

**Andhra Pradesh Integrated Irrigation and Agriculture Transformation Project (APIIATP)
Identification Mission: November 15-25, 2016**

Aide Memoire

Introduction

1. A World Bank Identification Mission¹ was undertaken from November 15-25, 2016 to assess progress towards the proposed Andhra Pradesh Integrated Irrigation and Agriculture Transformation Project (AP-IIATP). Detailed discussions were held with project authorities in Hyderabad, and field visits were made to two different locations in the Krishna district. The mission had discussions with Principal Secretary - Agriculture (Mr. B Rajasekhar), Commissioner-cum-Secretary - Horticulture (Mr. Chiranjiv Choudhary), and a wrap-up meeting with the Chief Secretary (Mr. S P Tucker, IAS). Subsequently, the mission had a debriefing meeting with Mr. Rishikesh Singh, Director, Department of Economic Affairs in Delhi. The mission is grateful to all concerned for their cooperation and constructive discussions.

Mission Objectives

2. The Pre-Identification Mission to AP-IIATP had reported the readiness of the Government of Andhra Pradesh (GoAP) for undertaking the project with the appointment of the Project Director and a well-designed staffing structure for a functional Project Management Unit (PMU). The mission had discussed and finalized the Project Concept Note (PCN) with PMU, and agreed on project components (four pillars), development objectives, few broad activities, tank command area, agriculture interventions, fishery development, potential agribusiness opportunities, and a broad institutional arrangement.

3. The objectives of the present identification mission were to:

- Finalize fund flow mechanism,
- Finalize timeline for all manuals' completion,
- Finalize the design of first 150 small-scale community-based irrigation systems, and quality control mechanism,
- Identify dominant agriculture commodities' supply chain,
- Define and develop measurable climate co-benefits,
- Finalize Finance, Procurement, Environmental-Social and Project Implementation Plan (PIP).

This aide memoire summarizes the mission's main findings and agreements reached.

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Main Findings

4. The primary focus of the mission was to hold discussions with the PMU on prioritizing project activities and detailing budget for respective pillars. For operational ease in project implementation and subsequent monitoring, the duration of the project has been split into three phases of two years each. The budget break-up for sub-components and activities is under the process of finalization.

5. The GoAP has issued official order (G.O. Ms. No. 114 dated 30/11/2016) confirming the setting up of a Project Steering Committee under the chairmanship of the Chief Secretary for providing overall guidance to the PMU for project implementation. A budget of Rs 4 Crore has been earmarked for taking up activities during the current year viz., preparation of Detailed Project Reports (DPRs), hiring of consultants and other contingent expenditure related to the project preparation activities.

6. The Terms of Reference (ToR) for developing the DPR for 305 small-scale community-based irrigation systems to be taken up in the first phase, out of the proposed 146 cascades covering 500 small-scale community-based irrigation systems to be rehabilitated in the first phase, has been finalized; and the PMU has suggested using AP e-procurement for outsourcing the preparation of DPR and bidding documents, which is to be completed by Mar 31, 2017.

7. As per the agreed staff matrix for a fully operational Project Management Unit (PMU), the PMU has initiated the process for filling those positions and selected candidates will join the project during Dec 2016. The PMU confirmed that it has received Request for Proposals (RFP) for hiring a consulting firm to prepare the PIP. The draft ToR for hiring an External Monitoring Agency to generate time series data on monitoring the impact of project activities has also been developed.

8. The PMU and the Bank team reviewed the timeline for the project preparation and found that the project package (all manuals including Social and Environmental Management Framework – SEMF and PIP) will be ready for World Bank Board approval by March 31, 2017.

The component-wise progress and timeline for future actions is detailed below.

Pillar A: Improving Irrigated Agriculture Efficiency at Farm level

9. This component would improve smallholder tank-based minor irrigation to strengthen the integrated farming system (in which growing crops, agro-forestry and rearing livestock co-exist) with reduced water footprints. It will consist of four inter-related sub-components: (i) institutional strengthening and capacity building (ii) improving smallholder irrigation system performance and resilience; (iii) improving water productivity and efficiency; and, (iv) building synergy with the Primary Sector Mission (on agriculture, fishery, horticulture, livestock and irrigation).

A1: Institutional Strengthening and Capacity Building of Water Users' Associations (WUAs)

10. This sub-pillar would focus on engaging communities through WUAs for socio-engineering the concept of reducing water footprints in farm system development without

compromising on productivity and profitability. The mission has impressed upon the project to accord special importance on the institutional analysis in view of the various debates and discussions as well as High Court rulings on the amendments made to the Act related to WUAs. The assessment should try to understand how inclusive (representative, responsive and responsible) are the existing institutions especially the WUAs and other institutions like Commodity Interest Groups (CIGs), Fishermen Cooperative Societies (FCS) etc. Learning from these institutional arrangements during the previous phase need to be documented. In addition to lessons learnt from the previous phase, it was also agreed that a quick assessment would be undertaken to understand the need for any specific institutional structure in the case of cascading small-scale community-based irrigation systems. A draft ToR for the same was prepared and is attached (Annex 3).

A2. Improving Smallholder Irrigation System Performance and Resilience

11. **Preparation of DPRs and Bid Documents.** The sub-component A2 will modernize irrigation infrastructure including small-scale community-based irrigation systems and irrigation canals in the cascade system. A total of 1,492 tank systems including the irrigation canals off-taking from the sluices of these small-scale community-based irrigation systems are proposed to be rehabilitated and modernized. The 364 cascade systems account for 1,280 small-scale community-based irrigation systems and the balance 212 are independent small-scale community-based irrigation systems. The Water Resources Department (WRD) has proposed to rehabilitate 146 cascade systems comprising about 500 small-scale community-based irrigation systems in the first phase. Presently, the in-house capability is extremely deficient for timely preparation and completion of the DPRs and Bid Documents of these small-scale community-based irrigation systems. Implementation readiness of the project requires that Bids for contracts worth at least 30 % of the project cost (or the first phase) are received and award finalized prior to negotiations. Finalization of rehabilitation measures for the tank systems and associated works to be included, designed and costed in the DPRs involve extensive surveys of tank bunds, irrigation sluices, surplus weirs, structures, feeder channels and irrigation channels. Given the magnitude of the task and limited in-house capability to undertake it, it has been proposed by WRD to outsource the preparation of DPRs and Bid documents to a competent agency through open competitive bidding based on the World Bank 'Quality Cost Based Selection Method'. Discussions with Chief Engineer, Minor Irrigation and his team as well as discussions with the Project Director and PMU staff lead to developing a schedule.

12. As per the schedule and DEA's readiness criteria, about 30% of the 'first phase' rehabilitation works will attain implementation readiness by May 31, 2017. The mission provided broad guidance to WRD and PMU on the preparation of ToR in respect of all the relevant technical aspects relating to the rehabilitation of tank systems and the On-Farm Development works during the first phase.

13. **Dam Safety Plan.** As per the World Bank OP. 4.37, an independent Dam Safety Review Panel (DSRP) is required to be constituted by GoAP to inspect the large dams to assess their present condition and recommend the needed safety measures wherever required. The cost of execution of the dam safety remedial measures, recommended by DSRP, is to be included in the respective DPRs. The International Commission on Large Dams (ICOLD) classifies a large dam as one with a maximum height of more than 15 meters. A dam having between 10 meters and 15

meters height is also included in the classification of a large dam provided its length is not less than 500 meters or capacity is not less than 1 million cubic meters or the maximum flood discharge is not less than 2,000 cubic meters per second. Chief Engineer, Minor Irrigation should prepare the list of the large tank bunds as per the ICOLD classification and furnish it to PMU. It is agreed by the Project Director that the Dam Safety Review Panel will be constituted by December 31, 2016.

A3: Improving Water Productivity and Efficiency

14. This component would improve smallholder tank-based minor irrigation to strengthen the integrated farming system with reduced water footprints.

15. **Tank selection and approach.** From among 40,817 small-scale community-based irrigation systems in Andhra Pradesh, the project identified 1,492 small-scale community-based irrigation systems as candidate small-scale community-based irrigation systems that need rehabilitation. After further scrutiny based on the selection criteria,² including a hydrological assessment, 1,211 small-scale community-based irrigation systems will be selected for modernization (sub-component A2). As in the previous project, tank improvement under the project is not limited to the improvement of physical infrastructure but involves water management and participatory monitoring to improve the efficiency of the system as well. The participatory irrigation management (PIM) will follow a distinct approach where better operation and maintenance (O&M) of rehabilitated smallholder tank systems will be dovetailed with irrigation outreach based on reduced water footprints through adaptive agriculture practices (Component B) at the farm level. After developing a DPR, a Tank Improvement and Management Plan (TIMP) will be developed adopting a rigorous participatory process.

16. **Cascade system approach.** As one of the innovative approaches, the project will adopt cascade system development to improve water efficiency. The mission visited two small-scale community-based irrigation systems in Krishna district. Of these, the Chlkurivarigudum tank is the last of the three small-scale community-based irrigation systems in the downstream of a cascade. Current gap area in this tank is 67 acres out of 225 acres of registered command area (ayacut³). The available water is influenced by the flow from upstream small-scale community-

²Nine criteria are (1) Hydrological Viability and feasibility of cascade to be studied, (2) Gap ayacut for the small-scale community-based irrigation systems should be more than 25%, (3) Exclude small-scale community-based irrigation systems in which land acquisition is involved, (4) Revision of Hydraulic standards will not be allowed in the revival/ restoration of the small-scale community-based irrigation systems in implementing the project during the Estimates or execution, (5)The small-scale community-based irrigation systems having more than 40 Ha of ayacut will be considered as isolated, (6)Small-scale community-based irrigation systems having less than 40 Ha ayacut will also be considered if it is part of a cascade.

Small-scale community-based irrigation systems to be considered as per need based duly considering the repairs and condition the tank, (7) Priority may be given to small-scale community-based irrigation systems where ground water levels are very low in and around the small-scale community-based irrigation systems, and (9)Buttressing of small-scale community-based irrigation systems taken up in previous projects may be considered if required under this project.

³ Ayacut is the area served by an irrigation project such as a canal, dam or a tank, and gap-ayacut refers to the gap in the actual irrigation potential of the irrigation system.

based irrigation systems. Currently no institutional arrangement among 3 cascade tank communities exists. In the cascade system, the seepage from a tank and excess water can be reused in the downstream. Water distribution needs to be considered in its entirety, which will enable more efficient and equitable water use than an individual tank-based approach. This approach will be supported by institutional strengthening and capacity building (sub-component A1) and by in-flow hydrology management (sub-component A3). Then, all these comprehensive engagements will be captured as an indicator of 'Water Productivity'.

17. **Water Productivity.** As the national program *Pradhan Mantri Krishi Sinchayee Yojana* (PMKSY) advocates 'Per drop-More crop', water productivity is a key indicator to measure the success of the project. For this innovative engagement, one of the following approaches is necessary:

- i) Capture the volume of the water supplied at the tank sluice gate either by the discharge amount at the cut-throat flume or by the decreased amount of tank water (checking scales near the sluice gate), using H-V curve (if this graph doesn't exist, topo survey for a contour map is necessary). Indicator will be 'increased crop production per unit of water supplied at the tank sluice gate (kg/m³)'.
- ii) Capture the water delivered to plots by setting sensors at several places. Indicator will be 'increased crop production per unit of water delivered (kg/m³)'.

18. It is important for PMU to select one or two methods on the situation of proposed tank systems as well as discussions with field officers.

Pillar B: Promoting Adaptive Sustainable Agriculture Practices

19. This is an important pillar, aimed at improving production and productivity of the small holder irrigation system to increase returns to farmers and other water users through adoption of climate smart diversified agriculture production systems. The overall objective is to promote integrated farming systems for improving farmers' income through adoption of climate-resilient agriculture technologies and practices.

B1: Climate Smart Diversified Agriculture Production Systems

20. The project has selected 1,211 small-scale community-based irrigation systems with a designed *ayacut* of 0.360 million acres in 11 districts for promoting sustainable agriculture practices out of about 40,817 small-scale community-based irrigation systems under the Minor Irrigation Department, serving an *ayacut* of 2.560 million acres in the state. However, it is proposed to include non-*ayacut* area within a given 'gram panchayat' for awareness generation and extension services.

21. The mission held detailed discussions (see Annex 4) with the Departments of Agriculture and Horticulture about the scope, design and implementation of various activities under this component. Draft Project Implementation Plan (PIP) describing rationale for each sub-component, details of various activities (what will be done, where, when, by whom, how, etc.), needed investments, phasing of activities in project years 1-6, detailed cost tables, justification of costs, performance indicators and outputs, coordination and monitoring of activities will be prepared by Dec 15, 2016 by the implementing agencies and submitted to PMU. The PIP will

also include: (i) crop-wise and year-wise targets of organizing demonstrations, trainings, exposure visits, workshops, and other project activities.; and (ii) end project targets for gains in productivity, cropping intensity and diversification (area under different crops, vegetables and fruits) and area to be covered by improved crop and water management and climate resilient practices. After review and compilation by PMU, the PIP will be sent to the Bank for review.

B2: Innovation and Technology Transfer for Fishery Production

24. The high degree of economic opportunities and benefits offered by the currently available and underutilized aquatic resources (minor irrigation small-scale community-based irrigation systems) consists of 25,000 hectares of effective water spread area (EWSA) in 1,211 small-scale community-based irrigation systems. The project will address fisheries developmental constraints including physical factors such as harvest from seasonal water bodies for lack of suitable quality fish seed and feed; lack of technology accessibility; paucity in the regulatory policies to ensure quality of inputs for production and consumption; and inadequate institutional capacity (Annex 4). Key investments areas selected to transform the inland fisheries sector are as under:

a) Policy reform to ensure input and product quality: Aquaculture development activities will be aimed at providing a regulatory structure, and certification to ensure quality inputs such as fish seed and feed, and the fishery products marketed to satisfy quality requirements cited in HACCP (Hazard Analysis & Critical Control Point), for export or domestic consumption.

(b) Innovative climate resilient fish production models: The project will aim at developing appropriate production models considering short period of water availability in accordance with the micro-climatic conditions in the project area for maximizing productivity, and for addressing combating climate change concerns. Appropriate production models will be designed by introducing fast growing fish species, such as *Amur Carp*, Genetically Improved Tilapia (GIFT), *Jayanthi Rohu* and *Pangasius* for seasonal MI small-scale community-based irrigation systems. Pure line breeding program will be implemented to ensure supply of improved seed quality.

(c) Improved post-harvest technology and value chain participation: Key activities selected for investments are: promotion of value added and ready-to-cook products; improved fish transport in hygienic conditions for wider markets in retail and wholesale vending; and establishment of fish kiosks at suitable locations.

25. The total budget proposed for implementing the fisheries component is Rs.150 Crore, which will directly benefit 40,000 landless fishers and marginal smallholder farmers, and generate additional employment for about 27,000 persons. Successful implementation of the fisheries sub component is expected to generate a return of Rs. 413 Crore/year by project end.

Pillar C: Climate-friendly Market and Agribusiness Promotion

26. Given the size and nature of landholdings, the project is focusing on expanding farm incomes through forward market linkages. The GoAP has launched the Primary Sector Mission to revive the agriculture sector by enhancing value addition of farm produce (pulses, oilseeds and high value grains, horticulture, and fisheries) by developing transit storage facilities. GoAP is clear about the kind of support they need for transitory storage system. Based on the agri-

business framework an external agency will be sourced to conduct a detailed mapping exercise to determine typology of commodity clusters, and develop marketing strategies.

27. The project will establish an Agri-Business Promotion Facility (ABPF) to foster and accelerate the growth of agribusiness, thereby helping to commercialize agricultural production, increase value addition and agricultural incomes. The ABPF will identify growth oriented entrepreneurs, who are pursuing business opportunities based on post harvest value addition in agriculture and allied sectors, and provide these entrepreneurs with a holistic service offering that accelerates their growth and increases their sustainability. It is expected that ABPF will have a catalytic effect, encouraging a new generation of entrepreneurs to enter, grow, and advance the agriculture sector in the state.

Pillar D: Project Management and Capacity Building

28. The objective of this component is to ensure smooth implementation of project activities, as well as monitoring of, and learning from project processes and outputs.

29. The new project has lot of experience from earlier project to fall back upon. However, the previous mission had recommended strengthening the M&E system by building a team of experts. The project has issued EoI for hiring six experts (GIS, MIS, Fisheries, Agribusiness, Social & Institutional, and Capacity Building & Communication), and the process of appointing the team will be completed by mid-Dec 2016. With the infusing of additional human resources, this unit is projected to serve as a ‘knowledge hub’ for the project, developing exclusive monitoring system. Designed to facilitate results-based management, learning and process monitoring, and impact evaluation, this unit will hold overall responsibility for planning and coordinating internal and external monitoring.

30. The mission helped the PMU with a ToR for outsourcing an agency for conducting the Baseline Survey. The process of hiring the agency is likely to be completed by Dec 31, 2016. It has further been noted that the PMU has initiated the process for procuring the services of a Third Party Monitoring Agency too. It has been agreed that the PMU will be ready with a robust monitoring framework for field-level data sourcing, its validation and forward flow using effective communication tools before the next mission.

Economic and Financial Analysis

31. Economic and financial analysis will be undertaken through estimating expected incremental benefits generated from the project investments in improving irrigated agriculture efficiency at farm level, promoting adaptive sustainable agriculture practices, post-harvest market and agribusiness promotion, and project management and capacity development.

32. Economic and financial impacts will be based on the expected estimation of: (i) expansion of area irrigated benefiting from the modernization of small-scale community-based irrigation systems and contribution to the increased crop production and intensity; (ii) crop diversification from rice to low water requiring and high-value added crops in both irrigated and rainfed areas in the project tank villages and cascades; (iii) improved fish productivity and profitability through production, processing, and marketing; (iv) net income benefits of the FPOs through improved post-harvest management and integration into commercial agricultural

commodity value chains; and, (v) improved water security reducing the risk of low production during the erratic weather conditions.

33. The economic and financial analysis will be based on sample data covering 100 tank areas and 1,500 households. The sample data will be collected from diverse agro-climatic zones, tank sizes, different income groups, and commodity-specific farm activities; therefore, the analysis will be able to capture diverse socio-economic environments in the project area.

34. The economic and financial analysis will be carried out for a 25 years period including 6 years of project implementation period. The analysis will be based on 2016 -2017 constant prices for each commodity. A discount rate of 12% will be assumed. The official exchange rate of INR 67.2 to US\$ 1 will be applied to convert to US dollars. The Operation and Maintenance (O&M) costs of small-scale community-based irrigation systems and other irrigation structures will amount to 3% of the cumulative investment costs.

Social and Environmental Safeguards

35. The mission reviewed the progress made on preparatory efforts towards addressing social and environmental aspects. As stands today, the project has invited EoI for the conduct of a baseline study. PMU was of the view that this can cover E&S aspects as well. This may cover some E&S aspects, but not comprehensive enough to fulfill the necessary requirements. Hence, the mission has advised that a separate independent enquiry be initiated for the preparation of a ESMF and other independent standalone reports in accordance with the Bank's safeguard policies. The deliberations also transpired that: while the ESMF prepared for the previous project serves as an excellent starting point, supplementary and complementary efforts are essential towards: (i) revising and updating ESMF to reflect comprehensively aspects related to tribal and lands; (ii) resettlement policy framework (RPF); (iii) Tribal People Planning Framework (TPPF); (iv) Gender Impact Assessment; (v) IPM/IPNM as a part of the Pest Management; and (vi) Institutional Analysis.

Finance

36. The mission objective was to ensure smooth closure of the loans under the current project (P100789), which will offer pace to the follow-on project under preparation, also to continue assessment of the financial management arrangements of the new project.

37. The mission reviewed the audit reports for FY 15-16. The project team has demonstrated a remarkable effort in working with AG office to recertify most of the previous year disallowances. All pending claims, ineligible expenditures, IUFRs of the closing project were reviewed and approved. As on date, all the ineligible expenditures were adjusted and the loan accounts are ready for closure.

38. The finance management assessment for the project under preparation is under documentation. FM manual is being drafted and is expected to be completed by Jan 31, 2017. The mission assumes that most of the financial management arrangements are unchanged and the same will be applicable to the proposed project, with few changes based on project requirements. Considering that substantial amount of money would be flowing through several Line Departments, it was agreed to reorganize the fund flow arrangement for seamless flow of funds

to the beneficiaries, and to ensure for an executive committee with members from all the participating line departments, for a proper coordination during implementation. The financial management arrangements would be reviewed again and updated based on further developments in project components and implementation arrangements.

Procurement

39. The PMU was instructed on how to prepare the Procurement Manual and Procurement plan based on the requirements of the WORLD BANK-Procurement Regulations for IPF Borrowers (July 2016) for procurement of Goods, Works, Non-Consulting and Consulting Services. The procurement plan for the first phase will involve contracts with an estimated cost of INR 350 crores. The procurement process for preparing the DPR for these contracts has been initiated and the DPRs and draft bidding document for the first phase will be ready by March 2017. The PMU was also appraised of the various procurement related activities that need to be completed by (a) the Appraisal Stage and (b) the Negotiations Stage, through a Power Point Presentation, which explained the entire road map of activities to be completed, including templates for Procurement Plans, thresholds of Procurement Methods, prior review thresholds and the scope of the Project Procurement Strategy for Development (PPSD). For preparing PPSD, the project has the option of either hiring an independent consultant or a consulting firm through the CQS/QCBS method. A ToR for engaging a consultant for preparing the PPSD was shared with the project. The first draft PPSD is expected by the end of January 2017.

Next Mission Schedule

40. The next mission is tentatively scheduled during February 2017.

List of Annexures

- (i) Annex 1: Agreed Actions
- (ii) Annex 2. Status of Previous Agreed Actions
- (iii) Annex 3: ToR for Environmental and Social Management Framework
- (iv) Annex 4: Promoting Adaptive Sustainable Agriculture Production Systems
- (v) Annex 5: Innovation and Technology Transfer for Fishery Production
- (vi) Annex 6: Climate-friendly Market and Agribusiness Promotion \
- (vii) Annex 7: Economic and Financial Analysis

Annex 1: Agreed Actions

S No.	Agreed Actions	Responsible	Deadline
Pillar 1: Improving Irrigated Agriculture Efficiency at Farm Level			
1.	i) Completion of ToR by WRD/PMU	PMU	Nov 30, 2016
	ii) Approval of ToR by WB	WB	Dec 04, 2016
	iii) Award of Contract to outsourced Agency for preparation of DPRs and Bid Documents of 146 cascades (about 500 small-scale community-based irrigation systems) based on 'Quality Cost Selection Method'.	PMU	Mar 06, 2017
	iv) Constitute Dam Safety Review Panel	PMU	Mar 31, 2017
Pillar 2: Promoting Adaptive Sustainable Agriculture Practices			
2.	Designate a senior officer in DoA, DoH and Agriculture Marketing as a Nodal Officer for coordinating component preparation. supported by technical experts from the departments	DoAg, DoH, DoAM, SPD CAD	Nov 30, 2016
3.	i) Deployment of required fishery expert for the project preparation and implementation design	PMU	Nov 30, 2016
	ii) Complete survey of MI small-scale community-based irrigation systems	PMU	Dec 31, 2016
	iii) Preparation of first draft DPR	PMU	Jan 31, 2017
	iv) Consultative meeting on first draft of DPR with the various stakeholders	PMU	Feb 08, 2017
	v) Presentation of the final draft of DPR to the Special Commissioner	PMU	Feb 28, 2017
Pillar 4: Project Management & Capacity Building			

4.	i) Government Order on Implementation and Fund Flow Arrangements	PMU	Nov 30, 2016
	ii) Award of Contract for PIP Preparation (Technical Bids: Dec 6; Financial Bids: Dec 13)	PMU	Dec 15, 2016
	iii) Baseline Survey (EoI issued)	PMU	Dec 31, 2016
	iv) Hiring Individual Experts for PMU (Experts on M&E, MIS, GIS, Fisheries, Agribusiness, Social & Institutional, and Capacity Building-Communication Expert)	PMU	Dec 15, 2016
	vi) Draft Project Implementation Plan (PIP)	PMU	Dec 31, 2016

Annex 2: Status of Previous Agreed Actions

S No.	Agreed Actions		Responsible	Deadline	Status
1.	Issuance of a Government Order/Gazette Notification for the new project		PMU	Sep 15, 2016	Under process at the Finance Department.
2.	TORs for all the staff mentioned in Organogram		PMU	Aug 31, 2016	ToR Finalised,
3.	All project staff in place		PMU	Sep 30, 2016	Under process
	All manuals (including finance, procurement, PIP, technical manuals and SEMF) shall be prepared, reviewed and ready for appraisal		PMU	Nov 15, 2016	Draft Manuals Prepared
1.	Project Implementation Plan		State Project Director	Oct 31, 2016	RFP issued to 6 agencies by Dec 6, 2016
2.	Hydrological Viability Assessment Study		APSAC	Oct 31, 2016	APSAC Engaged
3	Baseline survey	(i) TOR	State Project Director	(i) Aug 31, 2016	ToR Finalized
		(ii) Commencement of survey		(ii) Sep 30, 2016	Notification Issued
4.	Detail Design for Phase 1/Year 1 (100 small-scale community-based irrigation systems)	(i) Completion of Tender documents	District Project Director	(i) Oct 31, 2016	Rate Structure for DPR in process
		(ii) Completion of DPR (TIMP and bidding documents)		(ii) Dec 30, 2016	Tenders to be called after rate approval
5	Deployment of required experts for project preparation and detailed design of the implementation.		AP DoF	Aug 31, 2016	
6	Complete survey of small-scale community-based irrigation systems and provide tank profiles for designing the implementation and estimating budget requirements		AP DoF	Sep 30, 2016	Under process
7	Preparation of detailed Organogram for		AP DoF	Sep 30, 2016	

	Project Implementation			
8	Preparation of DPRs first draft	AP DoF	Oct 31, 2016	Under process
9	Necessary project manuals, operational strategies and institutional arrangements shall be ready for developing implementation plans for Component B.	AP DoAg	Sep 16, 2016	Under process
10	World Bank Task Team to engage Agriculture Department officials in a meeting to develop implementation plans for Component B.	AP DoAg	Sep 16, 2016	Agri. Department engaging staff
11	Baseline assessment and completion of Social and Environment Management Framework (SEMF)	PMU	Sep 30, 2016	ToR Finalized
12	Project Financial Management Manual (FMM) to be completed	PMU	Oct 31, 2016	Draft finalized
13	Cost sharing between the departments and the financing percentage to be finalized	PMU	Oct 31, 2016	Under discussion
14	Draft Procurement Manual for review	Procurement staff, PMU	Oct 15, 2016	To be entrusted to the agency to be contracted for PIP.

Annex 3:

ToR for Environmental and Social Management Framework

I. Objectives of the Assignment:

The overall objective of the assignment is to identify, assess, and implement environmental and social management measures in respect of the improving tank systems performance and resilience, improving irrigation efficiency, inflow hydrology management, improving productivity, adapting sustainable agriculture practices, innovative and technology transfer for fisheries production, and agri-business promotion.

In order to achieve this objective, it is proposed to conduct comprehensive social and environmental assessments so as to enable the preparation of an Environmental and Social Management Framework (ESMF) for the specific identified investments. These will guide the interventions to ensure that the project activities do not cause any harm, are in compliance with the applicable national and local regulations, as well as World Bank safeguards policies. The relevant portions of the ESMF will be suitably integrated with the contract documents to facilitate smooth implementation during the rehabilitation and operation phases.

II. Scope of Work:

Part A: Social Assessment

It is well recognized that the project needs to take due cognizance of a number of stakeholders whose profile is not homogeneous, rather, quite diverse comprising a number of sub-groups identifiable on the basis of their differential endowment, gender, ethnicity, different economic groups and other regional features. Therefore, the challenge lies in addressing the requirements of the all the sub-groups, with special attention towards the rural and tribal poor and other normally socially excluded sub-groups. Besides, there are a large number of stakeholders, some internal and others external to the project, who would have varying degrees of influence and impact on project activities and outcomes. This makes it necessary for the project to provide a framework for participation of all key stakeholder groups and enable solicit their contributions towards project design and delivery mechanisms. To this effect, as a part of the project preparation, it is intended to conduct the Social Assessment (SA). Broad elements of the study shall include beneficiary assessment, stakeholder analysis, social impacts, institutional assessments and risks analysis. The assessment would be carried out consistent with GOI, GOAP and the World Bank safeguard requirements, policies, regulations and guidelines.

Outline of the Tasks

- Beneficiary Assessment -- comprising socioeconomic profiles at state, district and village level; the project beneficiaries' assessment on the current status of management and services; and the linkages thereof with governance mechanisms and the local operational arrangements.

- Stakeholder Analyses -- Identify stakeholders at different levels. Map Key Expectations, Impacts, Issues and Concerns as related to each stakeholder and the subgroups thereof.
- Impact Assessments -- identify positive and negative social impacts likely to occur for different sub-groups or beneficiaries as a result of project interventions; assess and prioritize impacts based on their significance; and suggest measures to minimize negative impacts and derive the maximum from positive impacts;
- Institutional Analysis – document the existing institutional and implementation arrangements, covering all key actors – government departments, sector institutions, political bodies, community institutions etc.—and conduct a SWOT analysis;
- Ascertain and analyze key social risks, internal and external, to the project and measures to address them;
- Identify Key issues to be addressed by the project and prepare a Social Management Framework to address the same which may include: adjustments into implementation arrangements, capacity building, IEC etc. This will also bring clearly implications, if any, in respect of the Bank’s Operational Policies on Involuntary Resettlement and Indigenous Peoples- OP 4.10 and OP 4.12, as well as local level human and institutional development;
- Prepare standalone documents : Resettlement Policy Framework and Tribal Peoples Planning/ Framework, and Gender Action Plans;
- Draw a mechanism for Redressal of Grievances; and
- Develop Monitoring and Evaluation arrangements.

Expected Outputs:

- i. Comprehensive report on Social Assessment along with Social Management Framework;
- ii. Resettlement Policy Framework (RPF);
- iii. Tribal Peoples Planning Framework (TPPF); and
- iv. Gender Action Plans (GAP)

Part B: Environmental Assessment

The environmental assessment should enable identifying significant issues and the related impacts associated with the interventions such as strengthening and upgradation of small-scale community-based irrigation systems, dam safety, improving irrigation efficiency, crop diversification, productivity enhancement through climate resilient/adaptive sustainable agriculture production, technology promotion in fisheries etc. These will be fed into a framework which will also detail out associated measures to: (i) enhance positive impacts; and (ii) mitigate negative impacts (if need be) and suggests institutional and implementation mechanisms to ensure the implementation of the measures.

Outline of the Tasks

Task 1: Laying down policy, legal, and regulatory framework: Reviewing the Environmental compliance requirement with respect to the project interventions; present an overview of Government of India’s and State Government’s environmental policies, legislations, regulatory and administrative framework in conjunction with the World Bank’s safeguard policies.

Task 2: Identify significant environmental issues associated with the project interventions,

Task 3: Assessing Environmental Impacts and Mitigation Measures: Assessing impacts (both positive and negative) of the proposed AIIAT project interventions/ issues and identifying the management measures to address the impacts. The management measures shall be presented in the form of EMF, which shall include the following:

- Based on the EA, EMF shall be prepared in such a manner that it provides adequate guidance for Tank System Improvement;
- The EMF shall include good practice guides, related to up-gradation and upkeep of the tank systems, agriculture enhancement. Responsibilities for execution and supervision of each of the mitigation shall be specified in the EMF. The ESMF shall list all mandatory monitoring requirements, check lists, formats for reporting etc.
- The EMF should be able to provide adequate guidance in proposing specific measures related to tank system improvement that are amenable to incorporation in the bidding/contract documents for pre-upgradation.
- Additionally, the EMF shall include as separate attachments, if applicable, Integrated Pest Management Plan, Natural Habitat plan to satisfy the safeguard requirements and the regulatory requirement of the GoI and GoAP. The EMF shall also cover the Occupational health and safety, Labour working conditions, Construction labour management, disposal of excavated soil, silt etc.
- The EMF shall include an adequate institutional structure and resources including financial budget to enable the PMU to undertake measures identified.
- The EMF should identify the large dams above 10 m height and should propose a plan for constitution of a dam safety panel which conducts regular monitoring and provides recommendations. The dam safety evaluation and monitoring systems that are put in place in the earlier phase need to be agreed to.

Field Visits: The EA and SA should cover a representative sample from the small-scale community-based irrigation systems identified for implementation in tribal areas, coastal areas and rainfed region. A minimum of 15 (3 in each of the 5 agro climatic zones) small-scale community-based irrigation systems should be covered for the field study

Expected Outputs

- v. Comprehensive report on Environmental Assessment along with Environmental Management Framework
- vi. Pest Management Plan
- vii. Dam safety plan
- viii. Natural Habitat Plan (if required)

Part C: Environment and Social Management Framework

Prepare an environment and social management framework integrating the results of Parts A & B

Data Base and Methodology (Suggested only)

The data/ information shall be generated from both primary and secondary sources. The former chiefly will comprise discussions/ consultations with different stakeholder groups using structured checklists. The latter will be based on library research drawing upon from various appropriate reports/ reviews / analytical studies from government and non-government as well as private sector sources. Following tasks may need to be undertaken to complete the assignment:

- Review of the existing studies, including any previous safeguards documentation available in the context of Andhra Pradesh
- Preparation of baseline of existing biophysical and socio-economic condition for the project areas – from primary and secondary sources
- Review of the environmental and social legislative framework – national, state, and local – and analysis of the relevant aspects of project activities which would need to comply with the provisions.
- Identification and assessment of potential environmental and social impacts of the activities proposed under the project, including impacts of different technologies, locations, and other project controllable alternatives.
- Formulation of management measures – following the hierarchy of Avoidance, Minimization, and Mitigation for negative impacts, and Enhancement of Positive Impacts
- Review the current capacity in the utility to implement the measures identified and suitable capacity building measures
- Preparation of block cost estimates for the management measures finalized in light of the above
- Preparation of relevant portions of the contract documents – BoQs, specifications for integration with the Bidding/Contract documents.
- Undertake consultations with stakeholders – including line departments in the government, NGOs, and also local people in identified sub-project areas
- Prepare ESMPs for the initially identified sub projects in line with the ESMF provisions.

Disclosure workshops

The study will hold consultations with stakeholders as a means to elicit explicitly the views of the community, beneficiary groups and women on their participation at all stages of the project. The findings of the draft report will be discussed with the primary stakeholders in the field to get their feedback. This shall be fed into the preparation of a final draft report which will be discussed in a broad based stakeholder workshop- one at state and the other at district level. All consultations should be properly documented and submitted with the final report.

III. Team Composition

The team shall include the following key personnel

Environmental Specialist: The person should have a graduate degree in environmental science/engineering or related discipline such as planning. S/he should have experience of at least 10 years in environmental assessment of linear projects. Preference will be given to persons with experience of working on projects supported by multi-lateral/bilateral funding agencies such as the World Bank.

Social Development Specialist: A Post Graduate in Sciences/ Social Sciences/ Social Development or with a Management Degree/ Diploma having at least 10 years of experience in the conduction of social assessments, formulation as well as implementation of resettlement and rehabilitation, and tribal development plans, especially in the linear projects. Preference will be given to persons with experience of working on projects supported by multi-lateral/bilateral funding agencies such as the World Bank, ADB, DIFID, KFW etc.

Gender Specialist: A Post Graduate in Sciences/ Social Sciences/ Social Development or with a Management Degree/ Diploma having at least 10 years of experience in the conduction of social assessments, including Gender Impact Assessments and formulation of Gender Action Plans. Preference will be given to persons with experience of working on projects supported by multi-lateral/bilateral funding agencies such as the World Bank, ADB, DIFID, KFW etc.

Communication Specialist: The person should have a degree in communications or a related field like social work. S/he should be clearly able to communicate, preferably in Telugu, with different groups of potentially affected persons. S/he should have experience of consultations over at least 5 years. Preference will be given to persons with experience of working on projects supported by multi-lateral/bilateral funding agencies such as the World Bank.

In addition, the team may include other members/associates as required by the selected consultant.

IV. Duration of the assignment

The assignment is expected to last 2 months with inputs of 6 person months, as above, from key staff and other support staff as determined by the consultant.

V. Deliverables

Milestones	Timelines (from issuance of contract)	Percentage of Payment against the deliverable (as % of total contract amount)
Inception Report	1 weeks	5%
Draft Social Assessment	6 weeks	20%
Draft Social Management Framework; Draft RPF and TPPF and GAP;	6 weeks	15%
Draft EA and EMF	6 weeks	20%
Draft ESMF and consultation workshops	7 weeks	20%
Final ESMF	8 weeks	20%

Annex 4:

Pillar B: Promoting Adaptive Sustainable Agriculture Production Systems

This component would improve production and productivity of the smallholder irrigation systems through relevant trainings and appropriate demonstrations for adoption of climate resilient technologies and farm practices, for increasing returns to farmers and other water users through better market linkages and promotion of agribusiness. This component will have three sub-components: (i) climate smart diversified agriculture production systems; (ii) innovation and technology transfer for fishery production; and (iii) climate-friendly market and agribusiness promotion.

Sustainable intensification and diversification of crop and horticulture production systems will be achieved by developing packages of higher payoff ecologically-conducive agriculture practices to suit different agro-climatic zones; decentralised production of drought/pest-tolerant seeds at the cluster level; enriching soil carbon stock to improve soil health and moisture retention; and improving water-use efficiency by water budgeting and water management practices covering ayacut of the project small-scale community-based irrigation systems as well as the rainfed areas in the project tank villages and cascades.

The project will focus on increasing farm productivity by reducing ‘input’ costs and enhancing ‘output’ from farming systems on a sustainable basis. This will be achieved by (a) adopting diversified cropping system on ‘navdanya’⁴ pattern to buffer weather anomalies; (b) promoting comprehensive, crop specific sustainable agricultural package of practices; (c) installation of integrated weather forecasting systems to provide weather-based crop advisories in selected smallholder irrigation cluster areas; and (d) developing a mechanism to quantify crop resilience to climate variability, and creating a baseline for quantifying soil organic carbon and GHG emission from crop production systems

B.1: Promoting Climate Smart Diversified Agriculture Production Systems

This subcomponent aims to increase productivity of field crops, vegetables and fruits; and promote diversification from rice to low water requiring, and high nutritional value crops like pulses, maize, groundnut, millets, vegetables and fruits. Climate risk resilience will be built into agriculture production systems by promoting cultivation of high-yielding, short-duration, drought-, pest- and disease-tolerant crop varieties/hybrids, complementary agronomic practices, and building ability to withstand expected biotic and abiotic stress through a large scale program of demonstrations, awareness building and training activities as well as investments in farm implements and resource saving technologies like micro irrigation systems to enhance water use efficiency and land productivity. Interventions will focus on irrigated command areas of the rehabilitated small-scale community-based irrigation systems, and will also cover rainfed areas in the project villages in tank cascades.

⁴ ‘Navdanya’ means nine seeds (a traditional diversified mixed cropping system which includes cereals, millets, and pulses), a system of farming that produces food while enhancing biodiversity, building soil fertility and conserving water.

Climate resilience crop farming. The crop production activities to be implemented by the Department of Agriculture and district Agricultural Technology Management Agencies (ATMAs) will aim at (i) increasing cropping intensity and productivity within ecological limits, (ii) promoting diversification to low water requiring crops, and (iii) promoting use of improved farm implements and tools.

Crop diversification will be achieved by increasing areas under pulses, maize, minor millets and ground nut. The water requirement of these crops is low, and pulses and groundnut, being leguminous crops, also improve soil fertility. Increased diversification through pulse production will be achieved through introduction of high yielding varieties of Bengal, red and black gram, provision of supplemental irrigation at critical stages of crop growth, introduction integrated pest management and raising seed replacement rate. The area under nutritious millets will be expanded by demonstrating cultivation of improved seeds and production practices for ragi (finger millet) and other millets. Special attention will be paid to produce quality seed of self-pollinated crops by organizing seed production demonstrations on pulses, groundnut and millets in the seed villages. While demonstrations on rice will be organized in all the project districts, pulse, maize, groundnut and millet production will be promoted in those districts which have a comparative agro-ecological advantage for producing a particular crop.

Integrated crop management (ICM) demonstrations and farmer trainings will be the core project activity and the main vehicle for the dissemination of improved technologies to farmers. The ICM demonstrations will include the complete package of practices for a particular crop from land preparation to harvesting of the crop. The demonstrations will focus on promoting high payoff interventions and reducing carbon and water foot print of cropping systems. Adoption of the demonstrated technologies will be systematically tracked and documented.

The project will support operationalization of web-based integrated weather forecasting and water management system to provide real time crop advisories; including water, pest and disease stresses resulting from climate anomalies; possible real time mitigation measures for managing these stresses and implementing contingency plans. A baseline of green house gas emissions from agriculture production systems will be established and changes regularly monitored.

Trainings and capacity building activities, and exposure visits will be organized for farmers in the latest crop production and water management technologies. Officers of Department of Agriculture and ATMAs will be trained in crop production technologies, including exposure visits and study tours to other states and overseas.

Horticulture development. The objective of horticulture program to be implemented by the Department of Horticulture, is to raise the productivity of identified fruit crops, vegetables, spices and flowers, and promote diversification from traditional crops to high value fruits and vegetables, and to improve their yield and quality. Specific tank command areas with access to tube well irrigation will be selected to provide assured irrigation for horticulture crops. Increased productivity will be achieved by promoting (i) use of seeds and planting materials of improved varieties and hybrids of vegetables like tomato, eggplant and okra, relevant spices and fruits; (ii) adoption of appropriate agronomic practices, integrated methods of nutrient, pest, disease and weed management, and (iii) adoption of improved irrigation practices such as micro irrigation with fertigation, and use of mulches. Plastic crates will be provided for reducing wastage and promoting farm level grading and post-harvest management. New plantations of mango, and

banana and flowers will be promoted. Disease-free and healthy seedlings of high yielding varieties of fruit crops, including tissue culture banana, will be planted.

Micro irrigation (drip irrigation with fertigation) will be promoted for efficient use of water, improving fertilizer use efficiency, increasing productivity and enhancing produce quality. The micro-irrigation equipment will be provided to eligible farmers on matching grant basis. The project will also promote a protected cultivation of flowers and vegetables, including construction of poly green houses and shade net houses, and demonstration of mulching technology. Training systems for tomato and gourd vines (*Pandal*) will also be supported.

Trainings and capacity building activities as well as exposure visits will be organized for vegetable, fruit and flower growers and officers of Department of Horticulture.

Annex 5:

B2: Innovation and Technology Transfer for Fishery Production

The main objective of the mission was to design the fisheries subcomponent (B2) and to determine the key investment areas in consultation with the Department of Fisheries. More specifically, aspects specifically focused during the mission were as follows:

- Key issues for the fisheries development to be addressed
- Type of project interventions and key investment areas
- Budget outline

Issues related to fisheries development:

Physical factors: The important elements are: (i) short seasonal water bodies (on an average has 6 months' water retention time); (ii) lack of suitable species and quality fish seed availability; and (iii) absence of appropriate species based fish feed availability.

Lack of technology accessibility: Minor irrigation small-scale community-based irrigation systems fisheries having significant production potential were mainly dependent on Indian major carps more suitable to perennial water bodies. Production models need to be redesigned for maximizing productivity in short and long seasonal water bodies which account for more than 90% of the total MI small-scale community-based irrigation systems. There is a large gap existing between the technology available and the technology accessible to farmers. Although scientific knowledge/technology are available with respect to improved production methods, approaches for community based fishing/farming, strengthening market systems and value addition, addressing health, environment and social concerns, etc., very little of this knowledge reaches the hands of practitioners in the field, including individual fish farmers, small private sector operations and communities.

Paucity in the regulatory policies: Although there is a policy regulation act (2005) on fish seed certification for ensuring quality of fish seed, the government has not fully implemented the compliance part of it so far due to lack of adequate support and capacity. The inputs such as fish seed and feed accounts to 70 to 80% of the operational cost and greatly influences productivity. To ensure quality of these vital inputs which govern fish production in the state, there needs to be effective regulation through a certification mechanism appropriately supported by the State Government.

Inadequate Institutional Capacity: Lack of skilled human resource and modern infrastructure facilities has constrained inland fisheries development in the state. The government needs to strengthen the linkage between research and extension to enhance the capacity for applied research, technology transfer, and extension services, and at the same time look for opportunities to link up with NGO and private sector service providers.

Principal elements of fishery development

The high degree of economic opportunities and benefits offered by the currently available or underutilized aquatic resources such as minor irrigation (MI) small-scale community-based irrigation systems consisting of 25,000 hectares of effective water spread area (EWSA) from

1,211 small-scale community-based irrigation systems will be the major consideration for the project interventions.

To facilitate sustainable development of the inland fisheries and to transform underutilized/underperforming water resources in minor irrigation small-scale community-based irrigation systems to productive levels, it is important to focus on the following areas with clear aims and objectives.

Policy reform to ensure input and product quality:

- providing a regulatory structure and certification to ensure compliance to the supply of quality inputs at required quantity, particularly feed and seed;
- decentralizing the supply of quality fish seed, and feed distribution system by supporting public and private small and medium enterprises; and
- ensuring all fish and fishery products marketed either for export or domestic consumption satisfy quality requirements cited in HACCP and other protocols.

Innovative climate resilient fish production models:

- Fish productivity can be significantly increased by introducing fast growing fish species, such as *Amur Carp*, Genetically Improved Tilapia (GIFT), *Jayanthi Rohu* and *Pangasius*. There is a need for developing appropriate production models considering short period of water availability in accordance with the micro climatic conditions of the project area for maximizing productivity and combating climate change.
- Pure line breeding program will be implemented to ensure the supply of improved quality of seed.
- Formulating species based fish feed using locally available ingredients not only reduces the cost of production but also contributes to the enhancement of fish productivity.
- Promotion of innovative technologies such as cage fish culture in open water in an environmentally sustainable manner. Beneficiaries of the open water fish culture will be landless poor fishers/farmers.
- Creating bio-security awareness, and providing support mechanisms to ensure bio-safety and disease surveillance that will significantly enhance quality of production and assist in better marketing in both domestic and export sectors.

Improved post-harvest technology and value chain participation:

- Promotion of value added and ready to cook products
- Improved fish transport in hygienic condition for wider markets in wholesale, retail and vending
- Establishing fish kiosks and markets at suitable locations

Budget outline and expected returns: The mission has facilitated preparation of a draft budget outline for fisheries subcomponent (Annex 4). The investments were mainly directed at three main interventions (1) policy reform, (2) innovative climate resilient production models for irrigation small-scale community-based irrigation systems and ponds, and (3) improve the post-harvest technology and value chain participation. Under those aspects, the funds were allocated targeting productivity enhancement, improvement in fish marketing, farmer participation in value chain and institutional capacity building while considering key issues which need to be addressed for the sustainable development of Andhra Pradesh inland fisheries.

The total budget proposed for implementing the fisheries component is Rs.150 Crore. which will benefit 40,000 landless fishers and marginal smallholder farmers generate additional employment of about 27, 000 persons. Successful implementation of the fisheries sub component will generate a return of Rs.413 Crore/year by the end of this project.

The mission carefully reviewed the proposed budget and sought clarifications from the Fisheries Department. A formal letter was sent to the Commissioner of Fisheries seeking clarifications.

Implementation arrangement: The fisheries subcomponent will be executed by the Andhra Pradesh Department of Fisheries (APDoF) in close collaboration with the Project Management Unit of APIIATP. The APDoF will create a cell at the headquarters, dedicated to manage the implementation of APIIATP. An organogram was prepared with detailed staff structure including district level personnel which was reviewed and finalized during the mission. The component will have special focus on strengthening the research-extension linkage. The project will make technical cooperation arrangements with the Central Institute of Freshwater Aquaculture (CIFA) and other relevant ICAR institutions. The project will make provisions to bring together researchers, extension officers and famers to demonstrate innovative fish production models, with a focus on inclusion of women farmers and entrepreneurs.

Annex 6:

Pillar C: Climate-friendly Market and Agribusiness Promotion

This subcomponent will aim at reducing the ‘road miles’ of agriculture commodities by bringing the producers, traders and consumers closer for locally produced goods by reviving/enhancing local farmers’ markets and developing alternate marketing channels to improve farm level post-harvest management and value addition. The AP Food Processing Policy (2015-20) lays emphasis on commodity-based cluster development to enable a focused and planned approach to reduce post-harvest losses, alongside addressing critical issues such as infrastructure planning and community development. The project will support development of farmer producer organizations (FPOs)/companies (FPCs), and facilitate public-private partnerships to enable direct buying arrangements at the local level. The key strategy will be to create collective marketing of farm surplus by farmers’ producer organizations.

The common service centers (CSC) are conceived as small scale aggregation places owned, managed and operated by FPOs. The project will finance ‘productive’ demand-driven investments, on a grant basis, to FPOs, for establishing CSCs. It will be provided based on the

business plans prepared by them. The grants provided under these activities will be supported at 80 percent of costs with 20 percent contribution in cash by beneficiaries. The mobilization of producer groups, FPOs and establishment of CSCs will be carried out by suitably qualified service providers hired by the project, primarily focusing on prioritized value chains. FPOs will undertake various activities such as bulk purchase of inputs for sale to individual members, marketing of produce, grading and quality control, and enhancing access to distant and higher value markets and bypassing the existing market inequities.

This component will adopt a value chain approach for improving productivity and profitability of agricultural commodities in project areas. The main field and horticultural crops grown in AP are rice, groundnut, pulses (Bengal gram, black gram, and red gram), maize, mango, banana, coconut and vegetables (tomato, brinjal and okra). The project preparation team will undertake a detailed analysis of the present value chains of these commodities for deeper understanding of chain structure and functioning. The VCA will focus on (i) mapping value chains to obtain a clear understanding of the sequence of activities and the key actors and relationships involved in the value chain; (ii) target markets for the given value chain; (iii) technological capacities across key actors in the value chains; (iv) analyzing the margins and profits within the chain; and (v) identifying the constraints and inefficiencies that prevent growth of the value chain.

For promoting an agri-business ecosystem in the state, the project will establish an Agri-Business Promotion Facility (ABPF) to foster and accelerate the growth of agribusiness, thereby helping to commercialize agricultural production, increase value addition and agricultural incomes. The ABPF will identify growth oriented entrepreneurs, who are pursuing business opportunities based on postharvest value addition in agriculture and allied sectors, and provide these entrepreneurs with a holistic service offering that accelerates their growth and increases their sustainability. It is expected that ABPF will have a catalytic effect, encouraging a new generation of entrepreneurs to enter, grow, and advance the agriculture sector in AP.

The ABPF will provide pre and post investment support for agri-entrepreneurs. This will include, among others, market scanning for business opportunities; conducting market and value chain studies of identified commodities; establishing and operating mentorship programs; scouting new technologies, including climate resilient technologies; assisting small and medium private entrepreneurs to prepare business and financial proposals; providing business readiness and business planning support to micro small and medium enterprises; and providing incubation services to emerging agri-entrepreneurs. It will also facilitate agriculture policy seminars, thereby providing a forum for relevant stakeholders to discuss improvements in the agribusiness investment climate.

For mitigating price risks the project will support operationalization of Negotiable Warehouse Receipts in AP.

This subcomponent will be implemented by Department of Marketing in cooperation with Departments of Agriculture, Horticulture and Agriculture Marketing, CAD and ATMAS.

The project will finance: (i) strengthening of ATMAS; (ii) setting up of PIUs in Departments of Agriculture, Horticulture and Agriculture Marketing; (iii) preparation and implementation of value chain action plans; (iv) demonstrations, trainings, exposure visits, workshops, etc; (v) micro irrigation systems, farm implements and tools; (vi) hiring of support organizations for

mobilization of commodity groups, FPOs and FPCs; (vii) setting up of Farmer Common Service Centers; (viii) setting up ABPF; and (ix) impact assessment. Related to the component activities, the project will finance subject matter experts/support staff, goods and equipments; consultancies/studies/trainings; minor civil works, and incremental operating costs.

Annex 7:

Economic and Financial Analysis

The project will be implemented by rehabilitating and modernizing 1,200 small-scale community-based irrigation systems in command areas covering 147,000 Ha of agriculture land to improve water delivery to irrigation systems. It is expected that total 200,000 people primarily in poor and marginal farm households will benefit directly from the project.

Project Costs: The total project cost is estimated to be USD 238.08 million (INR1,600 crores), and it will be distributed into four components. Around USD 111.6 million (around 46.9% of the total project cost) will be allocated to institutional strengthening and capacity building of WUAs, improving tank system performance and resilience, and in-flow hydrology management for water productivity and efficiency improvement. Around 90% of this allocation will go to the tank rehabilitation and modernization.

Around USD 111.1 million (around 46.3%) will be allocated to climate-smart diversified agriculture production practices, innovation and technology transfer for fishery production, and post-harvest management, marketing and agribusiness related activities. Out of this allocation, about 20% of the budget (around 10% of the total) will be allocated to the sub-component related to the fishery activities. The remaining 6.89% (around USD 16.4 million) of the total project cost will be allocated to the project management and capacity development related activities.

	Estimate at the end of the Identification Mission		
	INR Crore	USD (in million)	% of the Total Proposed Project Cost
Component A: Improving Irrigated Agriculture Efficiency at Farm Level	750	111.60	46.9%
Component B: Promoting Adaptive Sustainable Agriculture Practice	540	80.35	33.8%
B1. Climate Smart Diversified Agriculture Production Systems	390	58.03	24.4%
B2. Innovation and Technology Transfer for Fishery Production	150	22.32	9.4%
Component C: Climate -Friendly Market and Agribusiness Promotion	200	29.76	12.5%
Component D: Project Mngement	110	16.37	6.9%
TOTAL	1,600	238.08	100.0%

Project Benefits

1) Irrigated Area Expansion: A large part of expected incremental economic benefits is from expansion of the irrigated area attributed to the improvement of the irrigation system. Based on the previous experience in Andhra Pradesh, the project expects to increase around 30% of the fully irrigated area in the registered tank command area. The incremental economic benefits will be measured by subtracting the assumed land use patterns after a project implementation by the current land use patterns (which is assumed to be Without Project scenario) with incorporating the changes in yield patterns for each commodity. The contributing factors including technology, water security increase, new hybrid seed adoption, and other relevant factors for the yield increase will be analyzed.

2) Crop Diversification: The project expects incremental economic benefits from diversification of production systems toward higher value agricultural crops. A large part of the project area is currently under paddy production; however, a net economic effect for paddy is relatively small. The overall area under paddy production expects to come down and is expected to be replaced with commodities such as maize, groundnuts, vegetables, and fruits. Incremental economic benefits from diversification will be quantified and analyzed.

3) Fisheries: The project expects 25,000 Ha of Water Spread Areas (WSAs) of the tank command area will be promoted for strengthening the fishery activities. Furthermore, aquaculture will be introduced in 1,000 fish farm ponds. Incremental economic benefits will be estimated independently and aggregated using the tank and pond areas proposed under the project. By introducing fast growing and genetically improved fish varieties, as well as introducing species-specific fish feed production along with improving marketing infrastructure, annual fish production is estimated to increase to around 10 tons per ha of ponds and 1.5 tons per ha in the irrigated tank areas. Three sources of economic benefits are expected from the project, including net economic benefits from improved small-scale community-based irrigation systems, farm ponds, and fish seed production.

Sensitivity Analysis: A sensitivity analysis will be conducted to assess the impacts on the economic and financial returns of the project. Several scenarios will be analyzed including escalation of O&M costs, implementation delays, lower accumulated incremental benefits from the expansion, diversification effects, and technology effects.