation and they need to be cleared regularly. As many tanks dry up, these tanks also provide opportunity for enhancing fertility through various approaches. As there is good opportunity to increase fish production in these tanks by timely preparation of tanks and stocking them with good size seed, by entrusting the responsibility of fish culture in tanks to Fisheries Department, not only fish production under the project can be increased, but also in the entire state. This is a huge fish

mine that needs to be exploited to step up per capita availability of fish from the current level of less than 9 kg to a global average of 17 kg. Public Private Partnership mode can be examined to ensure success of fish culture in these seasonal tanks and this requires examination of annual leasing policy as well as issues related to fishing rights. This being a major policy issue, it is requested that this matter be examined by the Secretaries of various Departments.

29. Reservoir stocking of seed in some areas needs examination and if the revenue realized is less than the cost of the seed stocked, recognising the demand for seed for tanks, these seeds may be diverted to stocking of other tanks. This situation is seen in Mordhana reservoir. However, this reservoir would be best suited for cage nursing of seed, if tree stumps can be cleared. Executive Engineer of the area is willing to help and it is suggested that savings available be utilised to undertake this task. This will help in increasing the productivity of the reservoir considerably. These will be included in the supplementary DPR planned to be prepared to utilize the balance amount of Rs. 124 lakhs.
30. Nursing of fish seed in ponds should be carefully monitored and documented since this activity has potential for scaling up. Nursed seed should be procured and stocked in identified tanks. At the end of the project period there must be clear evidence to demonstrate the benefits of seeds stocked to various water bodies. Since it is too late for this year to commence the activity, it is proposed to start the activity by June 2013, pending extension of the current project closing date.
31. Training of staff in tilapia seed production and fish culture in cages should be completed within three months. This would help in providing good support to project. Staff may be sent for training within two months. It is proposed that trainees be sent for training by December, 2012.
32. Strengthening of IAMWARM fisheries cell needs to be taken on high priority. There is a need for an Inspector of Fisheries and Assistant Director exclusively for IAMWARM project activities monitoring and backup support. The cell also should be provided with two field monitors until the field data collection and analysis is completed. An Accounts Assistant to assist the project may be posted. It is requested that these postings be completed on an emergency basis, keeping in view that project has to utilise nearly 50 % of the total project cost in a limited period of time and demonstrate measurable outputs. More detailed observations on the status of the Fisheries work under the Project are provided in Annex 3.

Livestock

33. Reported cumulative achievements of the Animal Husbandry Department (up to March 2012) in their proposed activities i.e. fodder cultivation with different fodder species, Azolla demonstration, fertility cum animal health care camps, farmers' interactive meetings, farmers' trainings, farmers' exposure visits, artificial Insemination, estrous synchronization, and deworming of heifer calves, sheep and goats, are to the level of 100%. The reported female calf production (cumulative till FY 2011-12) is 236,291 calves. With a targeted calf mortality of 10% in female calves and 5% in adult mortality, around 200,847 lactating animals will be available in the project area from the AI carried out till the FY 2012. This is against the total target of 166,000 lactating animals to be produced in all the 4 phases, amounting to an achievement level of 121%. The increase in estimated milk production from the start of the project is 460 M tons. The cumulative financial utilization for the FY is 88% against the targeted outlay of 295.1 million INR.
34. The achievements are laudable and the impacts are visible during the field visits and interaction with the farmers and few representatives of the WUAs. The notable activities which the farmers significantly recognize are fodder production, availability of breeding services at the doorstep of the farmers, and addressing the infertility problems of their cows. As reported by many farmers, their

confidence level in adopting dairying and animal husbandry as a diversified and intensified livelihood activity has improved many folds owing to the reasons of frequent visits of the vets and their staff, their increased closeness to the project villages and timely availability of breeding and veterinary inputs, and their continuous advise on husbandry practices which were not happening before. The AHD officials working in the project villages overwhelmingly acknowledge the impact due to their continuous presence, interaction in the villages, timely availability of quality seed materials, feed supplements, and veterinary medicines, financial support for executing camps, and incentives which were made available through IAMWARM project.

35. The discussions with the AHD staff suggest that the IAMWARM project has created a platform to understand their roles on how efficiently a livestock project could be implemented and how to carry it out in collaboration with the other agricultural developmental agencies. It was also understood that the implementation processes of the various project activities are motivating the Govt. of TN to use this as a model for their own livestock development programs. Visit to a model village Thenpalangi (under Therkar sub-basin where the convergence and Single Window Information Center (SWIC) activity is being implemented) and interaction with the other line departments did confirm the claims. The increased interaction among the line departments has resulted in effective implementation of the programs.
36. The AI program and the increased production of lactating animals are being achieved and the improvements in the technical parameters such as conception rate and calf birth rates are appreciable as per the reports (55% conception rate in the FY 2010-11 and 53% calving rate in the FY 2011-12). But these figures need to be worked out as per the practices followed in general throughout India for ease of comparison. Further these figures need a validation (by a third party) for its accuracy. The same applies to the milk production estimates, reportedly a growth of 5% increase in milk yield per annum, but this figure requires a scientific approach and supporting data to substantiate the claim.
37. Fodder production has played an important role in executing the other programs more efficiently, because nutrition is a base for overall animal production. Many small farmers have been assisted through fodder production and almost half of the farmers continue to maintain these fields. In many places the fodder production got extended to other farmers in the villages through the supply of seed materials (fodder slips) produced from the beneficiary farmers. However, in few places we could observe that large farmers have been given seed materials in large quantities which could have been utilized for covering large numbers of small farmers who have problems in purchasing the seed materials at cost. Also, a clear documentation on the increase in land area under fodder cultivation and quantum increase is hard to find with the project officials. This is essential to plan for future fodder development programs for the available livestock in the villages.
38. Azolla demonstration programs do not seem to penetrate the farming community. Few farmers who were provided with inputs continue to maintain the tanks. The reasons quoted for non-adoption is death of seed culture after few months. Follow up on the culture practices of the farmers on continuing basis may improve the adoption and success level among the farmers. Otherwise the program may not produce the desired outcome. Also there is a need to analyze and document the reason for failure for future technology improvement.
39. The WUA veterinary units are nearly non-functional due to the non-availability of Veterinarians and this has created a big vacuum. The difficulties are visible among the farmers especially for availing breeding services at their door steps. Urgently these centres need to be filled up with Vets or an alternate mechanism such as providing AI services through trained AI technicians to be worked out. An emphasis needs to be placed on delivery of inputs such as feed supplements, hormones for

infertility treatment, etc., to the economically weaker section of the farmers who have problem in accessing these resources.

40. Sheep and goat deworming is appreciated among the farmers, but the results of the programs such as reduced worm load, reduction in kid mortality, increase in growth rates require documentation in the project villages. The same applies to supply of mineral licks to the heifer calves. The department should think of establishing infrastructures for the marketing of sheep and goats (such as forming a producer group, provision of weighing machines, providing market information) which can ensure a better negotiating platform and a better price for the live animals.
41. The project implementing staff needs more orientation in planning for breeding programs and mating plans in respect to their production systems. In addition, their capacity needs to be strengthened in modern practices of handling infertility problems and result based project monitoring methods. More detailed observations on the status of livestock activities under the Project are provided in Annex 4.

V -- Component C – Institutional Modernization for Irrigated Agriculture

42. **Strengthening the WRO PIM Structure:** The Mission met with the regional PIM unit in the Trichy Region. The Mission was pleased with the functioning of the Trichy regional PIM structure. *This model should be adopted by the other three regional PIM units of Madurai, Coimbatore, and Chennai. Specifically, the Mission finds that the effort of the Trichy Assistant Executive Engineer (AEE) in charge of operationalizing the PIM unit is to be highly commended and applauded.*
43. Key features of the Trichy model are as follows. An AEE who has undergone change management trainings manages the Trichy regional PIM unit and there are two AEs that are under his charge who have also undergone change management training. The regional PIM unit has a total of 634 WUAs under its charge in eight sub basins. Its key functions are to coordinate the Competent Authority (CA) trainings being conducted by the Center of Excellence for Change (CEC), coordinate trainings for WUA presidents and TC members, and collect and transmit data on PIM activities in the region. Below the regional PIM unit, three circle level PIM units have been formed, each having one AE and one AEE. The circle level units are in charge of transmitting information about PIM activities from the division level to the Trichy regional PIM unit. Below the circle level PIM units, three division level PIM units have been formed. Each division unit is staffed with one Executive Engineer (EE) and two AEs. The division level PIM units are in charge of overseeing a range of 40 to 240 WUAs and CAs, they coordinate directly with CAs at the field level and assess the status of WUA performance and provide the necessary support. They also monitor the activities of the CA and assess training needs of farmers, specifically less well performing WUAs.
44. Recommendations from the Trichy engineers of the WRO PIM units on system improvements included the following:
 - a. The PIM unit at the E-in-C office should periodically travel to the four regional PIM offices to provide direct guidance and advice on promoting PIM activities. This activity should be carried out through field visits of the head PIM unit staff to the regions, during which concerned EEs and SEs should also try and be present to ensure coordinated effort in conveying coherent messages on PIM to the field level entities such as SOs, WUAs, AEEs, and AEs.
 - b. PIM training should also be imparted for AEE, EE and SE level engineers in addition to Competent Authority engineers receiving training. This is critical because in its absence the CA AEEs would not have the “enabling environment” to further the cause of effective water management in partnership with WUAs as espoused in the TNFMIS Act.

- c. PIM units at the division level should be strengthened with staff of expertise beyond engineering including social science, agriculture, and water management. Therefore, a multidisciplinary unit should be set up at the regional level PIM units. The staff in these units should be 100% dedicated to PIM activities.
 - d. Assistant Engineers, as CAs, are not able to sufficiently meet PIM related tasks in the field as they are currently working with about 50-60 tanks each, therefore, as PIM is an additional charge for the CAs they cannot perform all of their required duties adequately. They recommended that additional staff be hired to support them in the field.
45. Dedicated staff for the PIM units is an absolute necessity that needs to be addressed as each of the five PIM units are now responsible for supporting an increasing number of WUAs. The following actions have been agreed with the WRO PIM unit: a) five social scientists with advanced degrees should be hired to be deployed to the four regional PIM units as well as the Central PIM; b) 120 support staff with graduate degrees are to be hired for two years to support the 150 Competent Authorities in Phase 1 and 2 sub basins full time for PIM and WUA development activities. The 120 support staff will be divided according to the number of WUAs in each of the four PIM regional units. Therefore, the Chennai Region will be allocated 52 support staff, the Coimbatore Region 1 support staff, the Madurai Region 35 support staff and the Trichy Region 32 support staff. *It was agreed with the E-in-C and the MDPU that detailed Terms of References for the five social scientists and the 120 support staff be sent to the Bank for comment and approval by November 1. 2012. The Mission recommends that staff from the MDPU assist the WRO PIM unit to prepare the TORs according to technical guidelines.*
46. The Mission recommends that all WRO staff that are engaged in PIM activities in the head PIM unit at the E-in-C office and the four regional PIM units with the rank of AEE, EE, and SE should be fully trained in PIM and water management as part of the ongoing trainings for the CAs. The Mission understands that there are unspent training funds available with IMTI for conducting PIM related trainings; these funds therefore should be utilized to carry out these necessary trainings for current and any future staff working on PIM activities in the five PIM units in Tamil Nadu. *The Mission urges that a detailed training schedule should be prepared by the CEC training facilitators for approximate 50 PIM WRO staff that are currently working in the four regional PIM units and forward to the Bank for review and approval. These PIM trainings for all PIM staff in the head and four regional PIM units should be completed by the end of 2012. This action has been discussed and fully agreed.*
47. There is an urgent need to have WRO staff that are solely dedicated to carrying out PIM activities at the regional PIM units. This includes redeploying WRO staff at the EE level to the four regional PIM units. *The Mission recommends the PIM unit at the E-in-C office to prepare and forward a proposal to the WRO Engineer-in-Chief to redeploy WRO officers to the four regional PIM units who will be solely dedicated to PIM activities. This action has been discussed with the E-in-C office, the PIM unit staff at the E-in-C office, and the MDPU team but not yet been agreed.*
48. The change management trainings to WRO staff have resulted in positive outcomes for PIM activities. For instance, specific individuals as a result of attending the change management training have been motivated and driven to take leadership in strengthening and institutionalizing PIM activities at the regional PIM unit in Trichy. Other engineers have taken full ownership of initiating water management and water budgeting activities at the village level with WUAs and other water users in the Madurai Region. The Mission finds that nominating WRO staff that has undergone change management training as key staff to the regional PIM units will have a significant impact in strengthening PIM activities throughout the state. *The Mission recommends that the PIM Unit at the E-in-C office nominate a list of the WRO staff who have undergone change management training to*

be nominated to the regional, circle, and/or division level PIM units to the E-in-C at the earliest so that they may be deputed to these respective PIM units. This action is under discussion with the PD MDPU, the PIM unit at the E-in-C office, and the MDPU team.

49. **Support Organization Training:** The in-depth training of the Support Organizations (SO) conducted by IMTI and CEC has been completed for the Phase 1 and 2 SOs. However, only seven out of the ten SOs attended the training. *The Mission recommends that the MDPU provide the Bank with a report of the three SOs that did not attend the training, the reasons why and what measures are being taken to ensure that these SO training needs are met.*
50. In the Trichy Region the mission met with one SO that had undergone the in-depth training in the Pambar sub-basin. The Mission also travelled to the Madurai Region and met with a second SO in the Sivaganga District. During these discussions, the Mission learned that: a) the SOs would like more field training days during the in-depth training sessions, b) SO payment procedures need to be further clarified and streamlined, c) SOs would like to interact with non-performing WUAs as well as successful WUAs during their training, d) para workers and the training of para workers should also be included as part of the training modules, e) modules on conflict management need to be more detailed and strengthened during the training, and f) modules on WUA financial record keeping need to be included.
51. These observations and modifications requested in the training are corroborated and confirmed by what was seen by the Mission in interactions with three other SOs- one in Salem District and the other two in different sub basins in the Madurai District during a visit in advance of the main mission (September 3 to 5, 2012). During the September 3-5 visit, the Mission found that while training was being imparted to WUAs on the provisions of the TNFMIS Act, no opportunity had been provided for farmers to air their grievances related to the lack of consultation or involvement vis-à-vis planning, design and implementation of the TNIAMWARM supported sub-project in their WUA. The Mission found that a) training programs were highly theoretical and held using a classroom lecture based method rather than an interactive training approach; b) there is need for much greater effort to focus on specific problems being faced by farmers and WRO engineers in facilitating participatory irrigation management if the training is to be truly interactive and aimed at improving the status quo; and c) the training facilitators should be following up with visits to field areas where SOs are conducting capacity building activities to monitor SO performance in the field and provide additional support if necessary.
52. *It was agreed that the following changes be incorporated for the subsequent trainings to be conducted for the remaining Phase 3 and 4 SO packages once they are hired:*
 - a. Additional field training should be incorporated into the current design of the training that emphasizes how to conduct interactive training that is focused on problems being faced by the farmers and by WRO engineers in ensuring effective implementation of PIM specifically with respect to the TNIAMWARM supported system/tank modernization in that area
 - b. Interaction with non-performing WUAs should also be incorporated into the training design with specific focus on identifying areas where WUAs need attention by WUA representatives as well as WRO representatives
 - c. A more detailed module should be prepared and presented to the SOs on SO payment procedures, this module should also include training of the responsible WRO SEs/EEs/AEEs alongside the SOs to be present and trained together to minimize payment issues during the term of the contracts
 - d. A detailed module should be included into the training modules on how SOs should empower, train and effectively use their para workers to ensure effective mobilization of

- WUA farmers. Specifically, a full day should be dedicated to training SO team leaders and community organizers on how to train their para workers
- e. An additional set of training days should be included into the current training design that enables SOs to include some of their senior para workers into the training alongside the team leaders and the community organizers
 - f. A detailed module and specific case studies should be included on conflict management and dispute resolution among farmers of WUAs. This will enable SOs to learn to manage conflicts when they begin their capacity building activities on the ground with the WUAs
 - g. A session on WUA financial record keeping should be included into training schedule
53. The Mission recommends that the MDPU convey the message to the SOs that they should utilize local WUA presidents from nearby villages who are very active and advanced WUA members as key resource persons in training the WUAs. These are invaluable resource people whose use as agents for mobilizing and sharing experiences with other WUAs will bring additional benefits of further honing their skills as trainers and increasing cooperation among neighboring WUAs and farmers.
54. The Mission finds that SO activities and quality of performance currently need to be monitored in more detail. *Therefore, the Mission recommends that the four PIM regional units alongside the CEC training facilitators monitor performance of the SOs for the Phase 1 and 2 sub basins where SOs have already begun to work and provide regular reports to the MDPU.*
55. The Mission recommends that the inclusion of the CEC in-depth SO training be included into the text of the TORs of Phase 3 and 4 SOs to be hired so that this set of trainings is finalized into the operational activities of the next three phases of SOs to be hired. *The Mission urges MDPU to modify the text of the TOR accordingly and submit to the Bank for review and clearance. This action has been discussed and fully agreed.*
56. **Support Organization Performance:** One of the Support Organizations in the Phase 1 and 2 packages is currently not functioning. The SE WRO from the Trichy Region indicated to the Mission that the SO New Life, which has been awarded the contract for packages two and four in the South Vellar and the Agniyar, Ambuliyar sub-basins is not performing according to the expectations of their contract. Due to the non-adherence of their contract, the Mission has no objection to MDPU's proposal to terminate the contract with New Life. *The MDPU is to send a proposal for hiring of a new consultant to the Bank for review and clearance at the earliest.*
57. The SO RAESO, that has been allocated the contract for working in the Pambar sub-basin of the Madurai Region, package three of the Phase 1 and 2 packages is currently not performing due to delays in payments for their work. The payments from the WRO have been stopped because key personnel from the RAESO SO team as originally stipulated in their contract have been changed for which approval from the World Bank has been requested. Although the SO team leader and two community organizers attended the in-depth SO trainings and have now hired 35 para workers, they refuse to do any further activities as per their contract due to non-payment for activities completed. *The Bank team is now aware of this issue and will come to a decision on how to proceed with RAESO and advise MDPU on next steps at the earliest.*
58. The evaluation committee for evaluating the performance of the SOs currently includes membership of a Joint Director from the Agriculture Department of the Government of Tamil Nadu. The evaluation committee should meet regularly and review SO performance and clear SO payments in time so as to ensure optimal performance of the SOs in the limited time remaining in their contracts. *Since the agriculture activities have been removed from the TORs of all of the phases of SO packages,*

the Mission recommends that the Joint Director position be removed from the membership of the evaluation committee. This action has been discussed and fully agreed with the MPDU team.

59. **Competent Authority Training:** The first batch of a total of five batches of the Competent Authority training was conducted from the 28th to the 31st of August 2012. A total of 29 engineers from various districts were trained. The Centre of Excellence for Change conducted the first four-day training of the CAs in a systematic manner in collaboration with IMTI Trichy. The agenda and training schedule was carefully worked out by CEC and IMTI and resource persons were brought in as required, however the arrangements were a bit ad hoc. The draft training report has been reviewed by the mission and suggestions made on improving the same to do justice to the event as well as contribute to learning and improvement in the upcoming batches of the CA trainings. The Mission finds that there is a need to confirm resource persons for the training in advance and ensure that they keep to their committed schedule. The mission recommends a thorough stocktaking of the experiences from the first CA training including follow up with the trainees in their field sites for CEC and IMTI to incorporate the learning into the design of the training for the next batch. *It was agreed that the Bank comments be incorporated into the training report and the finalized report sent to the Bank at the earliest.*
60. The Mission met with three engineers who had attended the CA training from the Trichy Region and two from the Madurai Region who provided feedback. They informed the Mission that the training significantly helped to raise their awareness levels of need for better water management and for interacting with farmers to address the concerns of water scarcity in their state. They also admitted that prior to the training they had little to no understanding of the concept of Participatory Irrigation Management and the function of WUAs. One engineer admitted that it was his first time receiving any training on PIM and WUA capacity building. They also appreciated their enhanced awareness of the concept of ‘social engineering’ and understood the importance of interacting directly with their community members. Some pointed out that prior to attending the training, they were only visiting the tanks under their jurisdiction, however the training has enhanced their desire to meet farmers and view farmers as their constituents—which is a transformational change and a credit to the quality and impact of the CA training.
61. Consistent with the point made above of the need for additional staffing for PIM, the CA engineers pointed out that PIM activities are an additional charge. An AEE/CA has an average of 50-60 tanks under his/her jurisdiction and in addition he/she has been given the responsibility of providing support as a CA to a range of 20-240 WUAs. The AEEs/CAs admitted that these additional duties of working with WUAs are beyond their capacity, as they do not have the time to cover all of the WUAs in their area of jurisdiction.
62. The engineers also provided feedback as to how the trainings can be further improved. This included suggestions such as: a) field visits during the training, b) increased modules on WUA financial record keeping, and c) increased modules on conflict management and dispute resolution with WUAs.
63. *It was agreed that the following modifications be incorporated into the next four batches of the CA training for Phase 1 and 2 sub-basins:*
- a field visit incorporated into the CA training days
 - A detailed module designed for increasing knowledge of CAs on how to train farmers on WUA financial record keeping
 - A detailed module for how CAs can manage disputes and conflicts with farmers of WUAs
 - A detailed module to be developed that includes providing CAs with guidelines on their specific roles and responsibilities as CAs on a weekly, monthly and annual basis with respect

- to WUAs. The CAs should be able to take this guideline with them back to their respective regions.
64. A follow up round of training for the Phase 1 and 2 CAs can further enhance the efficacy of the current Competent Authority training. *It was agreed that the first round of trainings for the Phase 1 and 2 CAs be repeated for the 150 engineers by February 2013 and that CA training for the remaining Phase 3 and 4 also include a follow up round.*
65. The Mission strongly feels that in order to monitor the performance of WUAs and to identify whether WUAs are effective or not, a dedicated activity for measuring WUA performance needs to be conducted. This activity can be initiated during the CA trainings and then subsequently implemented by the CA engineers with their respective WUAs. *It was agreed that the CEC training facilitators engage the CAs in an exercise to develop a set of agreed common WUA performance benchmarking criteria that will be developed into a WUA score card to be implemented by the CAs. This exercise should be conducted during the second round of CA training for all CA training batches of Phases 1 through 4. The Bank has provided guidelines for specific themes that should be included in the WUA benchmarking exercise.*
66. The Mission discussed and agreed with the PD MDPU and the MDPU team that there is a need to hold a multi-state PIM conference in India, particularly showcasing innovations on WUA capacity building and water management that are taking place under the project. *The Mission recommends that the MDPU prepare a proposal to detail the concept, objectives, timeline and potential participants for the PIM conference and forward to the Bank for review.*
- ## **VI -- Component D –Water Resources Management**
67. The Government of Tamil Nadu has proposed that the State Water Resources Management Agency (SWaRMA) act as a nodal agency for the water sector in accordance with the Government of India's recent recommendation for establishment of water commissions at the state level. In this role, SWaRMA will advise the Government of Tamil Nadu on water policies including water resources development, regulation, and management within a holistic river basin framework.
68. The Mission held discussions with the SWaRMA team including with the newly appointed SWaRMA director and newly appointed members of the SWaRMA working group. The Mission was pleased to learn that most of the vacancies of the working group have been sanctioned and new positions added to the working group that will further enhance the effectiveness of SWaRMA operations in Tamil Nadu. The mission learned that the proposal for hiring of a social scientist for SWaRMA is still under consideration with the government. *The Mission urges the remaining positions to be filled at the earliest including that of the social scientist, legal advisor, and other new proposed positions for the working group.*
69. The proposal for the inclusion of technical officers from multiple line departments for the SWaRMA Water Advisory Committee is still with the government. *The Mission recommends the Government of Tamil Nadu approve and sanction the membership of additional officials from the line departments to the Water Advisory Committee at the earliest.*
70. The SWaRMA team informed the Mission that the proposal for the execution of the State Water Committee, which will include the Chief Secretary and Secretaries of the relevant line departments, is currently still with SWaRMA. *The Mission recommends that this proposal be forwarded to the Government of Tamil Nadu for approval and sanctioning at the earliest.*

71. SWaRMA has modified an earlier Terms of Reference for a consultancy to design, develop & install a GIS-enabled web based system for state water information. The SWaRMA team held technical discussions on this modified TOR with the Mission to seek clarifications prior to forwarding to the Bank for approval. The Mission supports the concept of a statewide water management information system and stressed two principles – harmonization and strengthening existing institutions for this purpose. *It was agreed that SWaRMA should – (a) engage ELCOT as its technical advisor to assist with the TOR and liaise with the consultants when they are hired, (b) split the TOR into two stages – (i) assessment of current systems & gap analysis, and (ii) design & development of the proposed GIS-enabled web based water information system, (c) pilot the GIS-enabled system in two sub-basins that are different, and (d) consider hosting the system at IWS or the State Ground and Surface Water Resources data Center (SG&SWRDC) to encourage harmonization and strengthening existing institutions.*
72. The Mission learned that SWaRMA has completed data collection for the Vaippar river basin (one of the basins included in the Hydrology II Project) of both surface water and ground water data. The study has now been completed and the data are now available with the SWaRMA officials. The data are very useful and should now be shared with the relevant line departments that can utilize the information.

VII – Information & Communication Technologies (ICT)

73. The Mission reviewed the progress of the design & development of the Enterprise Information Management System (EIMS) and is concerned that the EIMS would only be completed by the closing date of the project. The immediate need is to accelerate the specification and approval of the “AS-IS” and “TO-BE” processes and address operational bottlenecks in this process. The details of the ICT function review are attached in Annex 5. *The Mission recommends the following- (a) Engineer-in-Chief to put in place a counterpart team to work with the EIMS consultants by September 30, 2012, (b) the next 2-3 months are critical and a formal process needs to be put in place officially to expedite the approval process for AS-IS and TO-BE processes, and (c) the associated staffing to maintain the EIMS at the ELCOT data center should be determined and planned accordingly.*
74. The explosive growth of the mobile phone platform (70% of Indians have access to a mobile phone now) is a game changer and IAMWARM should embrace ICT to support and transform all project activities. The Mission noted the IAMWARM project could benefit from an overall ICT strategy that provides a roadmap to further leverage ICT in the project component work – upon project extension. Although it may appear to be late in the project, an ICT study can still add value on several fronts – (a) identification & piloting ICT innovative solutions in all project components, and (b) proposing a strategy for leverage ICT for support IAMWARM components using various new technologies over the next 2 years. *The Mission recommends that MDPU – (a) engage a consultant for 45 days to carry out a study on “leveraging ICT” to benefit the project activities, and (b) explore the possibility of actually leveraging ICT innovative solutions during the remaining project period after the study.*
75. ICT has been leveraged extensively (albeit in a fragmented manner) in the agriculture & water sectors in Tamil Nadu. GIS is one of the new ICT tools and several agencies (MDPU, IWS, SWaRMA, SG&SWRDC, and TWAD Board are all currently using it in a variety of ways. However this use is often fragmented with duplication, different standards, work in silos and insufficient coordination leading to a less than optimal solution. There is a need for convergence on web-based GIS, ICT systems and infrastructure. The Mission recommends IAMWARM explore the possibility of

harmonization of ICT within the project at two levels – (a) *ICT systems – a state level nodal agency that captures all agricultural modernization & water information, and (b) ICT infrastructure – possibility of maintaining all this information in one data center with attendant savings on ICT hardware, software, licensing, maintenance and associated staffing.*

VIII–Monitoring and Evaluation

76. The Mission noted that the results framework needs to be refined to ensure that it captures relevant and measurable information that is aligned to the Project Development Objective. A number of indicators in the PAD were poorly specified and the number of indicators was excessive. The joint review and proposed refinement of the RF resulted in the replacement of 8 indicators with 1 new indicator and slight modification to 4 indicators. The proposed changes will not affect the development objective and overall outcome targets. The Mission will seek Bank management approval of these changes. The details of the M&E function review are attached in Annex 6.
77. The Mission noted that the Baseline Report contains a wealth of information on project initiatives but needs to pull information on Key Performance Indicators (KPI) into a single table. It was agreed to add a summary table for KPIs and as part of the table to specify the methodology used corresponding with the measurement of each KPI.
78. The final Impact Evaluation survey is currently scheduled for March 2013 in accordance with the current Project closing date. This will not be effective as it allows less than one year to assess impact. However, the project has requested an extension of 18 months. *It was agreed that pending project extension, the final impact evaluation survey and report will be pushed back by 18 months.*
79. The Mission noted that the project reporting coming through the MDPU is focused mainly on financial expenditures and physical outputs. Physical progress details are left to the lower levels and reporting is mainly confined to outputs. Currently, the project reports are not well coordinated with KPIs and in general do not place adequate emphasis on the demand side of the Project. The mission worked with the MDPU on ways in which the project reporting can be improved and incorporated feedback from the MDPU in reviewing which KPIs can be regularly updated.
80. The Project commissioned the development of a PMIS to leverage ICT to create a web-based system to capture monitoring data from all the implementing agencies into one system. The PMIS has recently been completed and it is yet to be rolled out fully. The PMIS will need to be modified to incorporate the proposed modifications in the KPIs. *The Mission recommends that the PMIS be – (a) modified to incorporate the refined indicators, (b) the central repository for all information needed for the project reporting, and (c) the source of all quantitative information detailed in future project reports.*
81. The project could benefit from participatory monitoring and citizen feedback on project initiatives and activities. This could have a positive effect on the massive investments in infrastructure and agricultural services being offered. Social Accountability approaches will bring about greater understanding between the service providers and the beneficiaries and leverage project benefits. In that context, the Mission would like to suggest that the project consider utilizing these approaches. Community Score Cards (CSC) is one such tool that could potentially be used to capture citizen feedback and satisfaction on service delivery, governance, IEC, etc. Normally, Community Score Card exercises are carried out in 10% of the project locations for different initiatives. *The Mission recommends that the project – (a) pilot the CSC exercise in 10% of the project initiatives in one or*

two sub-basins, (b) gather information from the pilot, and (c) decide upon scaling it up at a later stage.

VIII – Financial Management

Disbursement Status & Budget: The disbursement position is as under:

Financing From:	IDA	IBRD	Total
Allocation	153.78	335.00	488.78
Disbursed	153.78	76.41	230.20
In Pipeline with the Project	-	9.75	9.75
Total	153.78	86.17	239.95
% Disbursement	100%	25.72%	49.09%

* IBRD includes DA-Advance of USD 17.00million.

** Claims in pipeline with the project (relating to the quarter ended June 30, 2012)

The project has been timely in the submission of the quarterly IUFRs and disbursements have been made for expenditures reported till quarter ended March 2012. The budget for FY 2012-13 is Rs 790 crores which is considered adequate for the project.

- 82. **Financial Management:** Since the previous mission, the project has (i) submitted the responses on the external audit reports for the year 2010-11, (ii) submitted actions taken by agriculture department to address the weaknesses identified; (iii) completed the audit of TNAU component by LFA; and (iv) carried out a field visit to Thiruvallur district indicated that the internal controls over payments to suppliers, distribution of inputs to beneficiaries and reconciliation of expenditure by DDOs with sub treasury/ treasury is timely. (*see Annex7 for field observations*)
- 83. There however are concerns especially relating to (i) adequacy of quality assurance in consolidation of the financial reports from the various sub basins at the respective nodal offices in the line departments and (ii) delays in reconciliation with AG by the agriculture department. This has delayed the commencement of audit for FY 2011-12 and has delayed the submission of the audit report beyond the due date of Sept 30, 2012.
- 84. The mission reiterates the previous recommendation of placing a finance personnel on contract basis in the nodal offices (IAMWARM cells) to support the finance unit in the various departments to address issues relating to timely reconciliations and review of sub basin monthly financial reports. In addition it was observed that the LOC facility for the expenditures of MDPU has been withdrawn by the Govt w.e.f April 1 2012. In view of the need for certain operational flexibility to the MDPU, GoTN may consider either restoring the LOC facility or provide a management fund imprest facility to the MDPU.

IX. Environmental Safeguards

- 85. The mission cleared the TORs for the external (third party) independent audit of the implementation of the environmental and social management framework for Phase 1 and 2 activities and would urge that the audit is undertaken urgently, as it is already delayed significantly. The mission interacted with the Environmental Cells of the Coimbatore and Chennai Divisions and reviewed the implementation of planned environmental activities. The mission interacted with farmers in the Coimbatore Division who are practicing organic farming. There seem to be good potential to upscale organic farming

approach under the project, however, the current inputs provided are counterproductive to this. There is also a greater need to provide more training and exposure visits to farmers to develop their confidence in going organic. Doubts on the yields, input costs and time and labor persist in a number of farmers. Also, it is generally not clear if smaller farm sizes provide a reasonable scale for adopting organic farming that is economically remunerative. Perhaps, the mission notices that while the awareness campaigns and development of herbal gardens are going on well, there is a need to improve on the reporting of some indicators that are impacted due to project interventions. *It was agreed that the ECD would include reporting on the following seven indicators in the next progress report* (or latest by December 31, 2012): (i) basin wide extent of wasteland as indicated in the wasteland atlas released by Government of India from time to time; (ii) soil quality; (iii) surface water quality; (iv) groundwater quality; (v) current siltation status as compared with pre-project situation; (vi) current extent of weed growth inside project tanks as compared with the figures provided in the DPR; and (vii) extent of use of fertilizers. The indicators are selected on the basis of either the measurement data for these are being collected by some line agency or already collected under the project. These would not require setting up of new data collection system.

86. The mission held detailed discussions with TNAU on measuring methane emissions under SRI and towards developing a methodology for submission to the CDM Executive Board. The mission advises carefully revisiting the projections made on gains achieved from methane reduction, as the current projects appear undervalued. The mission also provided guidance on the next steps for completing the methane emissions study. The entire exercise is to be undertaken in two separate stages. The first stage is contracting a consultant to help with preparing and submitting the methodology to the CDM Executive Board. Once the methodology is approved, the actual validation of the carbon credits can then be undertaken. The second stage of obtaining Certified Emission Reductions (CER) would have to be undertaken separately and only after the CDM Executive Board admits the respective project proposal that would be forwarded through the Designated National Operational Entity (DNOE), presently housed in the Ministry of Environment and Forests (MoEF). Following the registration of the project by the CDM Executive Board, an independent validation consultant would be contracted for certifying the CERs, which can then be sold/auctioned on existing markets. For now, the mission suggests that the first stage be completed urgently.
87. The mission also observed that the SRI targets are under achieved primarily due to involvement of labor, which is in short supply. To overcome the labor constraint, TNAU is in the process of developing a mechanized SRI planter. However, the planter is still a prototype. TNAU should explore collaboration with other institutions, including private vendors who could help completing the development of the planter. This could greatly improve the adoption of SRI, which had both economical and environmental benefits.

X. Procurement

88. The Bank has provided no objection to the procurement plans for 2012-13 of most of the implementing agencies in the project. No objection of the Bank for the procurement plan of WRD for Phase IV sub basins has already been provided on December 30, 2011. WRD is in the process of finalizing the procurement plan for 2012-13 for additional activities pertaining to the left over work of the sub basins of Phase I and II. This procurement plan for 2012-13 for additional activities will be sent to the Bank for review and clearance by September 30, 2012. The procurement plan of Horticulture Department which was cleared by the Bank earlier is being further revised and the General Manager IAMWARM Cell Horticulture Department discussed the revisions and mentioned that the revised procurement plan (by adding 4 packages of Ongur sub basin) will be sent to the Bank for no objection within a week. Similarly, the procurement plan of Agriculture Engineering

Department which was cleared by the Bank earlier is also being revised in the light of the discussions held during the supervision mission regarding extension of underground pipeline up to the tail end of Ayacut of Jeevanur Tank in Varahanadhi sub basin and also a few more packages for Farm Pond and Rain Water Harvesting Structures. The procurement plans of Animal Husbandry Department and Agri Marketing Department are under technical review at the Bank and Bank's response is likely to be sent to the project within a week.

89. The draft ICB bidding document for procurement of computers and peripherals (estimated cost Rs 193 lakh) for WRD was discussed with the staff of MDPU, Executive Engineer/ IT Cell/ E-in-C office and the General Manager of ELCOT (the procurement agent for IT equipment for TNIAMWARM project). Several inconsistencies, inaccuracies and typographical errors were pointed out and it was agreed that the revised draft bidding document will be sent to the Bank (through MDPU) for review within two weeks.
90. The draft RFP for selection of support organization for capacity building of WUAs (Package no. 12) was discussed in detail. It was observed by the mission that the short lists for the 16 packages for support organization (Package 11 to 26) were prepared on the basis of EOIs which were received more than 27 months ago. It is doubtful if the firms on the short lists (who submitted their EOIs more than 27 months ago) would still be interested in the assignment and would submit their proposals. The Project Director mentioned that the PIM cell of E-in-C would write to these firms and find out if they are still interested in the assignment and based on the response of the firms, next course of action would be decided. The Bank has a few minor comments on the draft RFP which have been discussed with the MDPU staff for incorporating in the draft RFP.
91. The case regarding procurement of LAN & UPS to WRD offices – Package No.22/IAMWARM/ICB/ WRO/ LAN/06-07 was discussed. The contract value in this case has increased by more than 15% (19.9% more than the original contract value) and the project has requested Bank's no objection for the same. This contract involved 142 offices scattered all over the state and most of the increase appears to be due to increased quantities of multi strand power cables, cable laying conduits and switches, etc. It was agreed that a committee of three officers (one from MDPU, one from electrical wing of PWD, and one from IT cell) shall visit a few offices to verify the actual quantities used as compared to the quantities originally planned in order to ascertain if the increase in contract cost is reasonable. The committee shall submit their report within 10 days and send it to the Bank. Further course of action shall be decided on the basis of the report of the committee.

IX – Next Steps

92. The next implementation support mission is tentatively scheduled for the latter half of January. In addition, individual members of the Bank task team may be requesting short visits to the Project between missions to follow up on specific activities as agreed with the MDPU. The summary of key agreed actions is contained in Annex 1.

Annex 1 -- Key Agreed Actions

S.No	Actions	Date by	Responsibility
1	Strengthen contract management for civil works for Phase 4	Immediate (underway)	WRD, Regional CEs
2	Third Party Quality Control Consultant to begin monitoring of Amaravathi Sub-basin works	Sept. 25, 2012 (underway)	WRD
3	E-in-C to put in place counterpart team to work with EIMS Consultant	Sept. 30, 2012 (delayed)	WRD
4	Revised draft bidding documents for computers and peripherals for WRD submitted to the Bank for review	Sept. 30, 2012 (Oct. 31, 2012)	MDPU
5	DPR for CG value addition investments submitted to the Bank for review	Sept. 30, 2012 (delayed)	DoAM, MDPU
6	Proposal for establishment of DFCs submitted to the Bank for review	Sept. 30, 2012 (Oct. 31, 2012)	DoAM, MDPU
7	TORs for PIM support staff submitted to the Bank for review	Nov. 1, 2012	MDPU
8	Plan for scaling up convergence and strengthening of line department implementation capacity, including training requirements, additional staffing, and other expenditures submitted to the Bank for review	Nov. 15, 2012	MDPU
9	FM staff to conduct field visits to sub basins	From Oct, 2012	MDPU
10	Send communication to Directorate of Treasury on payment practice in Thirutheni sub treasury	Oct. 31, 2012	MDPU
11	Award contract for internal audit	Nov. 30, 2012	MDPU
12	Crop budget analysis of SRI in South Vellar Sub-basin provided to the Bank	Mid-Nov. 2012	TNAU, MDPU
13	Contract accounts staff for nodal offices especially agriculture to facilitate timely reconciliation and improve quality of consolidation	Nov. 30, 2012	MDPU
14	Provide refresher training on financial reporting & quality assurance to sub basin & nodal office staff	Nov. 30, 2012	MDPU
15	Reporting on select environmental indicators in the next Environment and Social Impact Monitoring report	Dec. 31, 2012	MDPU
16	Training for 50 PIM WRO staff completed	Dec. 31, 2012	MDPU
17	Cost-benefit analysis of major fisheries interventions provided to the Bank	Dec. 31, 2012	DoF, MDPU
18	Study of CGs and ABCs submitted to the Bank	Dec. 31, 2012	DoAM, MDPU
19	Training of staff in tilapia seed production and fish culture in cages carried out	Dec. 31, 2012	DoF, MDPU

Annex 2 -- Observations on progress under Component A

1. *Implementation of newly included Amravathi sub basin works.* All 22 packages of the rehabilitation works in Amravathi sub basin have been awarded in phases during the period, June to July, 2012 and the works have also commenced. This is an encouraging feature. The mission visited 11 packages out of which 8 packages related to the placement of cement concrete lining in the canal system. Rehabilitation of Amravathi Main Canal from km 0.00 to km 12.50 (Package no. 1) and rehabilitation of Left Main Canal from km 0.00 to km 8.10 of PalarPorundalar System (Package no.13) involving mechanized placement of bed lining constitute major packages worth Rs. 40 crores. Working period available for execution of works in these packages as well as in all other packages involving placement of canal lining is governed by the canal closure periods. Presently, the progress is slow since the contractors have not mobilized and deployed the requisitely needed critical construction equipment specified in Section I, Clause 4.5 B (a) of the Contract Agreements. As for example, the contractor handling the rehabilitation works in Amravathi Main Canal, km 0.00 to km 12.5 has deployed only 1 Concrete Paver for placement of bed lining against 3 Pavers specified in the Contract Agreement. Likewise is the position in respect of the backup equipment. Only 1 self loading-weigh batching & mixing and transporting mixer has been deployed against 2 such mixers specified in Agreement. In addition, he had to also commission one batching & mixing plant for this work. Similar is the case in respect of Package no. 13 relating to the rehabilitation of Left Main Canal from km 0.000 to km 8.1000 of PalarPorundalar System The contractor was required to deploy 2 Concrete Pavers and 2 self loading, weigh batching & mixing and transporting mixers as per the Contract Agreement but he has still to mobilize these machines. In order to accelerate the implementation progress, it is essential that the contract management should be strengthened by the Regional Chief Engineers and timely deployment of critical and major construction equipment specified in the Contract Agreements is ensured by the contractors. Furthermore, as per the Contract Agreement, the contractors are required to submit construction program of works within 14 days of delivery of the letter of acceptance. The mission noted that this requirement was also not being fulfilled and, consequently, no meaningful monitoring of implementation of works is being done by the field engineers. Strengthening of contract management, as suggested above, also applies to all packages involving lining of distributaries through deployment of slip form steel gantries.
2. *Measuring Devices and Lining of Irrigation Channels in Phase III and Phase IV works.* The mission during field visits to the tank systems rehabilitated / being rehabilitated noted that the lining of irrigation channels (in a short reach downstream of irrigation sluices) and construction of measuring devices had not been taken up so far except in an isolated case or so. These works should now be taken up on priority basis. A measuring device (V-Notch) was observed to have been provided in the lined field channel in one package no. 5 in Madurai region. The construction does not conform to the drawing of V-Notch issued by the Engineer-in-Chief and enclosed in some Bid Documents. It is suggested that the Engineer-in-Chief should issue a circular as well as the drawing of V-Notch directing all field engineers to construct the measuring devices correctly. Any change in design should be done in consultation with Chief Engineer, Designs.
3. *Turfing on rear slopes of tank bunds.* The mission observed during field visits to Phase III and Phase IV tanks that turfing was being provided only in short reaches of rear slopes upstream and downstream of irrigation sluices. It is essential to provide turfing on the entire rear slope of tank bunds to prevent erosion during rains.
4. *Construction Quality Control / Quality Assurance. Tank Systems.* The mission made field visits to 3 Phase IV tanks in Amravathi sub basin, 1 Phase IV tank & 5 Phase III tanks in Madurai

region and 3 Phase III tanks in Chennai region. It was satisfying to observe that mechanized compaction of earth fill in the bund section and that on the side slopes had been done / being done through deployment of power rollers and plate fixtures attached to the hydraulic excavators respectively. The density tests were being conducted by both the field engineers and quality control engineers and documented. The Third Party Construction Quality Management Consultancy was also conducting independent tests which indicated compaction having been done to acceptable criteria. It was encouraging to observe successful deployment of Nuclear Density Tester for conducting rapid on-site density tests and the mission got one such sample test done on each of the three Phase IV tanks in Amravathi sub basin. The requisite quality control tests on materials, soil, concrete etc were also being conducted by the project engineers and the Third Party Consultancy.

5. **Canal Lining Works in Amravathi Sub Basin.** Mechanized placement of cement concrete lining in canal bed through concrete paver is in progress in Amravathi main canal, km 0.00 – 12.50. It is for the first time that mechanized canal lining has been undertaken in Tamil Nadu. The quality of high speed lining conformed to acceptable standard. Good water-curing arrangement for the lining was observed to be in place.
6. In respect of the concrete lining being placed manually in the various distributaries, preparation of sub grade, placement and consolidation of lining and water-curing of lining were observed to be of satisfactory quality standard. Mechanized placement of lining on side slopes of distributary through deployment of slip form steel gantry has also been taken up in Package No. 4 for achieving more progress and better quality. It is for the first time in Tamil Nadu that slip form steel gantry is being deployed for placement of lining in small section channels. More such gantries are planned to be introduced by the contractors to speed up progress.
7. ***High Strength Concrete Design Mix; Use of Mineral & Chemical Admixtures.*** Package No. 13 in the Amravathi sub basin (Rehabilitation of Left Main Canal from km 0.00 to km 8.10 of PalarPorundalar System) involves construction of 3.10 km long reinforced concrete trough in M25 grade concrete. Use of mineral and chemical admixtures in the production of high strength concrete mix would be essential for the long-term durability of concrete structure. It is suggested that a batch of 25 engineers, including engineers from the central quality control laboratories, be deputed to a reputed institution such as National Council of Cement and Building Materials, Ballabgarh to receive training on the design of high strength concrete mixes through usage of mineral and chemical admixtures.

Annex 3 – Detailed Observations on Fisheries Activities

1 Majority of the interventions of the Fisheries component are getting stabilized and integrated with the farming activities of farmers. This is supported with some of results of the sustainability studies undertaken by the Department and the sample farmers visited during the mission. This effort of the Department is much appreciated and staff involved in field have made their best contribution by coping with various situations. In order to demonstrate evidence to produce 22,000 tonnes of fish at the end of the project period, by taking the current level of production as reported by the department at 6300 tonnes , this report would focus mainly on ways to reach that target in the limited span of time left in the project life. In the first part , briefly progress accomplished in the on-going programs is presented .

On-going programs:

2 Fish culture in farm ponds has made good progress and indicated target would be accomplished. There are several good farmers who have best used the farm ponds, not only to produce fish, but integrate the pond with various other horticultural crops and animal husbandry component on the pond bundhs. However, success is not common in all cases and the Department staff need to recognise this existing difference and make an effort to understand the reasons for this difference and use the lessons learned for scaling up the activity. In the previous missions suggestions have been made to prepare a data base of all ponds with owner's mobile connectivity and provide follow up support to these farmers. However, this has not yet become reality in all areas. Project Management Team in the Central Office need to recognise this opportunity and accomplish this suggestion on priority.

3 Similarly Fish seed nursing in cages is a very significant accomplishment of the Department, but due to lack of good documentation and publicity, natural scaling up of this activity by farmers themselves in Tamil Nadu or its impact in other parts of the country is not seen. In order to have good benefit of this program – project should make an effort to build complete data base of all farmers and make an analysis of results and publish the synthesis within the State as well as in various magazines to enable others to test and benefit from the technology.

4 Ongoing tilapia culture in cages in Dharmapuri district is a very good beginning in the right direction. Fishermen associated with the technology are keen on continuing the activity. It is suggested that the revenue likely to be generated from the existing fish crop be given to the group to continue the activity beyond project phase by using the amount as a revolving fund. Concerned Officers of the Department be made responsible to monitor the activity and provide continued support to improve fish culture technology in cages. For the next crop, quality seed can be procured from the hatcheries producing monosex tilapia in Andhra Pradesh and trials can be undertaken using quality seed. The present method of collecting large size fingerling from reservoirs is also a good effort, but care may be taken to select males to help farmers get better production and avoid other problems. Department Officers intend to visit the hatchery during this month and necessary support would be provided to organize the visit.

5 Two fish seed rearing in cement nurseries visited have made good progress. Most of these seed banks are still with the Department. Mordhana fish seed farm built completely under the IAMWARM project has been able to good progress with constraints farm is experiencing in terms of electricity and other difficulties. The seed produced by the farm is now stocked to reservoir, but the revenue realized from the harvest of fish in the reservoir is less than the value of seed stocked. It is suggested that instead of stocking seed in reservoir, these seeds may be used to stock in tanks. In order to improve the fish seed nursing operation, it is suggested that the additional facility like diesel operated air compressor be provided and training opportunity for the staff in seed nursing be provided in private farms of Andhra Pradesh. Such training can also be provided to all the leaders of the cement nurseries being operated by the Department and private farmers.

Annex 4– Detailed report of observations made during the field visit on livestock

1 The mission visited 14 villages located in 9 sub basins of the southern part of Tamilnadu encompassing Madurai, Tirunelveli and Theni Districts. The team interacted with the members of WUA, beneficiary members, officials of the AHD and other line departments. We have also participated in one health cum infertility camps to observe the camp performance and views of the farmers.

2 Until the FY 2011-12, the project is being implemented in 49 sub basins. Animal Husbandry Department reports 100% achievement in all the proposed activities i.e. artificial insemination, fertility cum health care camps, estrous synchronization program, deworming of heifers, sheep and goats, fodder production, azolla demonstration, farmers' exposure visits and farmers' interactive meetings. In terms of technical parameters (for FY 2010-11) the project is achieving a conception rate of 55%, calving rate of 53% and an annual growth rate in milk production to the tune of 5%. The present increase in estimated milk production compared with the beginning of the project (2007-08) is around 460 M tons. The reported cumulative female calf production till the FY 2010-11 is 236,231. Considering 10% calf mortality and 5% adult mortality, these calves will become lactating cows and at the end of the project there will be 200,847 lactating animals available in the project area from the AI performed till 2010-11. Against the total target of 166,000 female calves, the present project achievement stands at 121%. The cumulative financial utilization up to the FY 2011-12 is 88% against the targeted outlay of 295.1 million INR.

3 The field visit, feedback from the farmers and cross verification of the activities in few sampled villages gave an impression that the AHD gained a niche among the farmers and even among the other implementing departments due to their constant visit to the project villages in order to follow the various components of the project activities. The impacts are visible and many farmers with whom we have interacted acknowledged the impacts. Many farmers who started diversifying more and more into dairying and other livestock activities expressed their appreciation for the regular visit of the AHD officials, their continued interaction, timely provision of services and periodical follow up as motivating factors and confidence building forces for their adoption. The AHD officials working in the project villages overwhelmingly acknowledges the impact due to their continuous presence, interaction in the villages and timely availability of quality seed materials, feed supplements, and veterinary medicines, financial support for executing camps and incentives which were made available through IAMWARM project. But the lacuna is non-availability of documentation and data to substantiate the impacts.

4 On a more positive note, the various livestock development activities implemented under the IAMWARM project has become a model for the Government of TN to replicate their livestock development programs on a large scale. Fodder development program is one such program planned by the TN government. There is a realization among the different line departments like Agriculture, Fisheries, Horticulture, Agri. University, Agri. Engineering and Agri. marketing, etc., how efficiently they could come together and develop a coordinated plan for implementing different agriculture based programs. Our visit to Thenpalanzi village near Madurai, where the convergence and SWIC (Single Window Information Centre) activities are carried out gave a testimony for the combined working. Farmers were happy because every day at least one official from any one of the line department visit the villages under SWIC and the problems are immediately addressed or guidance is given where to contact for the required advice. The department officials are enthusiastic because they could see the results for their efforts.

Breeding Program:

5 The targeted numbers of artificial inseminations were achieved and the technical targets like conception rate and calving rates were also to the levels prescribed. It was understood that the targets supposed to be achieved through the WUA veterinary units also being achieved by the concerned

government veterinary dispensaries and hospitals due to the non-availability of veterinarians in the sub basin veterinary units. Although the targets are achieved, farmers from the villages where the AI service were available at their doorstep through these WUA veterinary units are faced with hardships in getting these services. Technically, provision of services at the farmers' doorstep has many advantages in terms of reduced stress to the animal and timely AI which could improve reproductive performance. In addition, the labor saving for the farmer could compensate the additional cost to be paid by the farmer. Out of the 70 WUA veterinary centres, only 3 centres have veterinarians working. It is important to renew these services either through appointment of veterinarians or posting paravets / trained AI technicians. Provision of AI services through trained AI technicians working well in many states including Tamilnadu, by which the breeding coverage has improved significantly. IAMWARM project also need to think on those lines and establish these services on self- sustainable basis.

6 The methodology for the calculation of technical parameters to be standardized as per the system followed throughout India, so as to have a better comparison. The conception rate of around 55% mentioned in the achievement is the number of animals conceived out of the animals verified for pregnancy (after 3 months of AI performed). In this case the norm is around 70% and considering this the achievement is below average levels. As followed all over India, a simple system like number of animals conceived out of the total AI done in a particular month will give a comparable figure. Or the project could follow the international system of number of AI required per pregnancy. The acceptable figure for this system is 2-2.5 AI per pregnancy. The same applies to calving rate also. A minimum of 70% of pregnancies should result in calving. The project is achieving a calving rate of 53%. Further, these claims need to be validated by experts from veterinary research institute. In the same way the estimated milk production increase of 26% (5% per annum) from the base year (2007-08) need to have supporting data and a reliable scientific methodology for estimation. The supporting data for the technical parameters need to be collected through proper sampling and validated recording methods.

Infertility and health care camps:

7 Infertility camps by and large a success and it benefited many farmers who were losing money out of the unproductive animals. The newly introduced estrous synchronization program is a more beneficial program as claimed by the farmers. The 80-90 % success rate of the estrous synchronization and fertility care camps created a confidence among the farmers and acted as an important factor to develop mutual relationship between the AHD officials and the farmers in the villages. Few of the farmers we had interacted were happy to see that their animals could get pregnant out of this intervention and prevented them from going for a loss making sale of their animals. Even few farmers have been saved from exiting keeping dairy animals due to non-pregnant status of their cows. Veterinarians have voiced their satisfaction on the quality of medicines and hormones supplied through IAMWARM project against the medicine supplied though the regular Govt. programs. The quality medicines enabled them to provide better services to the farmers.

8 The project could think of allocating more resources for fertility care camps as it will save the farmer from huge economic losses. In addition to that, in states like Tamilnadu, where the indigenous cattle population is getting replaced more and more by crossbred population and AI as the widely adopted breeding method, the problem of infertility is going to crop up. It is a suggestion to provide mineral supplements for infertile animals in the form of mineral concentrated boluses than in the powder form, because the farmers may tend to use it for all his animals rather than using it for only the problematic animals. While implementing the estrous synchronization and infertility program care should be taken how best the hormones and medicines are provided mostly to the needy poor farmers who cannot afford to buy these medicines. A system to be developed to capture the information on the percentage of small/marginal/landless /below poverty line (BPL) farmers have benefited out of this program. The veterinarians involved with the project need to be given more field based trainings and knowledge updating in the area of advanced reproductive management programs.

Deworming of calves, sheep and goat:

9 The deworming activity is carried to 100% levels as per the targets. It may be useful to design a region specific rotational deworming practice as per the parasitic load prevailing in the specific area. This could be developed in consultation with the Tamilnadu Veterinary Research Institutes spread out in the districts. Further the effect of the deworming practice should be documented through collection of appropriate data. Indicators like reduction in fecal parasitic egg count, reduction in calf, sheep and goat mortality, decrease in age at first calving in heifers, increase in growth rates in sheep and goats could be collected on a periodic manner and an analysis should be done on the impacts of the deworming. The Animal health cards given to the farmers should be used to capture this information.

WUA veterinary units:

10 Out of the 70 WUA veterinary units, only 3 units are having the veterinarians for providing veterinary and breeding services in their nearby villages. The farmers are suddenly deprived of the established services which were a boon to enhance their livestock production. Although the nearby government veterinary institutions cater to the needs of these villages, the farmers are forced to walk for 6-7 kms with their animals. Besides practical difficulties, they also lose a day wage. As stated earlier, the difficulties are pronounced in availing AI services. So, a critical consideration should be given to fill up these posts with veterinarians or trained paravets / AI technicians who can provide AI and basic animal health care services under the supervision of the nearby government veterinarian.

11 The breeding and veterinary input services are one of the important input interventions for the growing crossbred cattle population which are high value and high risk assets in the hands of the farmers. As we have seen in Allinagaram Municipal area in the Theni district, the small dairy units have become a livelihood source for the poor women and landless labourers who are socio economically deprived section in the society. From the discussions, we understood that the important motivating force for these poor communities to adopt dairying is the availability of veterinary and breeding services in their nearby vicinity. According to them the men goes out for the daily wage labour in the town area and the women take care of the cows. By this way the women get employment and also able to earn for a decent living, besides ensuring availability of milk in their house which otherwise is costly to purchase.

Animal nutrition intervention programs:

12 Fodder production has played an important role in executing the other programs much efficiently, because nutrition plays a base for overall animal production. Many small farmers have been assisted through fodder production and almost half of the farmers continue to maintain these fields. In many places the fodder production got extended to other farmers in the villages through the supply of seed materials (fodder slips) produced from the beneficiary farmers. However, in few places we could observe that large farmers have been given seed materials in large quantities which could have been utilized for covering large numbers of small farmers who have problems in purchasing the seed materials on cost. A system to document what is the percentage of small and marginal farmers have been assisted through the program needs to be developed. Also, a clear documentation on the increase in land area under fodder cultivation and quantum increase is hard to find with the project officials. This is essential to plan for future fodder development programs for the available livestock in the villages.

13 Now every sub basin and their respective project villages have well developed dairy, sheep and goat units with a set of good livestock management practices. These farm units should be identified as farmers' field schools for importing training and exposure visits to the farmers of adjoining villages. Cost effective farmers training programs could be organized using these units rather than mere theoretical sessions presently followed in the farmers' training programs.

Azolla demonstration programs do not seem to penetrate the farming community. Few farmers who were provided with inputs keep maintaining the tanks that too for few months. The reasons quoted for non-adoption is death of seed culture after few months. Continuous follow up on the culture practices of the farmers on continuing basis may improve the adoption and success level among the farmers. Otherwise the program may not produce the desired outcome. Also there is a need to analyze and document the reason for failure for future technology improvement.

14 Chaff cutters have been provided as demonstration units in few of the project villages. This machinery was distributed at 75% subsidy mainly to big farmers having more than 10-15 animals with a thinking that they will demonstrate this to other small farmers who will get motivation for purchasing the chaff cutters. But we could not see any impact (such as demonstration programs for small farmers and other small farmers adopting this machinery) of this activity. Small farmers with 2-3 animals hardly will be able to get the full utility of these machines even if they buy. It is true that chopping the fodder improves fodder utilization and wastage, but alternate adoptable methods need to be worked out. This program is benefiting few commercial farmers who otherwise have the financial capacity to buy these machines on their own. This activity requires re consideration and the financial resources could be used for wide reaching program like deworming, infertility and health care camps. One unit cost of the chaff cutter probably could be used to purchase medicines and hormones for 2 health care and infertility camps.

15 Provision of salt licks to the calves is appreciated among the farmers and they could see the effects like reduced calf mortality, improved growth rate of the calves and early maturity. Again how much of these benefits are reaching to the poor farmers need documentation. The effects visible in big and commercial farms should be shown to the small farmers and their adoption should be documented. Also thought should be given how to sustain this activity at the end of the project period (like making available the salt licks in the villages at an affordable cost).

Sheep and Goat marketing:

16 Development of formal / informal farmers' groups for marketing of live animals and providing them with market information and basic infrastructure like weighing balance could be considered for marketing of sheep and goats (live animals), which is otherwise exploited by middlemen. This could be taken up on a pilot basis (at least one such unit for few sub basins on a pilot basis). It could be preferably collaborated with agriculture marketing board to establish and provide market information on livestock commodities. Providing infrastructure like weighing scale will create transparency in purchase of live animals and correct information will give the farmers a proper pricing strategy. The middlemen usually buys live animal on a guessed body weight. If one kg body weight is under weighed, the farmer will lose an amount of Rs.200-300, which is equivalent to 3-4 days wage. Our intervention programs such as deworming and vaccination helps to improve the sheep and goat sector. But to realize the benefits, an appropriate market mechanism could be developed as a pulling factor for this sector.

MIS:

17 Data management system to capture the impacts and validation of technical parameters, and adoption of scientific methods to collect information related to the impacts (such as milk production) should be executed at the earliest. Proper statistical models to be used to estimate the milk production increase in the project area.

Capacity building:

18 The project implementing staff needs more orientation in planning for breeding programs and mating plans (breeding policies) in respect to their production systems. In addition, their capacity needs to

be strengthened in modern practices of handling infertility problems and modern reproductive management, and result based project monitoring methods.

Activities to be carried out with a timeframe:

<u>Activity</u>	<u>Time frame</u>
1. Filling up of vacant posts in WUA units –with Vets or AI technicians	March 2013
2. Data management system / data capture/ validation	March 2013
3. Analysis of azolla non-adoption	June 2013
4. Identification/establishing Farmers' field schools	March 2013
5. 2 pilot sheep & goat marketing units	June 2013
6. Training on infertility management (field based) for Vets	June 2013

6 Fish Seed rearing in pens is reported to be a good success. However, supporting data and other documentary evidences to show the quantum of success is missing. It is essential that project follow up the work during this year and provide support to fishers or farmers to whom these pens have been provided and record the results. Monitors provided may be used to provide support and document the activity. Pen rearing is one of the potential activities that can be undertaken even in small reservoirs where water is present at least in deep portions of the area.

7 Ornamental fish culture has seen success with the change of strategy of building earthen ponds instead of small cement tanks. As there are several farmers already engaged in earthen pond rearing of aquarium fish seed, in areas where success is yet to be seen, organizing field visits to such farmers would be useful.

8 Fish culture in irrigation tanks is an activity that needs closer focus in the remaining phase of the project. While stocking of these tanks is undertaken, monitoring of production data remains poor. As several of the tanks are being repaired, tank fish culture is the most potential activity in Tamil Nadu to increase fish production. In order to address the policy issues encountered in tank fish culture, it is essential that this project should demonstrate the fish culture potential in tanks as that would help in optimal utility of the water resource.

9 Kiosks have been a good success in most places and in some locations they have proved to be an excellent initiative. Suggestions made in the past to promote fish as health food information is to be implemented. Fisheries College and Research Institute in Thoothukudi has produced a brochure on fish as health food and this can be multiplied and distributed through kiosks. There is also a website and from this site wealth of new information being generated can be downloaded. www.gillseafood.com and this “Global Initiative for Life and leadership through Seafood” has been started with TANUVAS as one of the partners. Under the NADP project, a new project to provide people with information on fish as health food has also been started. These may be taken advantage to promote these kiosks and provision of necessary information to people.

10 There is an urgent need for the project to organize all the 26 units established under the project centralized entrepreneurship programs for these units. In areas where the business from sale of fish alone is not adequate to sustain them, these units may be allowed to sell other meat products.

Provision of fishing implements has been accomplished, but tracking their impact would be useful.

Challenges to be addressed

i. Increasing fish seed availability through establishment of earthen seed banks

In order to have adequate seed of appropriate size, provision has been made in the additional DPR , to create 100 earthen fish seed nurseries. This is a large target to be accomplished in a short span of time. Identification of appropriate area and farmers is key. Cluster approach may be adopted in order to facilitate the process of seed procurement by the interested parties and facilitate easy transportation. Water availability is the key criteria that need to be recognised for identification of areas for location of these nurseries. Further, to create these nurseries in various locations, support of Engineering division is essential. This may be taken up on highest priority with the provision of manpower needed to monitor quality of construction and implementation.

ii. Seed production centres

In order to provide necessary seed for nursing, four fish breeding and seed production centres have been envisaged. With the experience already available in the Department, adequate care may be taken to select these four potential seed production centres and they need to be located in such areas by which nursing farmers can procure early stage seed from these centres.

iii. Fish seed nursing in earthen ponds , cages and hapas

As the seed nursing units alone will not be able to provide large size seed, seed nursing in earthen ponds, hapas and cages are proposed. While hapa nursing is a technology with which Department has confidence, seed nursing in ponds and cages are new introductions and need necessary adaptations. However, if care is taken in the selection of farmers and provide training to them, they would play key role in increasing fish production by supplying quality seed.

iv. Training of staff and farmers in tilapia seed production and cage farming technology

While carps form main stay in increasing production, tilapia culture would be best suited for all scales and for all types of farmers. Hence, seed production facilities have been proposed to be created under the project. To avoid further delay, staff training as envisaged may be taken up on high priority. Before the facility construction is started, it would be useful for the staff to undergo training and ensure creation of good facilities. Asian Institute of technology in Thailand has structured program in tilapia seed production training and Bogor Agriculture University in Indonesia would facilitate training on cage culture. These trainings are proposed for six weeks with three staff for each component. This is long pending proposal and with the availability of resources in the Additional DPR, this may be taken up on priority.

v. Strengthening of documentation and communication

As the project is already in the advanced stage, it is essential that this aspect is given high priority. Monitors provided in the project need to be best used for this purpose and this should be accomplished in the next three months. Adequate provision of support staff and material has been made, but there is need for leadership support and coordination from the central unit to ensure good outcome. Besides publishing in various magazines and events, information may be made available electronically. By strengthening the IAMWARM cell, this issue can be addressed.

vi. Monitors appointment

Government has given permission for the appointment of Monitors. The recruitment process may be hastened and the appointed Monitors should be utilized exclusively for IAMWARM work and work should be carefully monitored by the IAMWARM cell in Head Office and Nodal Officers concerned. Additional DPR also provides space for appointment of some Monitors and it is essential that these staff are best used in providing support to project activities, documentation and analysis and reporting of results.

vii. Selection of staff for training on tilapia seed production and cage culture of fishes

It is essential that careful selection of staff is made to undergo training in the area of tilapia seed production and cage culture of fishes with a condition that they remain in the trained area of activity at least for a period of three years. This minimum period would help them to demonstrate the activity.

viii. Amur carp breeding centre

The stock brought from Bangalore has been built and large numbers of seed have also been produced. However , it is necessary that the stock is shifted to the identified Poondi Fish farm , located near Poondi reservoir and the centre be developed as Amur carp breeding centre. Staff responsible for management of this centre may please be sent to Karnataka Veterinary and Fisheries University, Fisheries Centre in Bangalore and they have agreed to give them practical training on breeding and management of the stock in December, 2012.

ix. Cage nursing of fish seed

This is a new area that can be explored to address the seed shortage. Few cages may be set up on experimental basis in some of the reservoirs, particularly using the dead storage area for early nursing of seed . Besides conducting trials on stage, late fry may be used for large scale nursing and this component may be taken up using the savings for large scale experimentation.

Conclusion

Activities stabilization is seen in all the interventions, but the evidences to demonstrate sustainability are scanty because of the lack of effort in capturing field realities. This is an area that requires attention. In addition, the activities that need to be implemented in rest of the project period being large, it is essential that adequate dedicated staff for the project implementation are provided. Producing more than six crore fingerlings and stocking them in various tanks is a major challenge. However, it is also an excellent opportunity to demonstrate the capability to accomplish this task through coordinated efforts.

Annex 5 – Information & Communication Technologies

1 Enterprise Information Management System (EIMS)– The EIMS is a web based decision support system that will support WRO in effective water service delivery. ELCOT was hired as the technical advisor and TechMahindra has been contracted to design & develop the EIMS. The EIMS contract was signed on October 31, 2009 and Tech Mahindra tried to customize GEMS software to Tamil Nadu. This did not work and EIMS design reverted back to the classical approach. TechMahindra is currently involved in documenting AS-IS processes, re-engineering these into “TO-BE” activities and data categorization. The design is expected to take 6 months with software development, testing and roll-out expected to take another 12 months. The Inception Report was finalized in September 2012 but 900 processes need to be reviewed, worked upon & approved. The Mission is concerned that the EIMS would only be completed by the closing date of the project and discussed ways to accelerate the issues of delays in the EIMS consultancy and is concerned that the EIMS would only be completed by the closing date of the project. *The Mission recommends the following- (a)Engineer-in-Chief to put in place a counterpart team to work with the EIMS consultants by September 30, 2012 (b) the next 2-3 months are critical and a formal process needs to be put in place officially to expedite the approval process for AS-IS and TO-BE processes, and (c) the associated staffing to maintain the EIMS at the ELCOT data center should be determined and planned accordingly.*

2 GIS-enabled web based system for SWaRMA – SWaRMA has modified an earlier TOR for a consultancy to design, develop & install a GIS-enabled web based system for state water information. The SWaRMA team held technical discussions on this modified TOR with the Mission to seek clarifications prior to its transmittal officially to the Bank. The Mission supports the concept of a state-wide water management information system and stressed two principles – harmonization and strengthening existing institutions for this purpose. *The Mission recommends that SWaRMA should – (a) engage ELCOT as its technical advisor to assist with the TOR and liaise with the consultants when they are hired (b) split the TOR into two stages – (i) assessment of current systems & gap analysis, and (ii) design &development of the proposed GIS-enabled web based water information system (c) pilot the GIS-enabled system in two sub-basins that are different, and (d) consider hosting the system at IWS or the State Ground and Surface Water Resource data Center (SG&SWRDC) to encourage harmonization and strengthening existing institutions.*

3 Leveraging ICT in the IAMWARM project– During the last few years, ICT has been a major driver for growth and mobile phones are increasingly widespread – even in rural areas. IAMWARM could benefit from the increased use of ICT in various project activities. India is expected to increasingly leverage ICT in its development work to transform agriculture & water sector work. The explosive growth of the mobile phone platform (70% of Indians have access to a mobile phone now) entails that IAMWARM should embrace ICT to support and transform all project activities. Unlike the past, where ICT was mainly used for project monitoring (MIS & FMS) – the future could use ICT in all project activities. Some examples of proposed ICT could be – (a) mobile money as a potential channel for payments (b) Tablets &mobile phones for remote supervision, engineering verification and functionality (c) leveraging mobile phone usage for accountability (d) use of ICT for data visualization and decision making on hand held devices (e) mobile phone platform to increase rural livelihoods by providing market and weather and other related information, and (f) ICT & mobile phone platform to provide information on services and mapping for results. The rapid technological advances in the mobile phone platform, connectivity and Internet based technologies create a great opportunity for IAMWARM project to leverage its future information technology (IT) investment for a greater return in better management information, increased staff productivity and enhanced delivery of services to its

beneficiaries. The Mission noted the IAMWARM project could benefit from an overall ICT strategy that provides a roadmap to further leverage ICT in the project component work. Although it may appear to be late in the project, an ICT study can still add value on several fronts – (a) identification & piloting ICT innovative solutions, and (b) proposing a strategy for leverage ICT for support IAMWARM components using various new technologies over the next 2 years. *The Mission recommends that MDPU – (a) engage a consultant for 45 days to carry out a study on “leveraging ICT to benefit the integrated agricultural modernization agenda” in Tamil Nadu, and (b) explore the possibility of actually leveraging ICT innovative solutions during the remaining project period after the study.*

4 Harmonization on ICT initiatives—The Mission noted that multiple agencies are currently working on agriculture & water in Tamil Nadu. ICT has been leveraged extensively (albeit, in a fragmented manner) in the water sector in Tamil Nadu. Data visualization and analysis through the use of Geographic Information Systems (GIS) would be very useful to IAMWARM project and other agencies involved. GIS is the new buzzword and several agencies (MDPU, IWS, SWARMA, State Ground and Surface Water Resource data Center (SG&SWRDC), and TWAD Board are all currently using it in a variety of ways. However this use is often fragmented with duplication, different standards, work in silos and insufficient coordination leading to a less than optimal solution. The IAMWARM project would greatly benefit from a GIS-enabled system that could provide timely and required information about water availability, access and usage in the state – in one place. There is a need for convergence on web-based GIS, ICT systems and infrastructure. The Mission recommends IAMWARM explore the possibility of harmonization of ICT within the project at two levels – (a) *ICT systems – a state level nodal agency that captures all agricultural modernization & water information , and (b) ICT infrastructure – possibility of maintaining all this information in one data center with attendant savings on ICT hardware, software, licensing, maintenance & associated staffing.*

5 Computerized Project Monitoring Information System (PMIS) – The Mission noted that a computerized PMIS has recently been developed to address the issue of capturing project level M&E data. The newly developed PMIS is a web-based system and all data is expected to reside in a central database. While the PMIS is a physically central model, it will appear logically as a decentralized sub-basin based MIS – as each sub-basin or district will be owner of its data. Each sub-basin or district will be responsible for its own data entry and all modifications/deletions will be their responsibility.

6 e-Velanmai—Knowledge dissemination of agricultural information is a key activity in this project and e-Velanmai is an ICT based demand driven, participatory extension approach undertaken by TNAU to support this activity. E-Velanmai uses ICT to disseminate information about new agricultural technologies as well as provide agricultural extension information. Farmers become members paying a nominal annual fee of Rs 50-150 (depending upon their land holding size) and can avail of agricultural advice anytime. The IAMWARM project has supported upscaling of e-Velanmai in 19 irrigation project command areas of the state. It is a demand driven process initiated by the farmer who will seek specific technical advice pertaining to his agricultural situation. The TNAU presentation indicated that enrollment and usage of e-Velanmai services appear to be increasing.

Annex 7 – Financial Management Field Observations

1 **Agriculture Department:** The nodal office in agriculture department has taken the following actions to address the concerns identified in the previous mission: (i) training provided in financial reporting to sub basin staff; (ii) revised financial reports for FY 2011-12 (revised Form 2 & 2A) obtained from all sub basins based on reconciled expenditure with the respective treasuries; and (iii) details of pending AC bills obtained from sub basins as of March 31, 2012. However the overall reconciliation of the department's expenditure for FY 2011-12 has not yet been completed by the budget and reconciliation section (BRS) of the department thereby delaying the start of the project audit by the AG.

The MDPU has completed the following actions agreed in the previous mission (i) obtained details of retention money as of March 31 2012; (ii) followed up and settled the long pending advance of AH department with TNMSC; (iii) validating the expenditure reported by sub basins with the expenditure report of AG and following up on large variances; and (iv) completion of technical evaluation for selection of internal auditors. However refresher training to sub basin staff and field visit to sub basins could not be carried out by MDPU finance staff. It was agreed that the training would now be provided by November 2012 and monthly visit to sub basin would be commenced from Oct 2012. The mission also suggests that given the complex nature of the project with multiple departments and over 600 DDOs the finance specialist, currently on deputation from the treasury be retained in the MDPU.

2 **Field Visit observations:** A visit to Thiruvallar sub basin was carried out and the units of Agriculture, Horticulture, AED and TNAU were covered. The documentation related to receipt and distribution of agriculture inputs to farmers, reconciliation with treasury were found to be adequate. The observations noted include the following:

- a) **Agri. Engineering:** It was noted that the Thirutheni sub treasury, instead of issuing cheques in favour of the suppliers, is issuing a consolidated cheque (against bills submitted) in favour of AEE, who then issues individual cheques to suppliers. It was indicated that this practice is being followed due to inadequate supply of cheque books to sub- treasury. This present a control weakness and it is suggested that the MPDU follows up AED to determine the extent of this practice and communicates with the treasury to issue necessary instructions to the Thirutheni sub treasury to curtail this practice.
- b) **Horticulture:** there is a need to streamline the management of records. It was noted that the details of pending AC bills has not been reported to their nodal office.
- c) **TNAU:** it was noted that the bank reconciliation is not done on a monthly basis (due to lack of timely update of passbook by the banks) and use of multiple formats for monthly and six monthly financial reporting. It is suggested that internet access be obtained to view the bank statements and consolidate the reporting formats to one format (cash flow) format.

Annex 6 – Monitoring & Evaluation

1 Results Framework (RF)- The Mission noted that the results framework needs to be slightly refined to ensure that it captures relevant & measurable information that is aligned the Project Development Objective. The joint review and proposed refinement of the RF resulted in the replacement of 8 indicators with 1 new indicator and slight modification to 4 indicators. The indicators modified are – (i) % increase in area under diversified crops (Horticulture, SRI & other diversified crops) (ii) Number of targeted staff trained (iii) % increase in yield of crops (SRI, maize, groundnuts) & milk, and (iv) Number of WUAs setup & trained. The indicator added is – (i) Number of agro-advisories provided by e-Velanmai. The indicators dropped are – (i) increase in value of crop production per unit of irrigation water supply (ii) % of schemes completed within planned time and cost (iii) % increase in conveyance efficiency (iv) integration of the work of different line agencies for selected sub-basins (v) % increase in area covered by IPM/INM/Organic farming (vi) Number of market information kiosks (vii) Number of additional agricultural enterprises/value chains developed, and (viii) Basin Boards set up and strengthened for 4 additional basins. The proposed changes will not affect the development objective and overall outcome targets. The Mission will make the case for these refinements to Bank management to improve project reporting. *The Mission recommends that the MDPU – (a) furnish the baseline data & the current values for these key performance indicators, and (b) continue to capture and report on these refined Key Performance Indicators on a half yearly basis*

2 Baseline Report – The project has engaged SMEC to assist with the evaluation function – which includes the production of a Baseline Report, a mid-term evaluation as well an Impact Evaluation at the end of the project. The Baseline survey was undertaken in 2009-2010 and the Baseline Report was produced in September 2011. The Mission noted that the Baseline Report contains a wealth of information on project initiatives but lacks a clear Key Performance Indicators (KPI) table that specifies the initial baseline values needed for project reporting. The refinement of the Results Framework presents an opportunity for the project to align and add value to the Baseline Report. *The Mission recommends the following – (a) add a chapter to the Baseline Report dedicated exclusively to the KPI table with attendant figures (b) clearly spell out the definition of each KPI, and (c) specify the process of collecting or calculating each KPI in that chapter.*

3 Impact Evaluation – The Baseline survey was undertaken in 2009-2010 on Phase II & III activities whereas an interim mid-term survey was undertaken on Phase I activities a year later in 2010-2011. Due to the initial delay in engaging a M&E Agency to assist with the evaluation function, the subsequent surveys have not been well spaced out. The final Impact Evaluation survey is currently scheduled for March 2013 and will not be effective as it does not even give a gap of a year to assess impact. It is our understanding that GOI has requested a project extension of 18 months. *The proposed project extension of 18 months entails that the final impact evaluation survey and report will be pushed back accordingly by 18 months.*

4 Project Reports– The Mission noted that the project reporting is focused mainly on financial expenditures and physical outputs. Physical progress details are left to the lower levels and reporting is mainly confined to outputs. Currently, the project reports do not report on the Key Performance Indicators or place emphasis on the demand side of the project. Quarterly Reports are prepared by the MDPU for sharing with the government but the Bank receives half yearly reports only – as per the project design. Progress reports on cross cutting functions like IEC, M&E and Capacity building are limited and add little value except to specify numbers. *The Mission recommends that the project reports should – (a) contain a KPI table showing YTD and*

Cumulative progress (b) expand the reporting beyond mere output numbers by writing a few lines on what these numbers mean in terms of intermediate outcomes, and (c) note challenges and bottlenecks and how these were addressed or expect to be addressed.

5 Project Monitoring Information System (PMIS)- The project commissioned the development of a PMIS to leverage ICT to create a web-based system to capture monitoring data from all the implementing agencies into one system. It is our understanding that the PMIS has recently been completed and it is yet to be rolled out fully. The PMIS was perfunctorily reviewed and it needs to be modified to incorporate the changes in the “key performance indicators”. *The Mission recommends that the PMIS be – (a) modified to incorporate the refined indicators, (b) the central repository for all information needed for the project reporting, and (c) the source of all quantitative information detailed in future project reports. .*

6 Data Collection mechanism – Data is collected at the sub-basin level for by the SDO and Executive for time based contracts under Component A. Data is collected at the block level by the Agricultural Officer at the Block level for Component B. Data capture is currently done in EXCEL spreadsheets and a meeting is normally held at the Chief Engineer’s office on the 5th of every month to ensure that all requisite data for the project has been collected and is verified. The data is then sent upwards to the respective implementing agencies and a liaison meeting is held on the 9th of every month. At this stage, the MDPU is given the data to for preparation of reports. The newly developed web-based PMIS is expected to be a mechanism for data to be captured at various levels in the project.

7 Studies & Surveys –The Mission noted that studies pertaining to specific project components are under the purview of the associated implementing agencies. The following rapid assessments and studies are currently underway under the project – (a) Transformation of Tank Economy – case study (b) Agri Business Centre – case study (c) Evaluation of Agricultural Intervention in Palar – activities under Pulse mission (d) project Analysis and observations (e) Impact Analysis of IAMWARM project in Varahanadhi and Polney sub-basins (f) Rapid Assessment of 8 selected tanks, and (g) rapid Assessment of Horticulture and Agriculture Interventions. The M&E Agency (SMEC) has been commissioned to undertake all survey work for the project. The Mission noted that certain key performance indicators need to be captured on an annual basis by survey methods to update the KPI table. *The Mission recommends that MDPU consider extending the contract of the current M&E Agency to incorporate the additional tasks of the above annual surveys for KPI indicators capture & reporting – upon project extension..*

8 Participatory Monitoring–The Mission noted that there is little emphasis on participatory monitoring and citizen feedback on project initiatives and activities. The project could benefit from citizen feedback to improve their services from the massive investments in infrastructure and agricultural services being offered. Social Accountability approaches will bring about greater understanding between the service providers and the beneficiaries and leverage project benefits. In that context, the Mission would like to suggest that the project consider utilizing these approaches. Community Score Cards (CSC) is one such tool that could potentially be used to capture citizen feedback and satisfaction on service delivery, governance, IEC, etc. Normally, Community Score Card exercises are carried out in 10% of the project locations for different initiatives. *The Mission recommends that the project – (a) pilot the CSC exercise in 10% of the project initiatives in one or two sub-basins (b) gather information from the pilot, and (c) decide upon scaling it up at a later stage.*