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October 28, 2011

Mr. Debendranath Sarangi
Chief Secretary
Government of Tamil Nadu
Secretariat, Fort St. George
Chennai- 600 009
Tamil Nadu

Dear Mr. Sarangi:

Tamil Nadu Irrigated Agriculture Modernization and Water-Bodies Restoration and Management (IAMWARM) Project- Implementation Support Mission
September 12-20, 2011

We would like to thank the Multi-Disciplinary Project Unit and all the project counterparts who contributed to hosting the recent implementation support mission for the TN IAMWARM Project and for facilitating the extensive program of field travel. We would also like to thank you for your support of this important Project. Please find enclosed the Aide Memoire of the mission. While the Aide Memoire provides full detail on the work and results of the mission, we would like to summarize the main points here.

Project accomplishments: IAMWARM is one of the most ambitious projects in India with respect to linking improvements in irrigation canals and water bodies with improvements in farm productivity and farmer income. The Project has already accomplished a lot in this regard. Major accomplishments include the introduction of quality control procedures for tank and canal rehabilitation that have led to noticeable improvement in the quality of the construction work being carried out, broad expansion of demonstration and impact areas for testing and proving enhanced production technologies at the farm level, and promising approaches for linking farmers with markets to improve the prices they receive. The mission was impressed with the continued good performance of the participating line departments, and the yield and productivity increases that are being obtained. The mission also focused on ways to upscale the positive results that have been made thus far in agriculture marketing, and agreement was reached with our counterparts on strengthening the commercial aspects of this work and linking more actively with private sector partners.

Pace of implementation: One area of concern is the pace of implementation. Due in large part to the State elections in May, the Project has lost ground in the last 6 months with respect to the planned rate of implementation. With roughly 18 months remaining until the Closing Date, it appears unlikely that the project activities can be fully implemented within the allotted time. The MDPU provided to the mission a timeline for Project implementation for the remaining year and a half that is highly ambitious in comparison with the pace of implementation thus far. We will need to track actual performance against this timeline in the coming months and review this situation

ahead of the next implementation support mission that is currently scheduled for January 2012.

Use of Project savings: The Project has accumulated savings in a number of areas where the scale of project activities will be less than originally planned. These include the program of micro-irrigation systems and certain activities under the Institutional Modernization Component. One result of this mission is that agreement has been reached on the addition of the Amaravathy Sub-basin in the Cauvery Basin to the Project. Agreement has also been confirmed on the lining of head irrigation channels and the installation of flow measuring devices in Phase I and II sub-basins, where work has been carried out without these features. Together, these two additions will cover most of the foreseen Project savings. Room will remain for proposals from the participating line departments for additional activities of a relatively modest scale, but any such proposals will need to be finalized within the next 6 months. We kindly request that a restructuring proposal to utilize the savings and reflecting the agreements reached above be sent to us through the Department of Economic Affairs by November 30, 2011. This would not only ensure that all the activities envisioned in the revised scope are implemented in time, but also that the expenditure is fully accounted for and reimbursed by the Bank.

Institutional capacity building: Important progress was made during the mission on elaborating details of the program of training for the Water Users Associations (WUAs). The WUAs will play an important role in the increased efficiency of water use at the local level, and therefore will contribute directly to achievement of the developmental objectives of the Project. Agreement was reached during the mission on more substantial training for the Support Organizations for WUA development. Agreement was also reached on a program of targeted project-related training for Assistant and Junior Engineers in the sub-basins where WUA training will be ongoing and on measures to strengthen the PIM Cell in the MDPU, as well as the four regional PIM Cells. Taken together, these measures will increase the likelihood of improving the efficiency of water use at the local level. The mission was pleased with the progress that has been made in operationalizing the State Water Resources Management Agency (SWaRMA) and looks forward to the full functioning of this body in the near future.

Once again, thank you for your support of this important project. Please do not hesitate to contact Mr. Edward Cook (em: ecook@worldbank.org) for any clarification on this letter or the aide memoire attached.

With regards,

Sincerely yours,

Roberto Zagha
Country Director, India

Attachment: *Aide Memoire*

cc: Mr. Venu Rajamony, Joint Secretary (MI), Department of Economic Affairs, Ministry of Finance, Government of India
Ms. Kavita Prasad Director, Department of Economic Affairs, Ministry of Finance, Government of India
Mr. D.V.Singh, Secretary, Ministry of Water Resources, Government of India
Mr. G. Mohan, Special Secretary, Ministry of Water Resources, Government of India
Dr. V.V. Sadamate, Advisor, Planning Commission, Government of India

Dr. M. Saikumar, Secretary to Government Public Works Department, Government of Tamil Nadu
Mr. K. Arulmozhi, Secretary, Agriculture, Government of Tamil Nadu
Mr. Gangandeep Singh Bedi, Secretary Animal Husbandry and Fisheries, Government of Tamil Nadu
Mr. K. Shanmugam. Principal Secretary, Finance, Government of Tamil Nadu
Mr. Vibhu Nayar, Project Director, IAM WARM Project, Government of Tamil Nadu
Mr. Bisuvash Selvakumar, Engineer-in-Chief, Water resources Organization, Government of Tamil Nadu

AIDE MEMOIRE
TAMIL NADU IRRIGATED AGRICULTURE MODERNIZATION AND WATER-BODIES RESTORATION AND MANAGEMENT PROJECT (TN-IAMWARM) - IMPLEMENTATION SUPPORT MISSION (SEPTEMBER 12 -20, 2011)

Project Data		Current Ratings and Flag		
Board Approval Date	*01/23/2007*	*Summary Ratings*	*Last*	*Now*
Effectiveness Date	*04/09/2007*	*Development Objectives*	*S*	*S*
Closing Date	*03/31/2013*	*Implementation Progress*	*MS*	*MS*
MTR date- Actual	*03/05/2010*	*Project flags*	*None*	*None*
Original Loan Amount	*US$485 million*			
Amount Disbursed	*US$204.6 million*			

I- Introduction

1. A World Bank team[1] undertook an implementation support mission for the TN-IAMWARM project during September 12 to 20, 2011. The main objectives of the mission were to: (i) review proposals for the use of project savings, including the incorporation of additional sub-basins; (ii) agree on measures to accelerate the pace of implementation and disbursements; (iii) agree on measures to strengthen the capacity building program for the Water Users Associations (WUAs) and more effective water utilization at the community level; (iv) review the Quality Assurance mechanisms for tank improvement and other construction work; (v) review the activities of the participating line departments; (vi) assess the performance of the M&E aspects of the Project; and (vii) review budget and staffing plans for the State Water Resources Management Agency (SWaRMA). 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 extensive field visits that were carried out. The wrap-up meeting was held on September 20, 2011, and was chaired by Secretary, Finance. A draft copy of the Aide Memoire was discussed during the wrap-up meeting.

II- Main Implementation Issues

[1] The Team consisted of Edward Cook (TTL). Grahame Dixie (Agribusiness and Marketing Specialist), Ranu Sinha (Operations Analyst), Benjamin O'Brien (Agricultural Specialist), Dhirendra Kumar (Senior Procurement Specialist), R.K. Malhotra (Construction Quality Specialist), Anil Borwanker (Construction Quality Specialist), Mudnaku Nandeesha (Fisheries Specialist), and M. Swaminathan (Livestock Specialist). Anju Gaur (Water Resources Management Specialist), and Mohan Gopalakrishnan (Senior Financial Management Specialist) visited Tamil Nadu ahead of the main mission and their contributions are reflected in this Aide Memoire. Geeta Alex (Program Assistant) provided administrative support to the mission from the Bank's Delhi Office. Sebnem Sahin (consultant), who is undertaking a cross-State analysis of supervision of irrigation and tanks projects, participated in the mission as an observer.

2. **Pace of implementation.** The Project continues to make progress in key areas, though the overall pace of implementation has been slow since the last mission in February. Because of this, it is increasingly questionable that the Project will be able to fully disperse its funds by the Closing Date in 18 months, and could have substantial undisbursed funds at that time. The MDPU presented the mission with a timeline for completion of project implementation within the allotted time. The mission notes that this will require a significant acceleration in the long-term implementation pace for the Project. Progress against the proposed timeline will be tracked over the coming months. Concerning continued lags in project implementation and disbursements, the mission informed the MDPU and GoTN in the wrap up meeting that the Bank is taking a much stricter line with respect to extension of closing dates than it has in the past.

3. **Use of Project savings.** There are certain activities, particularly in Components B (Agricultural Intensification and Diversification) and C (Institutional Modernization of Irrigated Agriculture) that will not be implemented at the scale anticipated in the project design. With respect to the use of Project savings, MDPU has proposed additional activities as follows: (1) the addition of Amaravathy Sub-basin of the Cauvery Basin in Coimbatore Region to be included as part of Phase IV; and (2) lining of head irrigation channels and installation of flow measuring devices in Phase I and II sub-basins. The latter point has been discussed during previous missions and supported from the Bank's side. The mission also has no objection to the inclusion of the Amaravathy sub-basin. The estimated cost of these additional activities is Rs. 190 cr. With respect to these additional activities, the Bank cannot assume financing responsibilities for implementation activities which fall after the Closing Date. The mission also reviewed a number of other proposals from line departments under Component B for use of project savings. These are discussed in detail in this Aide Memoire.

4. **Monitoring and Evaluation.** Work of the M&E Consultant is moving forward. The draft Baseline has been completed and is due to be finalized this month. The draft Mid-Term Report (MTR) has been produced which covers a sample of Phase I tanks, where project interventions have been underway for three to four years, and for which a proper baseline could not be carried out. The mission discussed results of the draft MTR. It is in need of a quality check to clarify inconsistencies in data reporting. *A finalized version of this Report was to be ready by October 5*. The preliminary information in the MTR highlights issues on gap area, irrigation and cropping intensities, and diversification that will have to be followed up in the finalized Report as well as in future M&E Reporting. The mission reviewed a number of Impact Studies carried out by the M&E Consultant. While in the early stages of implementation of this assignment, a rapid assessment of the situation on the ground was helpful, the mission ***strongly recommends that future efforts of the Consultant be focused on systematic analysis of quantitative project indicators***. The mission further recommends that more attention be given to performance indicators for the various line department activities under Component B.

5. **Component A -- Irrigation Systems Modernization.** The mission noted further improvements in implementation with respect to adherence to agreed quality control procedures and the overall quality of the work being done. The mission was disappointed to see the lack of progress, however, in the work of the Construction Quality Control Consultant with respect to obligations in their contract. Actions to redress this were agreed during the mission and are

detailed in the description of Component A, below. Roughly three-quarters of Phase III sub-basin packages have been awarded and work is underway there. The remaining one-quarter are to be awarded over the next one to three months. The major share of expenditures for Phase III is yet to be made. Nearly all the work under Phases I and II is now completed. Clearance has been given by the Bank for all prior review packages for Phase IV and that tendering is now ready to begin.

6. **Component B – Agricultural Intensification and Diversification.** The participating line departments report further progress against targets in Component B with respect to achievement of both demonstration and impact areas, as well as with yield increases. For example, yield increases under the System of Rice Intensification (SRI) compared to traditional paddy are reported at 35% by the Tamil Nadu Agriculture University (TNAU) and in the range of 39% to 75% for various recent years by the Department of Agriculture (DoA). Yield increases reported for maize by the DoA are at over 50%. The mission notes the continued slow pace of implementation of the micro-irrigation systems (MIS). Recently Government has increased subsidy levels for MIS adoption, to as much as 100% for small and marginal farmers. The mission was asked to adjust financing terms under the Project to match this change and subsequent to its departure has agreed to this change. The mission uncovered an anomaly in the reporting of demonstration and impact area in an analysis of 7 Phase I sub-basins. The analysis shows potential double counting of area by the Department of Agriculture. The Project needs to assess the methodology for reporting on impact areas, and check that the remaining sub-basins are not being over-resourced. This mission also devoted particular attention to Agricultural Marketing. Overall, work in this area has been very encouraging. It was agreed during the mission to focus future efforts on assisting the Commodity Groups (CGs) to reach a higher level of development, with the objective of scaling up improvements in a sustainable manner. The Department of Agricultural Marketing (DoAM) will continue to take the lead role, with the assistance of the Directorate of Industry and Commerce (DIC) to link more effectively with potential private sector partners.

7. **Component C – Institutional Modernization.** There has been some modest forward progress in with the hiring of Support Organizations (SOs) for WUA capacity building. The serious need for this capacity building is obvious from field travel and is underscored by qualitative findings of the M&E Consultant contained in the draft Mid-Term Report. The mission notes, however, that the SOs now working in the field will require orientation training in the subject matter details of this assignment. Further, it is not likely that just a three-day orientation course for SO staff will be sufficient to get WUAs functioning as intended in the project design, and as needed for the goal of benefiting fully from improvements in the tank and irrigation infrastructure. The training will target not only the SOs, but also Department staff in the field, and the central and regional PIM Cells. The details of the agreed training programs are described below.

8. **Component D – Water Resources Management.** Progress has been made since the last mission in getting the State Water Resource Management Agency operational. SWaRMA staff presented a work estimate abstract for operations along with budget details to the mission. This included details of the establishment of the SWaRMA office and necessary items to open the SWaRMA headquarters, and details of the hiring of staff. Agreement was reiterated on the makeup of the Executive Wing, and plans for recruiting subject matter specialists.

9. The next mission, which will be of an intermediary nature, is tentatively planned for late January, 2012.

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

10. All 76 packages, worth Rs. 451 crores, under Phase I sub basins have been awarded out of which 75 packages have since been completed. The balance one package is under implementation and is expected to be completed by October 31, 2011. As of August 31, 2011, a total expenditure of Rs. 431 crores is reported to have been incurred which marks an overall financial completion level of about 95 % (92 % last mission). Region wise financial progress for phase I civil works is about 89 % in Chennai region, 99 % in Trichy region, 93 % in Madurai region , and 96 % in Pollachi region.

11. In respect of Phase II packages, all 43 packages worth Rs. 188 crores have been awarded out of which 39 packaged have been completed. The balance 4 packages are in progress and are expected to be completed by October 31, 2011. A total expenditure of Rs. 165 crores has been incurred ending August 31, 2011, marking an overall financial completion level of about 88 % (77 % last mission). Region wise financial progress is about 85 % in Chennai region, 84 % in Trichy region, and 94 % in Madurai region.

12. As for 30 Phase III sub basins comprising 136 packages, estimated to cost about Rs. 400 crores, 104 packages worth Rs. 299 crores have since been awarded and the works under these packages are in progress with an expenditure of Rs. 65 crores having been incurred ending August 31, 2011 (16% compared to 0% last mission). The balance 32 packages pertain to Chennai region, out of which 14 packages are scheduled to be put up to the Tenders Award Committee by September 30, 2011, and awarded by October 31, 2011. Tendering process is in progress for the remaining 18 packages which are expected to be awarded by December 31, 2011.

13. The proposed 5 DPRs for Phase IV sub basins constituting 47 packages, costing about Rs. 173 crores, were examined by the February 01 – 10, 2011 mission and cleared. 3 DPRs pertain to Chennai region and 2 DPRs to Madurai region. The 4 packages out of the total 47 packages coming under prior review (3 from Madurai region and 1 from Chennai region) were reviewed by the current mission and cleared in respect of technical aspects.

14. The mission feels that the completion of some of the 32 Phase III sub basin packages, still to be awarded, is likely to spill over beyond the project period. Like-wise, the completion of proposed 47 Phase IV sub basin packages for which the tendering process is still to be initiated could spill over beyond March 31, 2013. MDPU, with input from WRD, will prepare an Action Plan outlining key implementation actions to complete this activity in a timely manner.

15. *Construction Quality Control / Quality Assurance and Quality Management System.* The mission made field visits to selected Phase II and Phase III packages in the Chennai and Trichy

regions. It was satisfying to observe that in respect of the important activity relating to raising and strengthening of tank bund sections in Phase III packages, compaction of earth fill was being done through deployment of power rollers/vibratory power rollers and rig mounted plate compactors. Mechanized compaction of earth fill in the bund sections through power rollers and that of the earth fill on slopes with hydraulic excavators incorporating steel plate fixtures has taken firm roots for effectively addressing the earlier grey area associated with inadequate compaction. This is a positive achievement. As for the selected Phase II tank bunds visited by the mission, loose earth fill on slopes was observed in some reaches including deficient slopes at few locations. These tanks being in the defect liability period, compaction of loose earth fill on slopes should be taken up the soonest. It was assured by WRO engineers and the concerned contractors that rig mounted plate compactors would be deployed to address the deficiencies. The mission reiterates the action point agreed by WRD with the February 1-10, 2011 mission that the regional chief engineers should arrange inspections of all the tank bunds raised and strengthened in Phase I and Phase II packages and, thereafter, undertake corrective measures to address the deficiencies associated with loose earth fill on slopes, deficient slopes, deep erosion gullies etc.

16. In respect of other works such as the reconstruction of irrigation sluices and repairs to weirs including concrete skin wall treatment, correct construction procedures conforming to technical guidelines were being followed. Some further improvements have been listed in the detailed field report and provided to WRO separately. These mainly comprise proper grading of every tank bund top duly providing cross slope, compaction of earth fill in the immediate vicinity of the re-constructed irrigation sluices with hand held earth rammers, and avoiding plastering of concrete surfaces to conceal honey-combing, which should instead be properly treated.

17. It was encouraging to observe that the O.K. Card system with the sub activities of works printed in English as well as Tamil had now been firmly established. The mission perused O.K. Cards and also inter-acted extensively with WUA representatives and noted that the involvement of WUAs in construction supervision and quality control through the O.K. Card system was helping in creating awareness on quality and promoting the quality of works. This system also provides accountability. The O.K. Cards should be treated as a permanent record. Procurement of the balance testing equipment has also been completed. This has helped in expeditious on-site conducting of routine quality control tests. The mission during field visits inter-acted with junior engineers, assistant engineers and assistant executive engineers responsible for quality control and was happy to find that many amongst them had acquired full capability to conduct routine quality control tests including the operation of rapid moisture meters themselves with their own hands. This is a good achievement. The regional chief engineers should continue the process of training the remaining junior / assistant engineers with responsibility for quality control so that everyone becomes competent to conduct the tests.

18. *Construction Quality Management and Technical Supervision Consultancy.* This Consultancy was awarded to WAPCOS Ltd. on 15 February, 2011. However, it is still to make itself operational. As per the Agreement, the Consultant is required to establish 2 'ground laboratories' and 2 'mobile laboratories' and conduct at least 25 % of specified quality control tests independently for the respective items of works to ensure their accuracy. The Consultant had agreed with the May 31-June 03, 2011 mission that both the ground and mobile

laboratories would be in place by July 31, 2011. The requisitely needed laboratory system has not been established so far without which the essential quality control requirement of conducting tests independently cannot be full filled. The mission expressed its deep concern to the Team Leader, WAPCOS Ltd. during a meeting held with him who assured that the entire laboratory system would be in place by 10 October, 2011 including induction of 10 laboratory technicians, 2 laboratory supervisors, 10 helpers, and 2 additional site engineers. Chief Engineer, DRCS / Engineer-in-Chief (EiC) should strictly monitor the implementation of this schedule given by the Consultant.

19. The mission discussed the long-delayed commissioning of 4 available nuclear density testing devices with Engineer-in-Chief who intimated that requisitely needed actions had been initiated and, that, these would be commissioned and deployed in the field by 31 December, 2011.

20. Additional comments based on field travel to Chennai Region are attached as Annex 5.

Agreed Actions:

Sl.No.	Actions	Date by	Responsibility
1.	Establishment of 2 ground laboratories and 2 mobile laboratories by WAPCOS Ltd (Construction Quality Management and Technical Supervision Consultant)	October 10, 2011	WRD to Monitor
2.	Induction and placing in position the following staff by WACOS Ltd: 10 laboratory technicians 10 helpers 2 laboratory supervisors 2 additional site engineers	October 10,2011	WRD to Monitor
3.	Regional Chief Engineers to arrange detailed inspection of completed Phase I and Phase II tank bunds to identify all such bunds as are associated with loose earth fill on side slopes, deep erosion gullies, deficient slopes etc. and, there after, initiate deployment of rig mounted plate compactors for rectification of deficiencies and appropriate compaction of earth fill.	October 31, 2011	WRD

4.	Engineer-in-Chief to ensure commissioning of the available 4 Nuclear Density Testers as well as arranging training of 10 engineering personnel and deployment of these devices for conducting density tests on the earth fill compaction on tank bunds in Madurai and Chennai Regions.	December 31, 2011	WRD

Modernization of PAP operation system

21. This component was aimed at modernizing/automating the irrigation regulation system for PAP. After understanding the system, a stepwise modernization has been agreed. It was agreed that as a first step, the information system will be modernized and the real time monitoring system will be installed. However despite several reminders and follow up during recent missions, no progress has been made till date. During a visit in mid-August ahead of the main mission, it was agreed with the EiC to dedicate two engineers trained in canal automation for preparing the bid document. Further, it was agreed that by October 2011, the tenders would be floated. *However, to date no information has been shared with the mission about progress on these steps.*

22. *Decision Support System*: This activity aims at developing a Decision Support System (DSS) for Integrated Water Resources Management. The Institute of Water Studies (IWS) is the responsible agency for this activity. This tool was expected to support the convergence of various interventions being introduced in the IAMWARM. This activity has delayed substantially. After years of delay, an EOI was floated to procure consultancy for four sub-basins. Following the pre-bid meeting with the short listed consultancies, the IWS proposed to reduce the duration of consultancy in order to match with the duration of project. The duration of this consultancy has been a moving target since beginning (initially it was 40 months). Under the circumstances, the mission agreed with the MDPU to drop this activity from the Project.

IV-- Component B: Agricultural Intensification and Diversification

Agricultural Engineering Department

23. During the MTR, the Agriculture Engineering Department (AED) was allocated Rs 1622 million. The revised program presented to the mission shows a figure of Rs 1800 million. Overall AED has been able to disburse only Rs 375 million. Examination of the program for AED shows that substantial cost under-runs can be expected in this sub-component. That stems from established expenditure rates thus far in project implementation for micro

irrigation, water harvesting structures, and buried pipeline, as well as prospects for the farm machinery distribution program.

24. *Micro Irrigation System*: A total of 13,329 ha of MIS have been installed against a revised program target of 34,429 ha. After a very slow start, the progress in implementation of MIS has picked up following several revisions in approach and procurement procedures, but a substantial further increase is needed to approach the program target. The farmers acknowledge the benefits in terms of increase in yield by 20-30%, saving in water and reduction in labor cost when compared with flood irrigation. Yet the adoption rate under IAMWARM is limited. Recently the subsidy for AED has been enhanced to 100% for small and marginal farmers that would reflect on total cost allocated for AED. The mission will review with Bank management the possibility of matching this subsidy pattern under the Project. In support of the subsidy, discussion was held on the economic benefits of savings in water use and electricity, which are not captured in financial analysis of MIS adoption. *The MDPU provided data on this and on that basis the mission agrees to extend the same subsidy terms to the Project.*

25. *Piped Conveyance system*: The mission was pleased to note the progress in gravity based piped conveyance systems in two canal irrigated outlets of Veruvedampalayam distributary and one in tank command in Villipuram. AED is promoting the water management initiative "commutation water for water" in these two outlets (50 ha) in Veruvedampalayam distributary that would allow reallocation of water saving among each other. This would result in three times water use efficiency and substantial energy saving (63000 kWh or Rs 12000/ha per year) due to reduction in groundwater pumping. The AED is requested to evaluate these systems and provide the evaluation in terms of water use efficiency. Based on the success of these installations, AED has proposed to install more systems in the same distributary. They determined that in the R3 section of the command area, it would be possible to operate pipe conveyance system with drip irrigation system with available land slope and without needing any source of energy.

26. *Farm Machinery:* It was reported during the last mission that the usage of farm machinery given to WUAs was not effective. The primary reasons were no power (tractor) equipment available with the WUA and mismatch between requirement and supply. Therefore for new proposal AED has done reassessment to match the demand with the supply. The purpose of this aspect of the Project is to assist in WUA formation and functioning as a unit. The objective of addressing the large machinery gap in agriculture in general is much broader than this and not directly a part of the Project. AED submitted to the mission a proposal for providing farm machinery to individual farmers on a subsidy basis comparable to the existing GOI scheme. The mission is not in favor of using Project funds for this purpose as: i) the benefits would flow primarily to the larger, well off farmers; ii) unlike the drip irrigation intervention, the machinery intervention does not directly address water savings; and iii) the procurement procedures for managing such an arrangement are questionable.

Department of Agriculture, Department of Horticulture and Tamil Nadu Agriculture University

27. These three implementing agencies report approximately 113,500 ha of demonstrations/expansion in area has been achieved to date (91,000 ha last mission) with more than 300,000 ha of impact area adopting promoted technologies.

28. During the Mission visits were made to Phase I, II and III sub-basins: Varahanadhi, Ongur, South Vellar, Anaivari Odai, Agniyar, Ambuliyar, Araniyar and Kosathalaiyar, where demonstrations, impact and expansion areas were observed on SRI, floriculture, vegetables, bananas, vermicompost, casuarinas and green manure.

29. It is recommended that the project reports at the start of the next mission on achievements against the targets outlined in the results framework of the PAD; the increase in value of crop production per unit irrigation water supply, increase in area under high value crops, increase in area under SRI, increase in crop production and area covered by Integrated Pest Management and Integrated Nutrient Management (IPM/INM)/organic farming are indicators relevant to these implementing agencies and data from the monitoring and evaluation consultant can be used to verify project data.

30. Discussions with farmers during the field visits revealed that many were adopting soil testing, which is a pleasing development. However, it was evident that some farmers who had sent samples for testing, would not receive the results in time to be useful for the current crop. Further education of farmers during demonstrations is required in terms of ideal timing of soil testing for crop management, and should take into account the turnaround time (and capacity) of the testing facilities.

31. It was observed on the field visits that green manure was being popularized in many fields, as compared to several years ago when it was barely noticeable. Farmers report that this was a traditional practice that has gone out of use for various reasons, and through interventions of the project is regaining popularity. This intervention has the capacity to improve the soil fertility over large areas, and general indications are that it is cost effective, particularly when compared to organic manures and composts. The nutritive values of various green manure crops is reasonably well known, however an comprehensive analysis of the associated costs and benefits for farmers would be useful, particularly as farmers are indicating that there are considerable savings when green manure replaces farm yard manure (which has considerable spreading costs and uniformity issues).

32. The project continues to report high degrees of success in terms of impact, 300,000 ha to date (farmers adopting technologies promoted by TNAU, DoA and to a small degree DoH), and this has been heavily promoted as an achievement of the project and has been reported by previous missions. Currently in Phase 1 sub-basins TNAU is reporting the achievement of less than 40% of the targeted 'impact areas', at the same time the DoA reports 88% success rate (over a much larger area). An analysis of the reported demonstration and impact areas in seven of the nine Phase 1 sub basins (excluding Palar and Alayiar) shows that of the 116,264 ha of registered ayacut, 220,992 ha has been covered by either a demonstration or targeted as an impact area,

i.e. 190%, when the 'expansion area' (DoH) is considered it increases to over 200%, in contrast the average cropping intensity across the area is 120%. This leads to a couple of possibilities, it would appear that DoA is double accounting impact areas in some sub basins and the activities (DPRs and additional activities) for Phase 1 (acknowledging that the concept of 'impact areas' has been retroactively applied) exceed the requirement to adequately cover the 'with project' cropping intensity (in the sub-basins analysed). The average ratio of demonstrations to impact area in the 7 sub-basins is approximately 1:4 while the reported intensity of demonstrations to registered ayacut is less than 1:3 (one hectare of demonstration for less than 3 ha of ayacut area). It will be interesting to compare these statistics with the findings of the Mid-Term Report currently being prepared by the monitoring and evaluation consultants. The project needs to assess the methodology for reporting on impact areas, and check that the remaining sub-basins are not being over-resourced as appears to be the case in Phase 1.

33. Discussions during the field visits with farmers was that they were generally satisfied with the increases in productivity, however it is evident that there is much potential on the harvest management and marketing side. Many farmers, particularly those involved in horticulture were very aware of the market outlets, wholesalers and retailers, and were getting marketing information from various sources. However few farmers were working together as groups, where there is potential for consolidation of produce and collective bargaining with buyers. The marketing department should consider expanding support for commodity groups, with a flexible approach that recognises that some farmers/groups are much further advanced than others in crop value addition.

34. The financial performance of the DoA, DoH and TNAU is at about 43% (32% last mission, see table below). During the previous mission additional activities were suggested by TNAU and DoA to account for the likely savings and many of these activities have been initiated in the current cropping season. Some minor additional activities were requested by the DoA and these were agreed to on a limited basis, as the project is scheduled to close in approximately 18 months time. During the previous mission it was suggested that further proposals for additional activities would require very strong justification. Prior to the mission the DoA made requests for three further activities, including 1000 ha each of maize and pulse demonstrations for the wider scale promotion of two plant productivity improvement agents developed by TNAU, and 250 ha of the sustainable sugarcane initiative. For the pulse and maize interventions, it is imperative that these agents are tested against current best practices, for example as an alternative to foliar DAP sprays on pulses, and that the yields, production costs, and control plots are kept for each, and an economic analysis conducted at the conclusion of each demonstration. These activities were agreed to on a limited basis for an estimated cost of Rs 35 million.

Financial Status (Rs. Crore)

Implementing Agency	PAD	Expenditure^	Expenditure against PAD
Agriculture Department	98.0	31.08	32%
Horticulture Department	73.0	43.3	59%
TNAU	88.9	37.92	43%

Total	259.9	112.3	43%

^ up to 31/8/11

35. In the previous mission a number of project interventions were identified as having good potential to be mainstreamed into regular activities of the line departments, such as the concept of 'impact' area targets, the use of demonstration registers, card systems for demonstration (and impact farmers) that introduce farmers to the concepts of keeping crop/farm records) etc. It is recommended that the MDPU package these (and other) innovations and assess the willingness of the line agencies to mainstream these into their regular programs.

36. The *Department of Agriculture* is reporting large areas of demonstration (44,020 ha) and the associated impact area (228,643 ha). During the previous mission a number of additional activities were reviewed and given technical clearance, as follows; (i) an innovative approach to the introduction of pulses, (ii) farm waste composting, (iii) capacity building activities and (iv) crop competition for a budget of Rs 74 million.

37. The *Department of Horticulture* reports to have achieved 28,259 ha of expansion area, of which 5258 ha is reported to have been sustained. (The methodology of reporting sustainability may have to be redefined, as farmers who rotate between field crops and horticulture are excluded). The mission observed that the quality of the interventions was generally high, and a number of farmers were visited during the mission who had were part of previous years expansion efforts and were sustaining the diversified crops. In the previous mission it was noted that the DoH is now also including impact areas, and reports to date that 474 ha has been covered.

38. The *Tamil Nadu Agricultural University* has also achieved solid progress, reporting over 42,294 and 75,971 ha of demonstration and impact areas respectively. The continued high quality of the demonstrations, is also worthy of commendation, and is setting a suitable standard for both farmers and extension workers.

39. TNAU made 13 proposals for additional activities in February 2010, nine of which were given technical clearance in the previous mission. These activities included the (i) upscaling of E-Velanmai, (ii) introduction of Furrow Irrigated Raised Bed (FIRB) in transplanted rice, (iii) implementation of Sustainable Sugarcane Initiative (SSI) in sub basins, (iv) pilot of Conservation Agriculture, (v) demonstration of SRI concept in Direct Wet Seeding of rice, (vi) installation of Agro - Advisory through Touch Screen, (vii) identification and Upscaling of GHG emission reduction technologies in SRI for carbon trading, (viii) statistical investigation of the inter and intra variability in yield data and (ix) development of farm level optimal cropping pattern (Scientific Farm Advisories) to maximize the farm income. These are budgeted at approximately Rs 50 million. Of these it is reported that the majority are under implementation, however the two activities that were highlighted in the previous mission as requiring the most immediate attention, i.e. the pilot on conservation agriculture and GHG emission technologies for SRI appear not to be moving in a manner that would see them adequately completed by project close, particularly as these were originally planned as a two and three year projects respectively. As such the mission has serious concerns that these activities will not deliver credible results before the project close. It is recommended that

TNAU indicate whether it is still feasible to continue with these activities, if so then implementation (work plans, due last February), and the hiring of international consultants need to be completed as a matter of urgency. TNAU needs to be proactive, and use the in-country research linkages to identify suitable consultants, prepare terms of reference and have these contacted within the next 6 weeks.

40. TNAU is reporting significant under achievement in meeting the targets, currently lagging at 41%, set for 'impact' areas. This is becoming somewhat of a concern as the project outcomes are highly dependent on the adoption of technologies. It is interesting that the Department of Agriculture is able to report much higher rates for impact area (64%) against targets without the dedicated staff resources of the University. It is acknowledged that a significant portion of this lag will be covered in the subsequent season, however there is still a lag, for example in Phase 1 sub-basins (where TNAU activities are winding down), 60% of the targeted impact area has not been covered. These anomalies require investigation, and tend to indicate that the demonstration: impact approach may need refinement. It could be that the increase in the ratio (demonstrations to impact areas) earlier in the project has increased the focus on conducting demonstrations at the expense of the impact farmers. It also appears that not enough has been invested in convincing adoption farmers of the benefits of the demonstrated technology, and may require an integration of the demonstration impact approach with participatory tools and extension through groups (such as farmer field schools). It is recommended that TNAU investigate these issues.

Issue	Who	When
Check accounting methodology for Impact areas	DoA	October 31, 2011
Assess that resources have not been over allocated as for Phase 1	DoA, TNAU	October 31, 2011
Under achievement of impact areas	TNAU	November 15, 2011
Advanced work/implementation plans for Conservation agriculture and GHG initiative and hiring of consultants	TNAU	November 15, 2011
Assess the Demo/Impact model as an extension tool	TNAU	December 2011

Agricultural Marketing

41. It was agreed that the Project's marketing sub-component needs to: (i) ensure that the benefits should be spread across a wider number of beneficiaries; and (ii) build on the interventions which appear to be working. Currently this component has only spent about $ 5.7 million (i.e.26 % of the finds budgeted), with another $ 1.5 million of sanctioned expenditure in the pipeline.

42. The sub-component has had two main interventions. Firstly, the formation of Commodity Groups (CG), along with some on-going support, mainly in terms of training, investment and technology. Secondly, the creation of Agri Business Centers (ABCs) with an initial focus on shared infrastructure (drying floors, collection centers, storage).

43. Based on limited field observations, it appears that the formation of some 1470[2] CGs has unleashed a tremendous surge of initiative, entrepreneurial dynamism and the empowerment of farmers to collectively seek out new ways to increase their profitability. This is a major achievement of the Project and one which has positively affected a large number of beneficiaries and appears to be delivering a strong stream of economic benefits. The Department of Agricultural Marketing is to be congratulated. This intervention will be upscaled, and the field lessons captured to better inform this process.

44. The story on the AgriBusiness Centers is far less positive. At their current stage in development the ABCs' records provide no evidence of: (i) high utilization[3]; (ii) financial sustainability; or (iii) any movement towards management and operation of the ABCs' by Producer Companies (PCs) as envisaged in the project design.

45. The emphasis of the future program will be on up scaling the formation of new CGs, the graduation of CGs into both strengthened Farmer Organizations and effective Producer Companies, and in some cases CGs taking over operating of ABCs.

46. The Dept of Agriculture Marketing has submitted 5 proposals: (1) The Consolidation of CGs into PCs; (2) Linkaging of farmers to markets; (3) TA for value chain development; (4) Information, Education and Communication; and (5) Hiring 2 Agricultural Marketing Specialists. In view of the revised action plan, set out below which provides an integrated approach to the progressing of the Marketing component, these activities have been included into an overall plan. The budget has been adjusted to minimize double counting and to take into account the remaining time – line of the Project.

47. So far the cost incurred in mobilizing the nearly 40,000 members of CGs has largely been covered by non-project budgets. The numbers mobilized probably amount to about 10% of the total number of farming household that the Project aims to benefit. Unit project costs per farmer currently amount to about $100, but are 3 to 6 times higher for the relatively few benefiting from direct investment in ABCs. If the marketing interventions are going to be upscaled and benefit a significant number of farmers, the unit costs have to be kept within a sensible range.

Agricultural Marketing Action Program

48. *Up Scaling the Mobilization of Commodity Groups.* The target for CGs formed will be raised from some 2,000 CGs to 2,500. This will raise the number of beneficiaries to some 60,000 (i.e. about 15% of total project beneficiaries). DoAM should be prepared to use NGOs and especially, the members of successful CGs to mobilize new CGs. Included in the fund requirements will be a budget for funding of demanded shared facilities by the newly formed CGs. This could cover equipment that provides primary value addition such as drying floors, storage facilities, and quality diagnostic tools (e.g. moisture meters).

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[2] In aggregate amounting to some 38,600 beneficiaries.,

[3] In the ABC visited the utilization of facilities appeared to be in the range of 10-15%, and the funds generated would not even cover the bare minimum of a 5% depreciation charge

49. DoAM will provide mobilization and commercially oriented training (e.g. marketing linkaging, and opportunities to learn from existing successful CGs) and small tools that are linked to improving product quality and accuracy (e.g. moisture meters, weighing scales, grading tables) in ways that the producers are not currently doing. The budget for both interventions is Rs 20,000 per CG for training (which covers the DoAM's additional staffing and per diems for trainers to form CGs) plus some Rs 10,000 for small tools, which are necessarily linked to trainings received.

50. One of the outcomes of the mobilization phase will be an outline business plan, including the more significant investments needed. The upper limit of the financial support will be Rs 12,500 per member, or up to a maximum of Rs 350,000 per new commodity group. This will challenge the CG to invest wisely, and in the knowledge that, if successful additional support, maybe available to raise their commercial operations to a higher level. (See below)

51. *Promoting Growth and Development in Existing Commodity Groups.* A significant proportion of the 1,500 CGs formed so far are receptive for growth and development. Those that are selected for this process will need to demonstrate: (i) evidence of successful operation in the past; (ii) enthusiasm for future support; (iii) have both elected officers and its own positive bank account; and, (iv) a sensible plan for the future covering production, marketing and long term self financing. Three future options are envisaged: (i) those that wish to take the operation of their CG to a higher level; (ii) those who wish to create a Producer Company, which might operate as an ABC from their existing location; and (iii) those who are ambitious enough to form a formal Producer Company and want to take over the management and operation of an existing ABC.

52. *Role of DoAM.* DoAM responsibility will be those existing CGs whose business development plans are confined to basic value added activities, rather than those who wish to make a significant investment more ambitious processing activities. A draft budget for DoAM is set out below (table 1). This is based on an assumption that DoAM will promote 1000 new CGs with training/mobilizing and some small tools support (Cr. Rs 2, and Rs 1.5 respectively), and provide training/ market linkages and some additional tools to the 1500 existing CGs (Crore Rs 3 and Rs 1.5 respectively). In total Crore Rs 12.39 is available for demanded investments in shared productive assets. The Department of Agricultural Marketing should submit a proposal for the funding necessary to carry out this expanded program, along the lines agreed during the mission.

53. It is envisaged that DoAM's sponsored training will include post harvest trainings (for example provided by the Post Harvest Institute) , commercial and business trainings and will include developing a future plan, covering investments. For existing CGs, the budget for the small tools linked to lessons from the trainings is Rs 15,000 per CG, while the additional investment per group will be a maximum of Rs 600,000 or Rs 20,000 per member, with the CG committing a minimum of 10% from its own shared account.

54. *Role of Directorate of Industries and Commerce.* This next stage in the development of CGs will require new skills, expertise and a more commercial approach than the DoAM has. A

proposal has been submitted to build in 14 District offices of the Directorate of Industries and Commerce (DIC) a small unit to facilitate the ongoing commercialization and market orientation of the project's agricultural production. This arrangement has the benefits of building on the foundation of DIC's existing skill base in; mobilizing grant funds, providing technical and engineering advice, linkages to the local private sector, especially the local Value Added Agribusiness Sector, business oriented training courses, partnership with the local Banking community and an overall commercial attitude and culture. DIC will support and nurture CGs through the process of diversifying into processing as well as the formation of Producer Companies. Additionally DIC will function as catalyst in creating linkages between the CG/PC and the local agribusiness sector and other business communities. DIC will be able to mobilize project funds for entrepreneurs for investments which are not currently covered by State and Federal schemes.

55. The existing proposal by DIC will need to be refined. It is envisaged, that in addition to the one administrative assistant, each District office will be staffed by a Senior Agriculture Business Advisor (i.e. 7+ years of professional experience) whose primary responsibility will be to work directly supporting the CGs and PCs. Additionally, there will be a Junior Agriculture Business specialist whose role will be; market research, creation of databases of agribusiness and organization of trainings. S/he is envisaged to have a post graduate degree in Agricultural Marketing/ Economics/Business and with 2 years of working experience. DIC will lead in contracting staff for these positions. The DIC-Ag. business units can provide funding for CGs /PCs, as well for key agribusiness entrepreneurs who open new opportunities for project beneficiaries. These will be based on a business plan drafted between DIC and either the existing CG or the newly formed PC. The proposals will be vetted and approved by District Advisory Committee. The budget investment ceilings will be in line with those for DoAMs work on upgrading existing CGs (e.g. Rs 20,000 per member).

Supporting Work

56. *Survey of the mobilization and development of existing Commodity Groups and the Operation and Management of Agricultural Business Centers.* A survey of a random sample of existing 30 CGs, including at least 10 drying yards, 7 stores and 3 collection centers, will be carried out under a consultancy contract. The aim is to learn; (1) perception of beneficiaries of the existing process of CGs mobilization, training and resource allocation, with the focus on reporting on the lessons of effectiveness and potential for improvements in methodology (2) a calculation of economic benefits to date generated, and (3) a grading of the CGs' likely sustainability with reference to their (i) financial record keeping and future FM planning, (ii) the effectiveness of the CGs' management, (iii) existence of a sensible forward plan for CGs' business development (iv) the role, or otherwise, of ABCs in the CGs development and function, and (v) future strengthening needs.

57. A study will also be made of a random sample of 6 ABCs, including at least 3 drying yards, 3 grain stores and 2 collection centers. The work will generate lessons on: (1) the level of utilization of drying floors, crops stored, volumes traded from collection centers, level of activities of the input supply shops and number of farmer benefited; (2) the economic benefits

to date generated; and (3) an assessment of the ABCs likely long term sustainability at existing levels of operation.

58. These two studies can be carried out either by the existing M&E consultant (subject to procurement clearance) or a specialist consultant and will be contracted and supervised by the MDPU. The results of this program will be used to inform the formation of new CGs, the development and graduation of existing CGs, and the future development of the ABCs, including the transfer of management of these facilities to Producers Companies.

59. *Post Harvest Study.* A study will be commissioned to provide greater insight into post harvest needs and the impact of investment in post harvest infrastructure. This will work include a study of (i) the utilization and need of drying floors, (ii) comparison of the quality, price differences of product dried in drying yards as compared with road dried, (iii) the range of moisture contents of product traded, (iv) the impact of moisture meters in reducing moisture content variation, and (v) an assessment of the economic benefits of drying floors, rurally based stores and moisture meters.

60. *Value Chain Study.* To inform the process of exploring new market opportunities and agricultural diversification, the MDPU will commission 5 value chains studies. The focus will be on those enterprises viewed as being important and with significant growth potential.

61. The total budget for the marketing component is some $ 22 million (Rs 92.5 crore). The table below estimates the likely future budget requirements. These have been calculated on the basis of sensible unit project investment cost per farmer. In total the target number of beneficiaries will be 60,600, or about 15% of all project farmers. Of which around 3,000 will be members of CGs' that graduate to form PCs. In total it is targeted that 3 ABCs will be operated by PCs, and that 6 separate PCs will be formed.

Table 1 -- Outline Budget for the Marketing Component

Marketing Budget - DoAM	Soft	Hard	Comments
Focus on Mobilizing new CGs and building Capacity in Existing CGs	Rs. 50,000,000	Rs. 30,000,000	this covers 2 full time AgBiz staff, CG training e.g. market linkages, technology, logistics, business management and accounting, plus small tools
Investment in CGs		Rs. 123,900,000	These investments will be made on a demand basis, and can include not only drying, storage, but also specialist equipment
Sub-Total DoAM		Rs. 203,900,000	
Marketing Budget - DIC			
DIC - 14 Districts + HQ	Rs. 40,000,000		
Investment in CGs, PCs and entrepreneurs		Rs. 91,408,800	This covers investments in existing CGs wishing to invest in processing, PC investments and in entrepreneurs, when existing schemes do not cover
Sub-Total DIC		Rs. 131,408,800	
Study of CGs & ABC		Rs. 1,134,000	Lessons from project experince in existing CGs & ABC
Post Harvest Study		Rs. 840,000	Focus on crop drying & storage
Value Chain Studies		Rs. 2,100,000	5 studies of important Value Chains
Sub - Total Miscellaneous		Rs. 4,074,000	
TOTAL FUTURE BUDGET		Rs. 339,382,800	
Pipline Expenditure		Rs. 61,200,000	Marketing expenditure currently being made by DoAM
Existing Expenditure		Rs. 239,948,000	Already Disbursed funds for Marketing
TOTAL		Rs. 640,530,800	

Action Table

Marketing Component -	**By whom**	**By when**
Submission of costed plan for expanding the formation of new CGs	DoAM	November 1, 2011
Survey of Commodity Groups and ABC – preparation of TORs and contracting consultants	DoAM & MDPU	November 1, 2011
Completion of Study	Consultant	January 25, 2012
Up Scaling the Mobilization of Commodity Groups + 1000 CGs	DoAM	March 2013
Agreement on role, responsibilities of DIC, and the operation of block grant systems	MDPU & DIC	November 1, 2011
Appointment of contract staff at DIC, DoAM, and formation of supervisory committees at the District levels	MDPU, DIC and DoAM	January 25, 2012
Report on Post Harvest practices and needs	MDPU + consultants	January 25, 2012
1st 4 Value Chain studies completed	Consultant	March 31, 2012
Formation of 1st five Producer Companies	DIC-AB Cell	July 2012

Livestock

62. The Animal Husbandry Department (AHD) reports that almost all planned activities for Phases I, II and III (FY 2007-08 to 2010-11) in many of the activities have been achieved – 99% in number of AI performed, 99% in fodder development, 100% in regards to azolla demonstration, farmers interactive meetings, fertility cum health care camps, farmers training, exposure visit to farmers and sheep and goat deworming . So far the project is able to produce 295,194 calves, of which 147,961 are female calves against the overall projected target (in all 4 phases) of 166,000 lactating crossbred cattle. Against the estimated milk yield of 300 M tons for 2010-11, the project was able to increase the milk yield to the tune of 305 M tons in 44 sub basins. Considering the prevailing calving rate in the project area (53% as reported by AHD) the project will be in a position to produce 218,625 female calves from the AI carried out through FY 2010-11. With a targeted calf mortality of 10% in female calves and 5% in adult mortality, a total of 185,831 lactating animals will be available in the project area from the AI carried out till Phase-III. The reported AI and calving are captured through the manual reporting system followed by the AHD, which requires a review. The reporting system needs computerization with appropriate animal identification and cross verification system in place in order to ensure accuracy and transparency of the achievements claimed. Sub basin wise analysis and specific interventions to address issues related to specific sub basins should be taken up. The financial utilization till FY 2010-11 is 84% against the sanctioned financial outlay of 18.25 crores.

63. Interaction with the individual farmers, farmers' groups and members of the WUA, as well as the visible impacts gives an impression that the AHD is able to create a niche among farmers due to their frequent visit and continued interaction. In many of the visited sub basins, there is considerable level of involvement and coordination among the district level functionaries starting from Joint Director, Assistant Director of Animal Husbandry down to field level veterinarians and their sub ordinates. The team approach followed in various phases of the project implementation has contributed greatly to the overall achievement of the given targets.

64. Fodder development activity has motivated many farmers to move towards dairy farming. Although the fodder development activities have helped many farmers to increase their earnings, the adoption is highest (almost 100%) among the farmers who are intensifying their dairying in their mixed farming systems. The adoption rate among the small farmers who wish to maintain few animals seems to be low (30-50%). For example many of these small farmers who were supplied with the fodder crop Co-3, have switched over to other crops and vegetables after taking few cuttings. The major reason quoted is water shortage during summer months. This is an observation, and a system need to be in place to follow and record the details of farmers who successfully maintain the fodder plots and the reasons for non adoption. The selection of fodder species and varieties should be region specific given the agro eco conditions and water availability. Efforts should be made to supply root slips at the onset of monsoon so that the survival rate improves. Equal consideration should be given for drought resistant species like Kolukkattai grass (Cenchrus sp) and Stylosanthus. If annual varieties like sorghum are considered, timely seed availability in the villages needs to be ensured. Intercropping and bund cropping with tree fodder species like Sesbania need to be promoted on a larger scale. Promoting subabul needs reconsideration due to its invasiveness and probable negative effect on the eco system. Farmers expect credit facilities for establishing water saving techniques like installation of sprinklers, rain guns and drip irrigation systems. Presently banks do not lend money for fodder development investments.

65. Adopting azolla cultivation is very limited. Barring few adoptive and innovative farmers, many failed to maintain owing to reasons like failure of growth, flooding during rainy season and difficulties in repeated washing before feeding. In spite of this few farmers (in Abhinav Village) have innovatively designed azolla tanks to prevent flooding and efficient growth. The demonstrations and trainings should clearly explain the importance of processes. There should be a continued follow up to ensure success.

66. Interventions in breeding has satisfactorily achieved its objective of door step delivery of AI, improving conception rates, reducing fertility problems, and better calving rates. As reported the conception rates have improved from 48% (in 2007-08) to 55% (in 2010-11). This is commendable in the backdrop of national averages ranging from 30 – 40%. Again the emphasis is to capture the data more accurately. Organizations like National Dairy Development Board (NDDB) has developed software (INAPH – Information Network for Animal Productivity and Health) to capture breeding, health and feeding information more accurately. Such systems could be put in place for an efficient MIS. Although the conception rates are at satisfactory levels, the observation indicates need for improvements in AI procedure at the field level. There should be a uniform Standard Operating Procedure (SOP) for AI practices to be prepared and circulated for better conception and prevention of microbial contamination. There are issues

related to procurement and timely supply of frozen semen and liquid nitrogen, which requires a critical review.

67. Infertility camps are largely successful and as reported 60% of the infertile animals became pregnant due to timely and simple interventions. Records and animals verified during field visits support the same. These camps need to be strengthened in terms of medicines and funds for publicity and mobility. The infertility and health camps also could be utilized to spread better animal management, feeding, breeding and health practices using audio visual aids and posters.

68. Trainings are again adopted well among the farmers who are intensifying more towards dairy farming. Although many of the farmers adopting one or two practices like better feeding or clean milk production, it did not motivate them to adopt a package of better dairy farming practices. Exposure visits to a successful farmer within the vicinity of the training place should become part of the training process. Methods such as farmers' filed schools (like the one established at Abhinav Village in Salem District) could serve to provide better learning practices by seeing, doing and learning rather than class room based theoretical sessions.

69. The WUA veterinary units were established with an objective of developing a self sustaining serving institution on commercial basis. It was learnt from the AHD officials that there is a high turnover of veterinarians in these institutions. The project could successfully retain only 40 veterinarians in WUA veterinary centres against the target of 70 units. The reason quoted is the availability of better paying employment opportunities. Either the incentives and honorarium paid to the vets need to be reviewed or other models like mobile AI technician concept could be considered for ensuring an un interrupted basic veterinary and health services to the farmers.

70. MIS should be developed to capture information related to reduction in calf and adult mortality, improvements in fertility problems, fodder production and increase in milk yield.

71. In terms of capacity building, the veterinarians and implementing officers need additional trainings in infertility management of cattle, designing fodder development program for specific agro eco region, participatory extension methods like farmers' field school and project monitoring.

Fisheries

72. Fisheries activities have made good progress, in general. Progress made in farm ponds utility under Phases I and II for fish culture and seed rearing in fish seed banks are noteworthy. Seed rearing in cages has also been progressing well. Following are the areas that need priority attention to ensure continued good progress of the project.

- The IAMWARM Cell in the Fisheries Department is highly understaffed at present as many of the staff have moved out due to promotion, transfer, etc. As a result, the Cell has not been able to build a reliable information base nor to provide the required level of support to the field activities. In view of the workload and the potential increase in workload with the additional DPR, urgent steps to provide necessary staff to the Cell need to be taken.

- The numbers of farm ponds that have been taken over in Phase III of the project and stocked with fish seed are only 126 as against the set target of 395 ponds. Early action should be taken to facilitate handing over of appropriate tanks for fish culture from AED to Fisheries Department. If the target is not achieved significant amount of money allocated to provide support to undertake fish culture would remain unused. Further, this would hamper the target of fish production fixed under the project.

- Fish seed nursing in cages is considered as one of the successful activities. However, the Department should gather all the information from cage operators on the economics of the activity, including sustainability aspects beyond each phase of the project. A data base with all the addresses of beneficiaries with their mobile number may be built and made available on the website. A user friendly extension bulletin may be produced with economics as it would help in scaling up the activity.

- Seed banks need to maintain records on the tanks where the seed produced is stocked and the people whom the seed has been sold. In the previous mission, problems existing in the seed banks established in Manimuthar and .Kottakarayar were identified. Although additional budget is requested to address the water supply problems of these seed banks in the additional DPR, these seed banks current level of seed production and their performance require closer examination.

- Ornamental fish culture unit's activities and outputs need careful examination due to lagging implementation progress. In the Sept. 2010 mission too, the problems associated with the ornamental units established under Phase I were identified. It is suggested that this activity be examined carefully and necessary support given to complete the work under Phase II, III and IV.

- Similarly, tank fish catch data requires better monitoring and recording. Available staff may be best utilized to gather the necessary information.

- Pen culture is a new intervention and it is reported that the installed pens have given good results. However, data collections to demonstrate the benefits are not available. Here again, it is suggested that monitors be used to gather information and use such information for scaling up the activity.

- Fish kiosks location as well as hygiene in kiosks would be key to success. Care may be exercised to ensure the selection of places that will be closer to market place.

- In the additional DPR, to achieve targeted fish production in the project, emphasis has been placed on fish seed production. Location of these seed rearing and production centres should be in such places where water retention of soil is good with good availability of water. Hence, care may be taken to locate earthen seed banks in such places with good soil and water and not to aim at spreading them to all basins. With the improved road communication available now in the State, seed can be moved to different places easily.

IV -- Component C – Institutional Modernization for Irrigated Agriculture

73. The Mission held discussions with seven water users associations from the Anaimaduvu Reservoir Project System in the Valapadi taluk of the district of Salem. In the discussions, WUA general body members, TC members and Presidents were present along with local village Panchayat President. The Mission also met the Support Organization (SO) named the Council for Health Education and Rural Upliftment (CHERU), which is responsible for the sub basins of Upper Vellar, Swthanathi, Anaivari odai and Chinnar. The SO has organized a team consisting of one Team Leader, two Community Organizers, and eighteen para workers to cover a total of 127 WUAs within the four sub basins. The Mission also met with the WRO Superintending Engineer, the nodal officer in charge of the district of Salem as well as with one Assistant Engineer (AE) as the competent authority in charge of working with the WUAs in the region.

74. The Mission held detailed discussions with the members of the SO team. The Mission learned that the SO has commenced works in the region from July 2011. Thus far the SO has conducted a launch workshop with all the of key line departments operating within the four basins including all the sixteen Assistant and Junior Engineer competent authorities. They have also divided the eighteen para workers into clusters with each para worker to engage exclusively with seven to eight WUAs. The SO has conducted cluster-wise familiarization trainings of the para workers. The team leader was not present during the visit, however, the Mission learned that a majority of the para workers are high school graduates and for many of them this is their first job. Secondly of the two Community Organizers, only one of them has a background in community mobilization and capacity building of farmers around issues of water.

75. The Mission observed that there is a general lack of awareness about the Tamil Nadu Farmers' Management of Irrigation Systems (TNFMIS) Act and its legal obligations, as well as poor understanding of the core functions of a WUA and its roles and responsibilities as WUA members among all three groups: (i) the members of the WUAs; (ii)the nodal officers from the WRO; and (iii) the SO. For instance during discussions with the WRO nodal officer and the SO, the Mission learned that due to lack of information WUAs were erroneously being mandated to register the Association as a Society. However, as per the TNFMIS Act, registration of WUAs is not required in order for the WUA to become operational as an Association and therefore they should not be required to do so. As a result, there is confusion within the WRO staff and the SO as to what information to provide to the farmers of the WUA. The Mission learned that the WRO AE deputed to this area has not received any training as of now on his roles and responsibilities as the competent authority to the WUAs. In addition, the WUA members provided feedback that as of now they have received little guidance from their respective WRO competent authorities on how to carry out operation, maintenance, and management works, set up bank accounts, conduct meetings, distribute water equitably among members throughout the system, set up specific committees, and collect funds. WUA members also pointed out that they were unclear as to the purpose and need of the SO. Based on these findings, the Mission strongly recommends the immediate need for the planned introductory orientation training as well as additional trainings on community mobilization around village-level water issues for all members of the SO team. The Mission also recommends specialized training on WUA capacity building, TNFMIS Act and general Participatory Irrigation Management (PIM) for the concerned WRO competent authorities.

76. *Support Organization Orientation & Follow-up Training*: Currently, three SOs of phase I and II packages have begun working in the areas of Madurai and Trichy regions of the state without undergoing an orientation program or training. Based on the recent field visit findings and the recommendations of the Mission from the February 2011 Mission Aide Memoire, there is urgent need to conduct a series of intensive orientation workshops and trainings for the SOs that have begun working. The Mission held detailed discussions with the MDPU, the WRO PIM Cell and the Irrigation Management Training Institute (IMTI) officials to operationalize the orientation program. MDPU and IMTI agreed that a three-day orientation program will be held for the three SOs in the second week of October. The program will be held at the IMTI headquarters and conducted by a mix of staff from IMTI and the MDPU PIM and training consultants. The Mission reviewed the training modules that were prepared by the staff of IMTI for the introductory orientation program and provided detailed comments and feedback for revision. *IMTI in conjunction with MDPU is to revise and finalize the training modules prior to the orientation sessions in October*. As per the necessary terms of their contracts, each of the SOs will be responsible for bearing the cost of the three-day orientation. However, the Mission finds that it is necessary that all members of the SO teams including the team leaders, the community organizers and *all* of the para workers attend the orientation. MDPU in conjunction with IMTI is to finalize the unit cost per head of attending the orientation program. The WRO PIM cell is to communicate the details including costs of the orientation program to the SOs at the earliest. Similar orientation programs are to be conducted for the remaining SO packages under phase I and II once they have become operational. The mission visited IMTI in Trichy to become more familiar with the work and history of the Institute, and to assess the logistical facilities for conducting training on the scale anticipated. These facilities are viewed to be fully adequate.

77. Based on initial findings from the field, the Mission finds that the introductory orientation programs for the SOs is not sufficient for them to adequately perform all WUA capacity building activities within their respective basins. Therefore, the Mission recommends that a series of in-depth and detailed trainings on water management, long-term water vision for the community, changes in agriculture and household practices to conserve water, decision support systems for water distribution, among other trainings on PIM are necessary for all ten SO packages under phase I and II. IMTI has conducted similar training utilizing specialists from the Center of Excellence for Change Management (CEC). Based on the success of those trainings and following from recommendations in the February 2011 Mission Aide Memoire, the Mission proposes IMTI to hire the services in the form of a Memorandum of Understanding (MoU) of the Center of Excellence for Change Management (CEC) to conduct this additional in depth training. CEC has unique experience in Tamil Nadu with in-depth training of government departments, NGOs, and farmers on sustainable water management practices at the community level. To move this forward in accordance with the demonstrated needs of the Project, the Mission recommends CEC be hired by IMTI to prepare detailed training manuals for WUA capacity building and to design and conduct a series of in-depth training workshops for all ten SO hired for phase I and II packages. The approximate budget for carrying out these activities is $90,000. *IMTI is to submit a detailed proposal and budget, including Terms of Reference for the services to be rendered to the Bank for review and clearance by early October.*

78. *WRO Training*: Based on discussions with Assistant/Junior Engineers who are the competent authority officers in the field and officers of the WRO in the PIM Cell in Chennai, the Mission learned that several new officers have been deployed into the sub basins of the project with little to no training on the TNFMIS Act, PIM, and their responsibilities as competent authorities to the WUAs. As a result, there is little awareness among the officers on how to work with farmers on WUA capacity building activities and there is little awareness on how to work with SOs that are to be deputed to these regions. The Mission was informed that there are about 150 officers who will be the responsible competent authorities of the WUAs where SOs will begin working in Phases I and II. In addition, according to the WRO training cell, which is responsible for coordinating training of WRO officers under the project, there is approximately $240,000 unspent allocation for training. The Mission, therefore, strongly recommends utilizing these unspent funds to conduct a new set of trainings for all of the competent authority officers in each of the basins where the ten SOs are to begin working under phase I and II. This training should include aspects of PIM and WUA capacity building that goes beyond introduction to the Act to teach competent authorities their role and responsibilities on how to work with farmers to ensure the long-term sustainability of WUAs in the state, particularly as these officers will continue the capacity building efforts of the SOs once they have completed their 30 month contracts. *The Mission held detailed discussions with the Engineer-in-Chief (E-in-C) of the WRO on the need for this training. The WRO training cell is to submit a detailed proposal for the training of the competent authorities of the WRO through the MDPU Project Director to the Bank for review and further action by October.*

79. *WUA matching grant proposal.* The mission discussed the proposal from the Project for implementing a matching grant program to support WUA development. The matching grant approach is in lieu of the original project design calling for construction of buildings and other investment in WUA assets, which is viewed to be inappropriate at this time. In light of the above identified issues concerning basic WUA organization and operation, and the lack of adequate capacity to support from the competent authorities, it was agreed to hold off on consideration of the matching grant idea until basic competence in the field to administer and utilize such a program is in place.

80. *Strengthening WRO PIM Cell*: The Mission in conjunction with MDPU PIM staff discussed with the WRO PIM Cell the need to strengthen the state PIM Cell and regional units. Currently, in addition to the PIM Cell under the coordination of the EiC there are four regional offices of the PIM Cell in Chennai, Madurai, Trichy and Coimbatore. There are only three staff (one executive engineer, assistant executive engineer and assistant engineer) responsible for PIM activities within these units. The Mission learned that these staff are not exclusively dedicated to the PIM and WUA capacity building activities in the State and have insufficient training and knowledge on how to carry out their responsibilities. The Mission finds that the detailed recommendations of the February/March 2010 Mission Aide Memoire, paragraph 49, to strengthen the PIM Cell and regional units have not been implemented at all to date. The PIM Cell and units continue to be staffed only with engineers rather than multi-disciplinary teams. The Cell and units do not have the adequate skills for guiding, monitoring and building the capacity of WUAs and WRO competent authorities in the state. As the WRO PIM cell and regional units are responsible for long-term WUA development, vision, and policy advice to the government, it is essential that this Cell be strengthened for sustainability of PIM in the state.

The Mission held a meeting with the Secretary Public Works Department, the WRO EiC and the PD MDPU to highlight these concerns and the need to address this issue during the remaining eighteen months of the project period. *The Mission recommends that the WRO PIM Cell prepare a detailed proposal and budget for future strengthening of the PIM Cell and regional units to the WRO EiC and Secretary PWD for necessary review and action.* This proposal should include details of hiring multi-disciplinary experts into the PIM Cell and units, deployment of full-time WRO staff and young officers who are trained in WUA capacity building and PIM activities, and development of more PIM units at the regional and divisional level with adequate authority to carry out all necessary tasks for WUA support throughout the state.

81. The Mission learned that five of the ten SO packages for Phases I and II have changed the composition of their teams and key personnel. Based on discussions with Bank procurement specialist, the Mission recommended that certain clarifications be obtained by MDPU procurement from the concerned firms prior to Bank clearance. These include: a) whether the replacement is necessary and beyond the reasonable control of the consulting firm, b) whether the consulting firm has certified that the names of the persons being replaced were included in their original proposal after confirming his/her availability for the period of the assignment, c) that there will be no changes in the remuneration to be paid to the person being proposed as replacement, d) that the consultant shall have no claim for any additional costs arising out of or incidental to this replacement, and e) that the MDPU procurement is in agreement with these replacements. *MDPU is to obtain clarification on these points and revert to the Bank with the necessary details at the earliest.*

V -- Component D –Water Resources Management

82. *SWaRMA.* The Mission held discussions with the newly appointed SWaRMA Director who is also the Chief Engineer and Director of the Institute of Water Studies, Engineer-in-Chief of WRO and related WRO staff on the progress of implementation for SWaRMA in Tamil Nadu.

83. SWaRMA staff informed the Mission that the structure for the Executive Wing has been revised to include membership from multiple line departments. A proposal suggesting the inclusion of members from other line departments (e.g. TWAD Board, Tamil Nadu Pollution Control Board, Agriculture Engineering Department, etc.) to constitute membership of the Executive Wing of SWaRMA has been sent to the Tamil Nadu government officials for review and sanction.

84. SWaRMA staff presented a work estimate abstract for the operations of SWaRMA along with budget details to the Mission. This included details of the establishment of the SWaRMA office and necessary items to operationalize the SWaRMA headquarters and details of the hiring of staff. The SWaRMA staff informed the Mission that several line departments were not able to send staff on deputation due to shortages in staff within their departments. The Mission recommended that the SWaRMA officers attempt to engage line department staff on secondment if possible otherwise they can hire necessary retired experts from various departments to fill the posts of the staff of SWaRMA. In addition, the Mission recommended

that a social scientist needs to be included into the list of experts to be hired for the SWaRMA staff in addition to a socio-economist expert.

85. SWaRMA staff informed the Mission that they are in the process of hiring a consultant for designing a web-based database of information on all of the river basins in Tamil Nadu. *The Mission recommended that the finalized ToR for hiring of the consultant should be submitted to the Bank for review and clearance by the end of September, which has not been received as of mid-October.*

VI – Component E – Project Management

86. The mission was briefed by the M&E Consultant on the progress of that work. The draft Baseline was submitted to the MDPU in July and the final version was to be submitted by the end of September 2011. A draft Mid-Term Report was submitted to MDPU in August and reviewed by the mission. The MTR covers Phase I sub-basins for which a proper Baseline was not possible and for which two years performance following initial Project interventions is available. The MTR aims to address key project indicators included in the PAD.

87. The MDPU explained that the Consultant is working on finalizing the MTR and that the final version was to be ready by October 5. Review of the draft document shows multiple inconsistencies that will need to be resolved in the final version. For example, there are conflicting data presented on the question of gap area, irrigation intensity, and cropping intensity. Further, the draft MTR does not in fact address all the indicators it sets out to include. It is important that for subsequent work, agreement is reached on fully covering these indicators. These have to do primarily with crop demonstrations and other technical innovations, as well as the marketing innovations, included under Component B.

88. A number of other Impact Studies have been carried out by the M&E Consultant. The mission reviewed two of these – "Special Studies of Selected Tanks" and "Trans Tank Economic Case Study". While the first of these may have been a useful introductory rapid assessment tool, at this point the mission feels that the Consultant should concentrate on reliable quantitative analysis of project indicators. The second study, above, in particular, is of little value added for the purposes of monitoring and evaluation.

89. The importance of adequately capturing indicators for performance of the line departments under Component B is underscored by the fact that there is no alternative source of third party verification for this portion of the Project.

90. The mission was briefed on the progress under the EIMS contract. The contract was signed June 29, 2011, and work is now underway. A Workshop was held August 9 in Coimbatore to provide input to development of the MIS application. A program of work and deliverables has been agreed with the MDPU for the remainder of the Project. The initial pilot version is scheduled for delivery at the end of October 2011. It was agreed that the mission will provide the ICT specialist for support in reviewing development of the application starting in November.

VII -- Environmental Safeguards

91. Overall the mission is pleased to note that the Environmental Cell (EC) is making efforts to continuously improve the quality of its supervision, reporting and documentation. The use of local NGOs in this respect has been a good idea. After field visits, feedback from a large number of project beneficiaries and discussion with NGOs and line departments, the mission recommends that the EC should : (i) undertake awareness building programs for MDPU staff, project engineers and line department officers to sensitize them towards environmental issues; (ii) award the external audit consultancy at the earliest; (iii) start measuring the positive environmental impacts of the project; and (iv) develop a pilot, in consultation with WUA, to cultivate medicinal/herbal plants on canal bunds and slopes. A summary of the field visit observations and interactions with stakeholders is provided in Annex 4.

The following agreements were reached during the mission:

Agreement	By Whom	By When
Share with the Bank a draft outline of Sub-basin Environment Atlas (including the report structure and nature/scope of content)	Environment Cell Division	November 30, 2011
Share with the Bank a brief concept note for a pilot on cultivating medicinal/herbal plants on the canal banks and slopes though the WUA.	Environment Cell Division	November 30, 2011

VIII -- Financial Management

92. **Disbursements:** The project has been timely in the submission of the quarterly IUFRs and disbursements have been made for expenditures reported till quarter ended March 2011. The disbursement under the project is as under:

Financing from	IDA	IBRD	Total
Allocation	157.35	335.00	**492.35**
Disbursed *	141.74	57.70	**199.44**
In pipeline with project **	4.64	0.49	**5.14**
Total Disbursment	146.38	58.19	**204.58**
% Disb.	93.03%	17.37%	**41.55%**

* includes SA-Advance of USD 8.00 million under IDA and USD 17.00 million under IBRD
** Claims in pipeline with the project (relating to the quarter ended June 30, 2011)

93. **Financial Management: Budget & Funds Flow**: The budget for the financial year 2011-12 is Rs 4101 million which is adequate for the current year. There have been no constraints in funds availability (including issue of LOCs to WRO) with various line departments / agencies.

94. **Accounting, Financial Reporting and Internal Control**: Since the previous mission the project has (a) shared the internal audit (IA) reports VIII and IX; and (b) submitted the IUFR for the quarter ended June 30, 2011. The MDPU is receiving monthly expenditures reports from all the line departments/ sub basins and has also received (through the Finance Department) the expenditure as recorded in the books of the AG for the year ended March 31 2011. The MDPU has identified significant differences in the expenditures reported by Horticulture Dept (short reporting) and Agriculture Engineering Dept –AED (excess reporting) as compared to expenditure recorded by the AG for the year ended March 31 2011. While the excess reported figure for AED has been adjusted in the June IFR, for the Horticulture Dept the MDPU is awaiting the final AG reconciliation certificate to claim the short expenditure. This will be adjusted in the Sept 2011 IFR. A meeting of all the nodal officers (TNIAMWARM cell) in 8 line departments was held to re-enforce the need for quarterly reconciliation with the AG; the mission also met the accounts staff and the Commissioners of Horticulture and Agriculture to agree on further streamlining the process of collation of expenditures from sub basins and reconciliation of the same with AG. *In view of the large turnover of staff at various sub basins, it was agreed that the MDPU will provide a re-fresher training on financial management aspects to all the Phase III sub basin staff.* There has been some progress in the settlement of advances relating to WUA elections and procurement of drugs & training respectively aggregating to approx Rs 65 million. It was agreed that the same will be fully liquidated by December 31 2011.

95. **Internal Audit**: There are no critical observations in the internal audit reports No VIII and IX that have been shared since the previous mission. The repeated issues that are being highlighted by the auditors include: (a) non deduction of TDS and delays in filing of TDS returns; and (b) insurance for insufficient period of sum by the contractors. MDPU has held tripartite meetings to resolve audit issues, especially those relating to variance in sub-basin wise expenditures reported in the IA reports, as compared to the figures reported to MDPU and those by the AG. The tripartite review indicated that while the overall figure of is correct, there have been instances of expenditures of one sub basin reported under another. This is because while the unit of accounting is by districts/ divisions, the reporting is by sub basins and this causes some confusion in the districts/ divisions which are carrying out activities of more than one sub basin.

96. The current contract of the internal auditors is expiring in Nov 2011. Based on experience of the last 3 years it is suggested that the revised scope may focus only on large spending departments i.e WRO, Agriculture, Horticulture, TNAU and AED. The revised TOR should include (i) sample verification of beneficiaries and assets provided including its utilization; (ii) payment of farmer's share of subsidy to vendors (drip irrigation etc) and (c) sample audit of grants to WUAs. It was agreed that the revised TOR will be shared with the Bank by Sept 30, 2011 and EOI will be issued by October 15, 2011.

97. **External Audit**: the project has submitted the financial statements for FY 2010-11 to AG for audit only in September 2011, with reconciliations pending for a few line depts. This is likely to delay the submission of the audit report beyond Sept 30, 2011. It was agreed that the FY 2010-11 project financial statements should include a schedule of retention money on completed contracts (sub basin wise).

98. **Grants proposed to be provided to WUAs**: the mission held preliminary discussions of the financial management aspects of the proposed WUA matching grant scheme. As noted above, this issue can be revisited once the necessary capacity is in place in the field to carry out such a program.

Agreed Actions

S.No	Actions	Date by	Responsibility
1	Refresher FM Training to all Phase III sub basins	October 31, 2011	MDPU
2	Internal Audit: Submit proposal for selection of internal auditors along with revised TOR and coverage for approval.	Sept 30, 2011	MDPU
3	Advances: Follow up on settlement / refund of unspent balances of advances for WUA Elections (WRO) & to TNMSC/ TNLDC.	December 31, 2011	WRO/ MDPU

IX -- Procurement

99. A new staff has recently assumed the charge of the post of "Head Procurement, MDPU" as the earlier incumbent of the post has been transferred on promotion. It was observed that the new officer is well experienced in procurement procedures followed in Bank financed projects, particularly in TNIAMWARM, as he has earlier worked in MDPU for several years and has also obtained procurement training at ASCI Hyderabad. He is now providing procurement training to the staff of Agriculture and Horticulture Departments by organizing two day workshops. Five such workshops have been completed in which about 150 persons received training. Three more such workshops are being planned.

100. Due to change of staff in implementing agencies, further procurement training to the new staff has become necessary. Moreover the procurement activities are starting in Phase IV sub basins and it is necessary to build procurement capacity of the staff of these sub basins also. It was decided that the project will arrange for procurement training either by the experienced staff of the project or by hiring a suitable resource person.

101. DoA will now have no difficulty in procuring fertilizers through competitive bidding process as the Government control on the fertilizer prices has been lifted.

102. The Bank had provided no objection subject to comments for the procurement plan of the Agriculture Department for Phase III and Phase IV sub basins for 2011-12 through e-mail of August 22, 2011. Two more procurement plans for the same implementing agency for the same period for Phases I, II, III, and IV (for additional activities) were received in the Bank on September 08, 2011. i.e. the procurement plans are still being sent in piece meal manner. The matter was discussed in the light of the decision taken during the last implementation support

mission (February 2011) wherein it was decided that the procurement plans sent to the Bank for review and no objection should be sent in consolidated form, i.e. each implementing agency should have only one consolidated procurement plan for one year which could be updated periodically. It was decided after discussions with Head Procurement and the representative of DoA that the Procurement plan for which no objection was provided on August 22, 2011 shall be updated and sent for Bank's review by the end of September 2011. The requirements of agriculture implements and equipment, e. g. Hand Operated Sprayers, Power Operated Sprayers and Conoweeders shown in the procurement plans as several shopping packages shall be reviewed and procured through NCB by clubbing the requirements as the cumulative estimated cost of this equipment is considerably high.

103. The procurement of Conoweeders by TNAU was discussed. The draft Amendment to the bidding document prepared by TNAU as a result of pre bid meeting was reviewed and necessary clarifications were provided to the representatives of TNAU. Bank suggestions for the draft minutes of pre bid meeting were also discussed and changes suggested.

104. The Head Procurement was advised to send the list of post reviewed contracts awarded by implementing agencies during the period July 01, 2010 to June 30, 2011 so that the work of post procurement review could be started. He was also advised to send project's replies to the observations of GPCL recorded during PPR for the contracts awarded during 2009-10. *It was agreed that the information will be sent to the Bank before September 30, 2011.*

105. A few procurement issues were discussed with the representatives of implementing agencies and necessary guidance was provided.

106. Keeping in view the observations raised in PPR reports, the procurement rating continues to be "Moderately satisfactory"

Annex 1 -- Agricultural Marketing

Field visits

The project is claiming to have formed some 1470 commodity groups, involving some 38,600 farmers, with some 1000 MOUs and a turnover of sales of some $ 38 million, with an aggregate incremental income of some $ 2.8 million generated. Ultimately, if the program continues as envisaged, it will reach some 50,000 beneficiaries.

Commodity groups, as observed in the few examples visited in the field, appear to be a success, and provide a foundation for future growth. The key elements are (1) farmer involvement and commitment (2) unleashed excellent examples of empowered groups seeking out markets, more profitable opportunities.

There is very strong justification to expand the program, using existing examples to accelerate the emergence of new commodity groups and enabling them to learn the lessons from the better CGs. This justifies a major effort, and should be supported by a graduation approach for CGs to be provided with matching grants for the choice of their own (initially limited) own investment, and to be able to support successful CGs with additional funding combined with a higher percentage of contribution by the emerging CGs themselves.

Drying Floors

Currently some 144 drying floors have been created under the project. Another 50 are anticipated. Mobilizing these investments, however, hasn't been easy. These can be built on Panchayat land, but this process can be difficult both in terms of finding suitable sites and gaining the necessary approvals. The alterative is if a community member donates land, but the current regulations require that they sign over the land to the Government, if public funds are going to be invested. This is a major disincentive.

Drying floors are being provided by other agencies i.e. Dep't of Rural Development, and the Marketing Committees. But many argue that village based drying floors are in strong demand, as evidence by the level of road drying

No very clear impression emerged during the field trip of the utilization of drying floors. In one ABC – by using the income generated, it appears that the drying floor was only used to dry some 13 tonnes of groundnuts in the last 12 months. Other calculation suggests that if properly / fully utilized that a drying floor should be able to dry some 400-500 tonnes of product per year. It appears that a drying floor is likely to have a much higher utilization when it is an integral part of a rural community rather than located at a separate ABC.

ABC does not aim to generate funds to cover maintenance and deprecation of facilities. The charges for services by ABC are well below those of the private sector. The ABCs run the

danger of crowding out the private sector with costs that are unsustainable financially, but this approach will only generate a short term benefit while the subsidized equipment and services continue. But without any attempt to cost recovery there is the prospect that once the utility of the project supplied technology is finished, that the private sector will not be able to step in to deliver needed services and supplies.

Private Sector Charges as Against Those of ABC

	Private Sector	ABC Centers	
Power Tiller	Rs 1200/acre	Rs 600/ acre	Half prices
Maize Thresher	Rs 50/ 100 Kg bag	Rs 14 / 100 Kg bag	One third charge
Grain Storage	Paisa 10/bag/day	Paisa 30-40/bag/day	One third to 1/4 of private charges
Transport (long distance)	Rs 300/bag	Rs 200/bag	Private transport +50% costs
Transport (collection)	Rs 5 /bag	Rs 20 / bag	ABC undercuts by a factor of 4

The unit investment costs and an estimate of basic depreciation costs are set out below.

Investment Costs

			Size	Unit Price			Dep. @ 5%	Dep. @ 5%
Drying Yard	$	8,333	400	$ 21	m2	$	417	Rs. 17,500
Storage Shed	$	14,286	80	$ 179	MT	$	714	Rs. 30,000
Collection Center	$	14,286	100	$ 143	m2	$	714	Rs. 30,000
Ag Biz Centre	$	59,524	500	$ 119	m2	$	2,976	Rs. 125,000
Moisture Meters	$	357		$ -	each			
Scales	$	286			each			

The Project's Moisture meters cost some $ 350 each. Some cheaper alternatives are set out below.

Prices of grain moisture meters in developing countries are generally lower – see examples below.

Miscellaneous worldwide manufacturers

National Instruments digital moisture meter from Vadodara, India, used in the Andhra Pradesh project prices range from 4163 Rs. (US$94) for one item to 5850 Rs.(US$132) for eight items (see price list)

IRRI moisture meter for paddy

Currently (August 2010) the moisture tester Mark II is produced by two small workshops in Los Banos in the Philippines. Quality control is done by IRRI, which means that production numbers are still limited. IRRI is looking for manufacturers who would be interested in producing the moisture tester locally. The IRRI moisture meter can be purchased in the Philippines at the IRRI Riceworld Bookstore. The IRRI low-cost moisture tester is a decision making tool for postharvest operations that costs only 1/4-1/2 of the price of a more advanced moisture tester.

Overview

In simplified terms, the project has had two main interventions. Firstly, the formation of Commodity Groups (CG), along with some on-going support, mainly in terms of training, investment and technology. Secondly, in the creation of Agri Business Centers (ABCs) with an initial focus on shared infrastructure (drying floors, collection centers, storage).

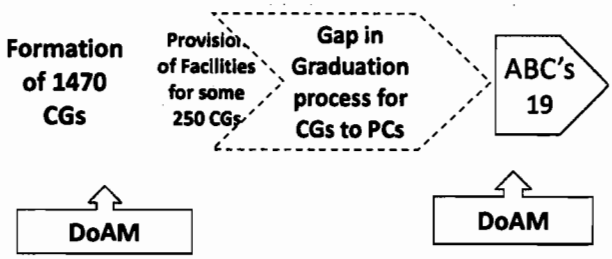
In so far as is possible in limited field observations, it appeared that the formation of some 1470[4] CG has unleashed a tremendous surge of initiative, entrepreneurial dynamism and the empowerment of farmers to, collectively, seek out new ways to increase their profitability. There is a gap currently in the project's ability to assist CGs to migrate, progress and develop commercially

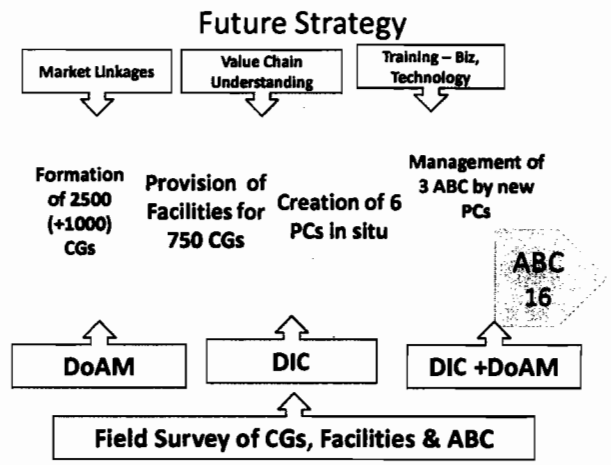
The story on AgriBusiness Centers (ABCs) is far less positive. At their current stage in development the ABCs' records provide (1) no evidence of high utilization[5], (2) financial sustainability and, (3) any movement towards management and operation of the ABCs' by Producer Companies, as envisaged in the project design.

[4] In aggregate amounting to some 38,600 beneficiaries.,

[5] In the ABC visited the utilization of facilities appeared to be in the range of 10-15%, and the funds generated would not even cover the bare minimum of a 5% Depreciation charge

Over view





The future program will:

1. Focus on accelerating the formation of new CGs, by DoAM,
2. Support existing CGs to develop, in primary value addition by DoAM and into processing by DIC,
3. Assisting in the emergence of Producer Companies,

This process will be supported by

1. Market linkage programs both by DoAM and DIC,
2. Detailed Value Chain studies of selected important enterprises
3. Training in Business and Technology
4. A monitoring and an evaluation of the progress and lessons from the existing marketing interventions

Outline TORs

Survey of the mobilization and development of existing Commodity Groups and the Operation and Management of Agricultural Business Centers

Conduct a survey of a random sample of existing 30 CGs, including at least 10 drying yards, 7 stores and 3 collection centers, will be carried out under a consultancy contract.

The objectives are to learn;

(1) Perception of beneficiaries of the existing process of CGs mobilization, training and resource allocation, with the focus on reporting on the lessons of effectiveness and potential for improvements in methodology

(2) A calculation of economic benefits to date generated,

(3) Make an assessment of the CGs' likely sustainability with reference to their

(i) Financial record keeping and future FM planning,

(ii) The effectiveness of the CGs' management,

(iii) Existence of a sensible forward plan for CGs' business development

(iv) The role, or otherwise, of ABCs in the CGs development and function,

(v) Future strengthening needs.

A study will be made of a random sample of 6 ABCs, including at least with 3 drying yards, 3 grain stores and 2 collection centers.

The objective will be to generate lessons on:

(1) The level of utilization of drying floors, crops stored, volumes traded from collection centers, level of activities of the input supply shops and number of farmer benefited,

(2) The economic benefits to date generated,

(3) An assessment of the ABCs likely long term sustainability at existing levels of operation ,

(i) Evidence of progress towards transfer of management to PCs,

(ii) The role of the ABCs' in the broader context of agricultural development , i.e. Information, extension, mechanization,

(iii) Survey of CG members in the ABC catchment area as to their perception of the ABC existing and future role and importance.

This work can be carried out either by the existing M&E consultant or a specialist consultant and will be contracted and supervised by the CMU. The results of this program will be used to inform the formation of new CGs and the development and graduation of existing CGs and the future development of ABC, and the transfer of management of these facilities to Producers companies.

Post Harvest Study

A study will be commissioned to provide greater insight into post harvest needs and the impact of investment in post harvest infrastructure. This will work include a study of

(i) the utilization and need of drying floors,
(ii) comparison of the quality, price differences of product dried in drying yards as compared with road dried,
(iii) the range of moisture contents of product traded,
(iv) the impact of moisture meters in reducing moisture content variation, and
(v) An assessment of the economic benefits of drying floors, rurally based stores and moisture meters.

This work can be carried out either by the existing M&E consultant or a specialist consultant and will be contracted and supervised by the CMU. The results will be used to inform the future investments in drying floors, moisture meters and storage systems

Value Chain Study

The objective of the study will be to inform the process of exploring new market opportunities, agricultural diversification. The CMU will commission 5 value chains studies. The focus will on those enterprises viewed as being important and with significant growth potential.

Each study will cover, but not be limited

(i) Market demand in terms of size, historical growth and future trends
(ii) Breakdown between market segments
(iii) Assessment of alternative marketing channels
(iv) Product specification e.g. grading, quality, packaging, taste
(v) Pricing and competition
(vi) Identification key choke points on growth in the value chain
(vii) Identification of and database of key stakeholders in the value chain.

Annex 2 -- Livestock

The mission visited 19 villages located in 12 sub-basins and interacted with farmers, farmers' groups, and members of the WUAs, implementing AHD officers, and participated in farmers' interactive meetings and animal infertility and health care camps in order to observe, get feedback from the farmers and implementing officials, and offer suggestions for project improvement.

Until phase- III, the AH activities are being implemented in 44 sub basins, and during phase IV (FY 2011-12) the activities will be extended to another 5 sub basins totaling 49 sub basins. The achievements against the given targets (as reported by the AHD) and the field visit give the impression that the various activities implemented under the animal husbandry component are yielding the desired outcomes. The claimed achievements needs a cross validation for its accuracy , and the regional variations in implementation, level of adoption, results achieved, and the spread of impact among the small and poor farmers and the women need to be monitored and documented. Considering the volume of activities and constraints in man power at the field level, it may be advantageous to engage one officer exclusively for program monitoring at the office of Regional Joint Director.

Interaction with the individual farmers, farmers' groups and members of the WUA, and the visible impacts gives an impression that the AH department is able to create a niche among the farmers of the sub basin area visited due to their frequent visit and continued interaction. In many of the visited sub basins, there is considerable level of involvement and coordination among the district level functionaries starting from Joint Director, Assistant Director of Animal Husbandry down to field level veterinarians and their sub ordinates. The team approach followed in various phases of the project implementation has contributed greatly to the overall achievement of the given targets.

Overall performance

Animal Husbandry Department reports a near cumulative achievement for the Phases I, II and III (FY 2007-08 to 2010-11) in many of the activities

- 99% achievement in number of AI performed, 99% in fodder development , 100% in regards to Azolla demonstration, farmers interactive meetings, fertility cum health care camps, farmers training , exposure visit to farmers and sheep and goat deworming. The establishment of cluster WUA veterinary units is only 57% (40 centre against the target of 70). The reason quoted is non-availability of veterinarians due to low honorarium.

- Till the end of phase III (FY 2010-11) the project was able to produce 295,194 calves, of which 147,961 are female calves against the overall projected target (in all 4 phases) of 166,000 lactating crossbred cattle. Considering the prevailing calving rate in the project area (53% as reported by AH department) the project will be in a position to produce

218,625 female calves from the AI carried out till the FY 2010-11 alone. With a targeted calf mortality of 10% in female calves and 5% in adult mortality, a total of 185,831 lactating animals will be available in the project area from the AI carried out till phase-III.

- Against the targeted annual milk production increase of 300,000 tons for the FY 2010-11 the estimated milk production increase is to the tune of 305,000 tons in 44 sub basins. The total estimated annual milk production in the project sub basin is 2038, 000 tons for the FY 2010-11

- The cumulative financial utilization up to FY 2010-11 is 84% against the sanctioned financial outlay of 18.25 crores and 68% against the DPR. The reasons reported for less spending are due to unspent honorarium of the vacant WUA cluster veterinary units and the savings accrued out of purchases through lowest biddings.

- The reported AI and calving are captured through the manual reporting system followed by the AH department, which requires a review. The reporting system needs computerization with appropriate animal identification and cross verification system in place in order to ensure accuracy and transparency of the achievements claimed. Sub basin wise analysis and specific interventions to address issues related to specific sub basins should be taken up. Fodder development activity has motivated many farmers to move towards dairy farming.

Fodder Development

The fodder development activities are showing largest impact in terms of helping the farmers who wish to intensify their dairy farming. For example, Mrs. Thangam Sivakumar of Ammur village in Poiney sub basin, a sole earning member in the family was successfully able to enhance her family income by the fodder development programs initiated under the project. 1600 Co-3 root slips supplied for fodder cultivation in 10 cents in 2008-09 motivated her to extend the area of fodder cultivation and increase her herd size from 1 animal to 3 animals. The fodder cultivation she claims is less labour intensive compared to crop cultivation in the backdrop of labour shortage. Mrs. Thangam is comfortable in moving towards dairy based livelihood by increasing her herd size and area of fodder cultivation. The timely availability of veterinary, breeding and advisory services offered by the nearby AHD veterinary institution are adding to her confidence. The only constraint she claims is the non-availability of organized milk marketing facilities that could ensure transparent milk procurement and timely payment.

Although the fodder development activities have helped many farmers to increase their earnings, the adoption is highest (almost 100%) among the farmers who are intensifying their dairying in their mixed farming systems. The adoption rate among the small farmers who wish to maintain few animals seems to be low (30-50%). For example many of the small farmers who were supplied with Co-3, have switched over to other crops and vegetable after taking few

cuttings. The major reason quoted is water shortage during summer months. This is an observation, and a system need to be in place to follow and record the details of farmers who successfully maintain the fodder plots and the reasons for non adoption. The project could consider the following for improving the efficiency and sustained adoption

- The selection of fodder species and varieties should be region specific given the agro eco conditions and water availability. Efforts to be made to supply root slips at the onset of monsoon so that the survival rate improves. Equal consideration should be given for drought resistant species like Kolukkattai grass (Cenchrus sp) and Stylosanthus. If annual varieties like sorghum is considered, timely seed availability in the villages to be ensured.

- Intercropping and bund cropping with tree fodder species like Sesbania need to be promoted on a larger scale. Promoting Subabul needs reconsideration due to its invasiveness and probable negative effect on the eco system

- Farmers expect credit facilities for establishing water saving techniques like installation of sprinklers, rain guns and drip irrigation systems. Presently banks do not lend money for fodder development investments. Appropriate policy instruments could be negotiated with banks for extending the credit facilities for fodder development activities

- Fodder conservation and enrichment programs such as urea treatment, small scale silage and hay making should be encouraged with appropriate follow up mechanisms. The issues related to success of these interventions should be documented on continuous basis and immediate remedial measures should be suggested.

- There is an improved awareness among the farmers in respect to use of chaff cutters to improve the efficiency of fodder utilization. But the local availability and credit facilities pose a constraint in adopting the technology. AHD may consider developing appropriate strategies for establishing linkages between manufacturers, farmers and credit institutions. There are efforts to put up community owned chaff cutters, but the practical issues related to mobilizing fodder to a common place, time allocation for each farmers and taking back to the farms pose major constraints in efficient use of this system.

- Adopting Azolla cultivation is very limited. Barring few adoptive and innovative farmers, many failed to maintain the established Azolla units owing to reasons like failure of growth, flooding during rainy season and difficulties in repeated washing before feeding. In spite of this few farmers (in Abhinav village) have innovatively designed azolla tanks to prevent flooding and efficient growth. The demonstrations and trainings should clearly explain the importance of each of the process in azolla cultivation. There should be a continued follow up with the farmers to ensure success.

- Efforts need to be taken to educate the farmers on balanced feeding. Many software programs helping the farmers to work out a balanced and least cost rations are available, which could be used to demonstrate and plan a balanced nutrition for their animals using locally available feed and fodder ingredients

Breeding interventions

Interventions in breeding has satisfactorily achieved its objective of door step delivery of AI, improving conception rates, reducing fertility problems, and better calving rates. As reported the conception rates have improved from 48% (in 2007-08) to 55% (in 2010-11). This is commendable in the backdrop of national averages ranging from 30 – 40%. Again the emphasis is to capture the data more accurately and cross validate. Organizations like National Dairy Development Board (NDDB) has developed software (INAPH – Information Network for Animal Productivity and Health) to capture breeding, health and feeding information more accurately. Such systems could be put in place for an efficient MIS.

Even though the conception rates are at satisfactory levels, the observation indicates need for improvements in AI procedure at the field level. There should be a uniform Standard Operating Procedure (SOP) for AI practices to be prepared and circulated for better conception and prevention of microbial contamination.

There are issues related to procurement and timely supply of frozen semen and liquid nitrogen, which requires a critical review. It was learnt from the AHD officials that the minimum milk production criteria prescribed for selection of bulls pose a constraint especially for crossbred bulls, as there are only few semen stations in the country that have bulls with the prescribed milk production levels. AHD may consider revising the criteria based on the availability in the country. Emphasis should be placed on semen station grade, quality of semen and the process of bull selection rather than production figures. It should be kept in mind that the majority of semen stations in India do not procure bulls through a systematic genetic selection programs like progeny testing or pedigree selection and hence the milk production figure as claimed by the semen stations may not be accurate. Therefore combining the parameters like process of bull selection followed by semen stations, semen quality and deciding on the cut off level for milk production from the top available bulls would ensure a sustained genetic improvement in the population.

Few of the farmers interacted placed demand for frozen semen of the indigenous cattle breeds which are suited to resource poor and stressful environmental conditions. Moreover some of the farmers prefer these breeds for specialized production systems like organic dairy production. AHD also have appropriate breeding policies in promoting indigenous cattle breeds. So, there should be efforts in making available the required semen doses of the indigenous dairy and dual purpose breeds. Organizations like Rajasthan Cooperative Dairy Federation (RCDF), Banaskantha Milk Producers' Cooperative Union Ltd (Banas dairy), Sabarmati Ashram

Gaushala (SAG), and Animal Breeding Centre (ABC) are producing quality semen from the indigenous bulls procured through systematic genetic selection programs. These organizations could be approached for procuring semen of the desired breeds.

Infertility camps are largely a successful and as reported 60% of the infertile animals became pregnant due to the timely and simple interventions. Records and animals verified during field visits support the same. Many farmers interacted appreciated these programs as the intervention in fertility problems of their animals helped to prevent the losses of selling an infertile animal. These camps need to be strengthened in terms of increasing the quantity of required medicines and funds for publicity and mobility. AHD may consider revising the budget allocated for each camp. Since infertile animals require follow up over a period of time, there should be provisions to provide sufficient medicines for further treatment. The infertility camps gather large number of famers and this opportunity could be utilized to spread better animal management, feeding, breeding and health practices using audio visual aids and posters. AHD may consider strengthening these activities through provision of modern diagnostic equipments like ultrasound scanners which could aid in accurate diagnosis of infertility problems and early diagnosis of pregnancy, which could save time and money for the farmers.

Veterinary Services

The entire spectrum of project activities are implemented through 770 veterinary institutions and 40 cluster WUA veterinary centres. Preventive animal health services like vaccination and deworming of calves, sheep and goats and other curative veterinary services are provided through these veterinary institutions. There is a widespread appreciation among the farmers for these services. The set targets are also achieved to hundred percent levels.

It was observed that at the district level the AHD is well equipped with diagnostic facilities such as mineral profiling for animals, antibiotic sensitivity testing and diagnosis of specific blood parasites. These facilities should be utilized by the project implementing veterinary institutions in order to improve the efficiency of treatment and to advise the farmers for specific mineral supplementation.

The bovine population in Tamilnadu is increasingly getting replaced by the crossbred cattle population (applies to the project area as well), which are highly prone to economically important diseases like mastitis. Hence it is imperative to develop appropriate mastitis control program with components of detection facilities for clinical and sub clinical mastitis, isolation and testing of organism for antibiotic sensitivity , designing appropriate treatment and control regimes , training and education of farmers on mastitis management and control.

WUA cluster veterinary units

The WUA veterinary units were established with an objective of developing a self sustaining serving institution on commercial basis. It was learnt from the AHD officials that

there is a high turnover of veterinarians in these institutions. The project could successfully retain only 40 veterinarians in WUA veterinary centres against the target of 70 units. The reason quoted is the difficulties faced by veterinarians in sustaining themselves through the honorarium and fee charged from the farmer for AI and veterinary services. Availability of better avenues for employment negatively influences opting to join these institutions. It was learnt that the prevailing salary structure for a young veterinarian ranges from 20,000 to 30,000. This indicates that the concept of establishing self sustaining institutions is not an immediate reality. AHD should think of how best these institutions will remain in place after the closure of the project. Either the incentives and honorarium paid to the vets need to be reviewed or other models like mobile AI technician concept could be considered for ensuring an un interrupted basic veterinary and health services to the farmers.

Small ruminants and poultry

Vaccination and deworming program for sheep and goat is the only program targeted at improving the sheep and goat population. Improvements in this sector are pro poor hence majority of the sheep and goats are managed by economically weaker section of the society. Therefore equal emphasis is needed to develop appropriate intervention strategies in terms of feed, fodder, breeding and management. Farmers' field schools with model sheep and goat farms integrating the components of semi intensive stall feeding, management and silvi-pasture systems could be established in each sub units as a learning farm for farmers. Simultaneously the project also could think of performance recording (for traits like twinning, kid mortality, weight gain) for selection of breeding bucks and rams from the existing population, which could aid in faster genetic gain and reduction in inbreeding.

Backyard poultry farming is being recognized as an instrument to enhance economic status of the women and to improve family nutrition. Many women farmers requested to provide assistance in improving their backyard poultry farming through supply of good quality chicks and veterinary care. AHD could think of promoting collective backyard poultry farming enterprise through women self help groups, community hatcheries, collective marketing, etc.

Farmers' Training programs

Trainings are again adopted well among the farmers who are intensifying more towards dairy farming. Although many of the farmers adopting one or two practices like better feeding or clean milk production, it did not motivate them to adopt a package of better dairy farming practices. Exposure visits to a successful farmer within the vicinity of the training place should become part of the training process. Methods such as farmers' filed schools (like the one established at Abhinav village in Salem District) could serve to provide better learning practices by seeing, doing and learning rather than class room based simple theoretical sessions.

Marketing

Marketing infrastructures for milk is available fairly well in the villages of sub basin visited. Still in some of the places the milk marketing is done through informal milk vendors who in many instances exploit farmers. Cooperative milk societies became non-functional in few places due to various reasons. Efforts to be taken to revive such cooperative societies or new models such as producer groups could be promoted for an efficient milk marketing system.

Information system and capacity building

MIS to capture information related to reduction in calf and adult mortality, improvements in fertility problems, fodder production and increase in milk yield to be developed. Appropriate statistical models to be used to estimate the milk production increase in the project area.

In terms of capacity building, the veterinarians and implementing officers need additional trainings in infertility management of cattle, designing fodder development program for specific agro eco region, participatory extension methods like farmers' field school , project monitoring and project management.

Annex 3 – Fisheries

Fisheries component of the IAMWARM project has a target to achieve over 22,000 tons of additional fish / year at the end of the project period. Currently, the production estimates are only within 4000 tons and there is a huge gap between the target and the current level of production. Fish seed continues to be a major deterrent to cover larger number of water bodies and stock them with large size fish seed. The project intervention strategies have been readjusted following the mid term appraisal and accordingly, project should focus heavily on quality seed production in the remaining phase of the project. Keeping this in mind, the present mission was undertaken to assess the overall progress made and with special reference to the progress made in seed production sector. The following brief report is based on the discussion with the project staff, field visits to various project activities during the four days covering basins in Thiruvallur, Vellore and Villupuram districts from 14-17th August, 2011.

(a) Fish culture in farm ponds

Farm ponds under Phase I and II have been utilised for fish culture, closer to the targets fixed. It was reported that several of the farmers continue to do fish culture on their own after completion of the project support. Some of the old farm ponds visited helped to understand that farm ponds have been best used by farmers both as water conservation tanks as well as an area for culture of fishes. In many locations, farm ponds have been used to raise other species of fish besides carps and this reflects the choice of farmers to choose the species that are suitable and economically viable for culture. Some of these ponds can also be best used as nursing areas as projected in the additional DPR and this would greatly help to increase the large size fish seed availability for stocking in tanks.

The ponds under third phase need to be taken from AED and utilize them fish culture. As the money has already been allocated, an early decision on selecting suitable ponds in the project area may be arrived. If this money would not be utilised, because of non-availability of ponds, the amount may be utilised for constructing fish seed nursing centres.

The data base for all the farmers in different phases may be built and information on the culture practices may be gathered by contacting them on mobile and update pond utility regularly. Also, support service to farmers may be provided through mobile phones.

Most importantly, several of the farm pond dikes remain unused except in few cases. However, some farmers have best used dikes planting varieties of fruit crops, mainly banana and other varieties. Such success stories should be recorded and uploaded on web pages. In addition to production of success story about the accomplishments and economic benefits, farmer to farmer contacts may be established through mobile phones.

(b) Fish seed rearing in cages

Cage rearing of seeds has been one of the successful activities that have been practiced from Phase I. The targets fixed under Phase I and Phase II have already been achieved, cages

under phase III are currently being used for seed rearing. The cages are reported being used regularly by farmers to continue seed nursing after with drawl of project support. Information on how the activities has been sustained by farmers may be gathered with adequate information on the number of seed produced, place of stocking and the profit earned. Although, in project areas, some such information could be seen, centralized data base is essential to understand the progress made in the project in different areas. Here again, it is requested to build data base with phone numbers of each of the beneficiary as that can help in many ways. Once all the information of mobile numbers is available, these farmers can be given technical support through mobile phone.

During the field visit many water bodies could be seen and these areas would be best suited for installing cages and undertake seed nursing activities. Fisheries Monitors may be engaged to help farmers with the activities.

(c) Fish culture in cages

Cages installed under NADP scheme in Poondi reservoir were also visited. These cages appear to serve the purpose of both fish culture as well as seed nursing. Currently, these cages designed locally are intended to be used for fish culture. Similar structures can be used for undertaking seed nursing and fish culture by using appropriate mesh size of the net based on the size of fish seed. On a trial basis cages are proposed to be installed for fish culture and the experience gained from the NADP project may be used to develop suitable cages.

Seed nursing space being a major issue , if the technology could be evolved to nurse the seed in cages, it will provide better opportunity to improve fish production. Earthen ponds could be utilised to raise early stages and grown up seed can be further nursed in cages or held back until the water is received in tanks for stocking. This can provide multipurpose opportunity once the fishers are able to get acquitted with the cage culture operation techniques.

(d) Cement fish seed banks

Twelve Cement fish seed banks were built during the I and II phase of the project. Many of these seed banks still remain with the Department of Fisheries and few of them have been handed to water user groups or fishers association. These types of structures have now been not encouraged in view of cost factor and instead earthen seed banks are encouraged to be built. The seed banks in Manimutthar and Kotekarayar suffer from construction defects and / or water supply problems. As a result, these seed banks were not put in to full utility. The data provided indicates that seed banks have been able to achieve seed production to their optimal level, but individual seed banks performance details are lacking. Two of the seed banks visited during the mission were found to be functional and active. One of the seed banks in Villupuram district is managed by the Fishermen Cooperative and it is performing well. Monitors regular visit would help in getting better information about the accomplishments and challenges faced by these centres.

Fish Seed banks that have been improved with the project support were not visited this time. However, it was reported that the farm located in Thattamanaipatti in Pudukottai district has been able to make substantial progress. It is suggested that the Department maintain data base for each of the farm repaired under the project and the seed production activity undertaken.

(e) Earthen seed banks

Earthen seed banks proposed under phase III are yet to be built. However, some of the seed banks that have been built under the NADP scheme were visited demonstrate the viability of earthen seed banks for seed production and rearing. As several such earthen seed banks are proposed to be established under IAMWARM project, it is suggested that the experience gained from NADP be productively utilised to improve production efficiency. Farmers have made innovations to control seepage by using clay. It is essential that proper slope on all sides of ponds and strengthening of dikes with grass must be undertaken on priority. Such measures can improve life span of these earthen ponds besides facilitating easy pond management.

(f) Fish seed rearing in pens

This is a new idea that has been introduced to improve seed availability during the III phase of the project. The project has so far erected 13 pens and it is reported that pen rearing of seed has largely been successful. However, data on the details for each of the pen needed to be maintained. The details pertaining to the management problems encountered in each of the pens and the way these problems have been overcome need to be maintained. Unless, such an effort is made, scaling up of these successful activities would be difficult in addition, it is suggested that the information gathered may be used to develop extension bulletin that can be used as a lesson by others.

(g) Ornamental fish culture units

This is an activity that has not made visible progress since early stage. Among the 9 units established in phase I, it appears that only one unit is functioning effectively and others are confronted with challenges in sustaining the activity. In the second phase, among the 9 units, completion of work is reported yet to be accomplished. In phase III, their none yet to function. It is suggested that the pictorial case study on each of the units built under the project is constructed and follow up support is provided from the central office. It is also recommended not to start any more aquarium units using the additional DPR resources.

However, it is interesting to see that ornamental fish culture is emerging as an income generating activity in different locations of Tamil Nadu. During the mission, some of the nurseries of aquarium fishes were seen in Thiruvallur district. It is suggested that the lessons from these nurseries be used to help the people in the project to undertake aquarium fish culture activity. By linking the farmers with traders who supply the seed for nursing, farmers can be assisted to earn additional income.

(h) Fish culture in irrigation tanks

The progress accomplished under this category was not available, but it was reported that tanks are being encouraged to stock with quality fish seed. The project is largely focussed on producing table size fish for consumption and the quantity estimated to be produced is over 22,000 tons. Hence, carefully monitoring of the tanks to gather information on production accomplished should be made as an important component. Due to difficulty in obtaining actual production estimates, indirect approach of estimating increase in fish production has been suggested wherein number of large fingerlings stocked would be used as a basis to estimate likely production accomplished. Few of the tanks visited clearly demonstrate the high potential and productivity obtained. However, these are yet to be captured for use in the project. As the lease amount fixation would largely depend on production obtained for the subsequent year, under reporting of the production is a common phenomenon. However, by ascertaining the size of the seed stocked, water retention time in the area; it is possible to estimate the nearly correct production figures. Field monitors appointed may be used to closely monitor the growth and production trend in the tanks. Further, close monitoring of seed sale from the seed banks to these tanks should be monitored. With the increase in number of tanks and the difficulty in monitoring all the tanks, seed sale information could be used for estimating production.

(i) Fish kiosk

This is one another successful activity under the project. Most of the Kiosks are functioning, but the sale of fish has been largely dependent on the location of the kiosks. The level of profit reported still appears as small, but as the kiosks are being continued beyond the support phase reflect that these have been making income adequate enough to sustain the activity.

Fly menace is a major issue in some Kiosks . Improvements have been made to avoid the menace by having closed glass chambers. Hygiene is an issue that need to be addressed through education. Fly trapping devises may be encouraged for placing inside the kiosks.

Education to customers is an idea that has been suggested since the first mission. Only in Vellore, a poster has been placed on the health benefits of fish. As part of the Information dissemination, it is suggested that proper flex board may be developed and provided to all the kiosks.

(j) Provision of fishing implements for better harvest

This activity has been completed in all the phases and fishers have been able to get fishing net material, coracles. Fishers continue to use them in many places and derive the benefits. Capturing the benefits and impact on livelihood by the use of these implements would be beneficial.

(k) IEC :

Farmers continue to be trained under the project. However, gender based segregation of data is not available. Further, the impact of the trainings imparted has to be captured and presented. In almost every project area, exposure visit was made as a component; information on such exposure visits may be included.

Most importantly, this component should capture the successful activities, develop case studies on such successes and disseminate them widely. Further, use of mobile communication technology may be used for dissemination of information and providing support service to farmers.

Conclusion:

Project should focus on building data base on each of the intervention and ensure that such data base is available. Mobile phone connectivity may be harnessed to provide continued support to farmers with least cost. Most importantly project activities should now focus on increasing large size fish seed availability substantially. Hence, available resources in the project be diverted to ensure the production of adequate amount of size fingerlings, in excess of six crore. Current activity level involving cement seed banks , seed nursing in cages , earthen seed banks provide only less over one crore seed that too when they are used to full extent. Hence, activities have to be tapered on increasing quality seed availability for stocking in tanks and ponds. Additional DPR may be modified suitably by taking the suggestions in to consideration to accomplish the seed production targets.

Annex 4 -- Environmental Safeguards

The mission reviewed the status of implementation of environmental safeguards, undertook field visits to Coimbatore Division and observed the project activities with respect to potential adverse as well as positive environmental impacts and interacted with a large number of stakeholders[6].

1. ***Working of the Environmental Cell (EC) in MDPU:*** The mission is pleased to note that the EC continues to work in a reasonable manner with improvement in reporting and documentation. The mission suggests that going forward the EC would share the draft final version of reports prior to printing them as final output. This will provide an opportunity to help improve the quality of the reports. The EC should coordinate with the National Soil Survey Bureau in Bangalore to obtain basin-wide soil maps for Tamil Nadu for inclusion in the Atlas, rather than conducting afresh soil testing. The EC is preparing the Sub-basin Environment Atlas and would share a draft outline of it giving the report structure and nature/scope of content by November 30, 2011.

2. ***External audit of ESMF implementation:*** The mission learnt that 33 firms have submitted Expression of Interest for undertaking the external audit of the ESMF implementation. The mission emphasizes the timely completion of this process, as this consultancy has been delayed considerably.

3. ***Awareness campaigns:*** The EC has been conducting a number of awareness campaigns in schools, WUAs and farmer groups. Yet, feedback from the field and other line department officers indicate that government staff, including engineers engaged in the project have not been covered for sensitizing them to environmental concerns and significance of managing the environmental impacts. The mission recommends that the EC should conduct environmental awareness programs for the MDPU engineers and staff of other line departments both in Chennai and in field locations. Further, the EC should start thinking about some indicators to measure the success of undertaking these awareness programs. Whether these awareness programs are resulting in behavioral change in project beneficiaries or other stakeholders should be assessed and documented.

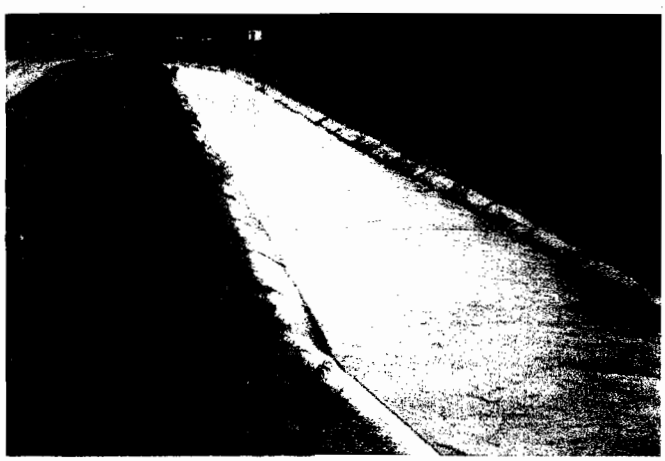
4. ***Measuring the positive environmental and social impacts:*** While undertaking sub-basin level environmental and social assessments, the EC should ensure to include measureable estimates of the positive environmental and social gains achieved under the project. For example, estimate the adoption of SRI in a sub-basin and compare it with pre-project baseline. This should include SRI adopted by farmers without project support as well but differentiated to ascertain the true impact and reach of the project investments. Similarly,

[6] Stakeholders included WUA members, Environmental Cell Division representatives, NGOs, line department officials, WRO officials, TNAU staff and other farmer beneficiaries

replacement of chemical fertilizers and pesticides by adopting organic farming approaches should be documented.

5. ***Promoting organic farming:*** It was observed that there is an increasing demand for organic farming spurred by the demand for organically grown foods in select urban markets. While, the mission visited two big farmers practicing organic farming, it was felt that the small and marginal farmers are fearful of experimenting with organic farming, lest they lose their yearly production to a failed experiment and burden themselves with external debt. Nonetheless, INSPIRE, an NGO claimed that organic farming would be profitable over conventional agro-chemical based farming and farmers could be motivated to undertake organic farming. The mission suggests that the EC should explore this in detail before deciding to pilot organic farming model with small and marginal farmers.

6. ***Pilot for enhancing herbal plantation and canal bank management:*** There is an increasing demand for herbal products and a number of farmers are growing medicinal/herbal plants to meet that demand. In this regard, good scope exists for planting the medicinal/herbal plants on the barren slopes along the canal banks by involving the WUAs. The income so generated could be used by the WUAs for maintaining the irrigation canal network. Care should be taken to use those species that are non-palatable for cattle and other livestock. The mission recommends that a brief concept note for this pilot should be prepared and submitted to the Bank after due consultations with the relevant WUA by November 30, 2011.



Main irrigation canal showing slopes where medicinal/herbal plants could be cultivated through WUA
Location: Coimbatore District

List of persons met during the mission 13-09-2011 at Chennai, MDPU office

1. Er. S. Karunakaran, CE,PF, WRD, PWD, Chennai
2. Er. Rajeswari SE, WRD, Env Cell Circle, Trichy
3. Er. K.S. Thulasiram, DCE, PF, WRD, PWD, Chennai
4. Er. Prakathiswaran, AEE,PF Wing, WRD, PWD, Chennai
5. Mrs. Mohanavalli, AE, O/O CE PF Chennai
6. Er. R. Ilangovan, EE, EC Division, PWD, WRD, Coimbatore
7. Er. M.G.Rekha, AE, ECD,PWD, WRD, Coimbatore
8. Er. C. Senthilkumaran, AE, ECD, PWD, WRD, Coimbatore
9. Er. AYYUPKHAN, EE, ECD, WRD, Madurai
10. Er. Chandramohan AE, ECD, WRD, Madurai
11. Er. Maniyarasu, AE, ECD, WRD, Chennai
12. Er. Sakkaji AE, ECD, WRD, Chennai
13. Er. Mugilan AE, ECD, WRD, Chennai
14. Er. Padmapriya, AE, ECD, WRD, Chennai
15. Er. Selvakumari,AE, ECD, WRD, Chennai
16. Er. Maheswari, AE, ECD, WRD, Chennai

14-09-2011 and 15-09-2011 at PAP System Pollachi, Aliyar dam and Palladam Organic Farm

1. Er. Ranganathan. S.E., PWD, WRD, PAP Circle, Pollachi
2. Er. Selvaraj, EE, PWD, WRD. Pollachi Division, Pollachi
3. Er. Damodharan, AEE,WRD, PWD,Vettaikaranpudur sub division
4. Er. Ponnusamy,AE,PWD,WRD,Pollachi division
5. Er. Sakthikumar,AE,PWD,WRD,Pollachi division
6. Er. Anandha Baladhandapani AE,PWD,WRD, Pollachi Division
7. Er. Murugesan AE, WRD, PWD, Pollachi
8. Mr. Chinnappan, T.C. Member, WUA Naiken palayam, Pollachi Taluk
9. Mrs. Revathy, Director, Inspire, Pollachi
10. Mr. Arthysamy, Directoe, Inspire, Pollachi
11. Mr. Gopalakrishnan, Evergreen Environmental Conservation Group, Udumalai, Tiruppur taluk
12. Mr. Salim, Environmental Conservation Group, Coimbatore
13. Er. Kalidasan, OSAI, Environmental NGO, Coimbatore
14. Dr. Gunasekaran, Coimbatore wetland conservation Group,Consultant, Coimbatore
15. Mr. Surat, Environmentalist Coimbatore
16. Mr. S.M.Priyhiviraj, CARE-T Coimbatore

17. Mr. Mothyraj, CARE-T Coimbatore
18. Mr. K.V. Palanisamy, Organic Farmer Kethanur, Palladam Taluk, Tiruppur District
19. Mr. Selvaraj, Organic Farmer, Farmer Kethanur, Palladam Taluk, Tiruppur District
20. Er. Krrishnamurthy, organic Farmer Kethanur, Palladam Taluk, Tiruppur District

ANNEX 5

Additional Observations from Field Visits in Chennai Region

In TN- IAMWARM project in phase III in Chennai region, the work of rehabilitation of irrigation system is progress in five sub basins namely Araniar, Kambainallur, Kovilar, Pambnar Varattar and Thurinjalar. The project in this region covers the command area of 32,257 hactares. The work is taken up in 22 packages and covers 257 tanks, 110 anicuts and 540.775 kilometers of supply channel. Out of these 367 works in progress, the W.B.Mission from 13th of Sept. to 16th Sept., visited 15 works of phase III, - five in Tiruvallure, four in Dharmapuri, six in Tiruvannamalai district. The officers of, TN PWD and third party quality supervision consultants M/s WAPCOS, accompanied the Mission. The projects are at different stages of construction. The main observations for individual projects have been communicated to WRO separately. Summary of the findings during this visit is:

a. In almost all the schemes visited the quality of concrete and masonry work was good and acceptable, the compaction of earth work at dam top is satisfactory, however the earth work on slopes has a scope for improvement. The compaction could be done more effectively, mechanically either by impactors or by replacing the back- ho bucket of excavator by thick steel plate and pressing the slopes with the plate. This will facilitate to work on slopes where large number of trees is grown. The final slope may be then trimmed to designed profile. The turfing to protect the downstream slopes could be taken up as soon as the final trimmed compacted slope is available. This may be done just before the onset of monsoon, to avoid the rain cuts on the slopes.
b. Out of 13 packages visited, only in 3 packages, the contractors have delivered the progress of work as per tender schedule, in rest of the packages the progress is lagging behind. The construction program for completing the balance works in balance contract period should be obtained from the contractors. This program could be tank wise, month wise and item wise, and may be used for monitoring the progress of the contract. This program after approval by E.E., could be shared by engineers executing work, the quality control formation and the Third Party Construction Quality Management and Technical Supervision (CQMTS) consultancy for planning their site visits.
c. The third party CQMTS consultancy, so far with their limited staff, made only one visit to 12 projects out of 15 projects visited by supervision mission. Their observations are of general nature whereas observations are expected to be very specific. It is expected that the experts of CQMTS consultancy visiting site, as far as possible make the efforts to get the defect noticed by them, rectified at site, by discussing the point with the executive people and the contractors. The CQMTS consultants should establish a (Website, e-mail SMS or any other information) system immediately to communicate their observations on the same day, to the controlling E.E., S.E. and C.E in charge of works, for timely and effective corrective measures. The OK Card system is being followed but general remarks in form of "yes" or " no" are being entered in OK cards. The CQMTS

consultancy should train the persons at work site to enter the appropriate remarks against the activities mentioned in the OK card.

d. One set of approved construction drawings of works and schedule of quantities should be available at site, so that in charge and other visiting engineers can ensure that the work is progressing according to approved drawings. For assuring the proper levels and layouts some temporary reference pillars (T. B.M) could be constructed. This will help in executing work more accurately and conveniently.
e. At places the irrigation canals are being de silted by machines and excavated section is much more oversize than what is required. Exact design size could be got examined through the CQMTS consultant and right sizing of the section could be done. The side slopes of the channels de silted /excavated are very steep and excavated soil is dumped just on the edge of the excavated channel, obviously if the dumped soil is not shifted away from the edge of channel, during the first rain the excavated soil will slip in to the excavated channel.
f. In two packages of Thiruvallur district, substantial liabilities are pending for the want of LOC and clearance of pending liabilities will accelerate the progress.