KARNATAK NEERAVARI NIGAM LTD

KARNATAKA INTEGRATED AND SUSTAINABLE WATER RESOURCES MANAGEMENT INVESTMENT PROGRAM

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PROJECT SUPPORT CONSULTANT (PSC)

INCEPTION REPORT

March 2016

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ABBREVIATIONS & ACRONYMS

AC-IWRM	Advanced Center for Integrated Water Resource Management
ADB	Asian Development Bank
BRP	Bhadra River Project
BRRBC	Bhadra Reservoir Right Bank Canal
CADA	Command Area Development Authority
CDTA	Capacity Development Technical Assistance
CPM	Community Participation Management
CWC	Central Water Commission
DATC	District Agriculture Training Centre
DPO	Direct Potential Outlet
DPR	Detailed Project Report
DSS	Decision Support System
EA	Executing Agency
EARF	Environmental Assessment Review Framework
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
FAM	Facility Administration Manual
FAO	UN Food and Agriculture Organisation
FFS	Farmer Field School
FIDIC	International Federation of Consulting Engineers
GEO	Geotechnical Engineering Office
GoK	Government of Karnataka
HAMPI	Hampi World Heritage
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IEC	Information Education and communication
IEE	Initial Environmental Evaluation
INGO	International Non-Government Organisation
IWRM	Issues in Water Resource Management
KERS	Karnataka Engineering Research Station
KISWRMIP	Karnataka Integrated and Sustainable Water Resource Management Investment Program
KNNL	Karnataka Neeravari Nigam Limited
KVK	Krishi Vigyan Kendra (Agriculture Science Centre)
LBHLC	Left Bank High Level Canal
LBMC	Left Bank Main Canal
MASSCOTE	MApping Systems and Services for Canal Operation Techniques
MD	Managing Director
MFF	Multitranche Finance Facility

MIS	Management Information System
MOM	Management Operation & Maintenance
MOU	Memorandum of Understanding
MTR	Mid Term Report
NCA	Net Command Area
NEP	National Environment Policy
NGO	Non-Government Organisation
O&M	Operation and Maintenance
OJT	On the Job Training
PALMS	Productive Agriculture Linkages and Marketing System
PCC	Program Co-ordination Committee
PD	Project/Project Director
PIO	Project Implementation Office
PMIS	Program Monitoring Information System
PMMS	Program Monitoring Management System
PMU	Project Management Unit
PPMS	Program Performance Monitoring System
PPTA	Project Preparation Technical Assistance
PRA	Participatory Rural Appraisal
PSC	Project Support Consultant
QCBS	Quality Cost Based System
QPR	Quarterly Progress Report
RBC	Raya Basavanna Canal
RBHLC	Right Bank High Level Canal
RBLLC	Right Bank Low Level Canal
RFP	Request for Proposal
RICM	Regional Institute of Cooperative Management
RMP	Risk Management Plan
SC	State Steering Committee
SGoK	State Government of Karnataka
SHG	Self-Help Group
SMEC	Snowy Mountains Engineering Corporation
SPS	Safeguard Policy Statement
SRI	System of Rice Intensification
SST	Support Services Team
TLBC	Tungabhadra Left Bank Canal
TNA	Training Needs Assessment
ToR	Terms of Reference
TPRM	Tripartite Review Meeting
TRBC	Tungabhadra Right Bank Canal

VFG	Virtual Finance Group
VNC	Vijayanagara Canal
WALMI	Water And Land Management Institute
WBADMIP	West Bengal Accelerated Development of Minor Irrigation Project
WIS	Water Institution Specialist
WRD	Water Resource Department
WRIS	Water Resources Information System
WRS	Water Resources Specialist
WUA	Water Users Association
WUCS	Water Users Co-operative Society

EXECUTIVE SUMMARY

Project Background

Karnataka State (the State) is water stressed with increasing inter-sector water demands. Irrigation sector is the major user of water resources for agriculture. Due to competing demands, there will be significant decline in allocating water to agriculture demand. Meeting the anticipated rise in competing demands, particularly industry, domestic and ecosystem services, is a major challenge. This, if unmet, may constrain sustainable economic growth of the State. Water stress in the State is exacerbated by uneven spatial and temporal distribution of water resources and the predicted impacts of climate change. Better coordination between various water users (like industry, domestic and power) contributes to optimal management of limited water resources. Adopting an IWRM approach that promotes coordinated development and management of water, land and related resources will improve equitable economic and social welfare, while ensuring sustainability of the environment.

IWRM Principles:

1. Water is a finite and vulnerable resource, essential to sustain life, development and the environment;
2. Water development and management should be based on a participatory approach, involving users, planners and policy makers at all levels;
3. Women play a central part in the provision, management and safeguarding of water; and
4. Water has an economic value in all its competing uses and should be recognized as an economic good.

With the assistance of the Asian Development Bank (the Bank), the State Government of Karnataka has launched the Karnataka Integrated and Sustainable Water Resources Management Investment Program (the Program), which is expected to improve water availability for competing water demands in select river basins by implementing integrated water resources management (IWRM) and improving irrigation services delivery in the State.

It will support increased water use efficiency to provide economic opportunities, particularly to women and improve rural incomes. The Program will focus on the Krishna Basin, and specifically within the Tungabhadra Sub-basin for implementation of physical works. The IWRM activities will be implemented State-wide.

Program Implementation Arrangement

The Program will be implemented in two tranches (or projects) with 4-year Tranche 1 followed by 6-year Tranche 2 expected to commence after one year of Tranche 1 implementation. The Program comprises of the following three outputs:

- Output 1: State and basin institutions strengthened for IWRM
- Output 2: Irrigation system infrastructure and management modernized
- Output 3: Program management systems operational

SMEC has been entrusted as the Project Support Consultant (PSC) to provide support to KNNL through PMU and PIOs for implementation of Tranche-1 Gondhi Subproject Modernisation works and preparation of feasibility studies for select subprojects for modernisation in Tranche -2, VNC and TLBC (i.e. Output 2), and assist PMU with capacity building of KNNL, CADA, and WUCS as well as program monitoring and evaluation through the development and implementation of Program Performance Monitoring System (PPMS) and Management Information System (MIS)

(i.e. Output 3). The Output-1 activities will be mainly performed by PIO, Advanced Centre for IWRM (AC-IWRM).

As per the program implementation arrangement defined in the FAM for KISWRMIP, the PMU has been constituted and is located at the KNNL registered office in Bengaluru. The contract for the Project Support Consultant (PSC) has been signed on 20.11.2015 between KNNL and SMEC International Pty Ltd in association with SMEC India Pvt Ltd. The PIO has been constituted and is located at the UTP Zone office at Shimoga for Gondhi subproject implementation on 25.01.2016. The PIOs have also be constituted for VNC and TLBC and is be located at the ICZ office at Munirabad for all Tranche-2 subproject preparatory activities on 16.02.2016, and the office order from the Chief Engineer and Project Implementation Office, ICZ office, Munirabad in this regard is to release to the concerned agencies.

Description of the Select Subprojects

Gondhi Irrigation System comprising of Right and Left Bank Canals of 74.4 and 14.7 km long respectively has its supply from the Gondhi Anicut on the Bhadra River downstream of the Bhadra Dam and irrigates about 4,600 ha. There are 20 tanks within the right bank canal command area. Some of these are in-line storage where the canal crosses a valley on an embankment but most are within the command area. There are about 150 pipe outlets directly from the main canals. Some of these have gates but they are never operated. As a result, the release is often in excess of the requirement.

Under Tranche -1 Gondhi modernisation, the intervention envisaged under the system comprise of the following components:

1. Improvement of canals including provision of canal lining to suit future water delivery requirements. Lining is done by concrete paver lining.
2. Repair / replacement of all canal structures to support the future operational objectives.
3. Supply and installation of telemetry-based flow measurement at about 20 locations.
4. Command area development works
5. Capacity development of system operations staff and water users to enable them to effectively use the flow measurement system and provide a better water distribution service.

Vijayanagara Channel (VNC) Irrigation System comprises of 16 canals, most of which were originally constructed during the Vijayanagara Empire about 400 years ago. Most of the canals have their own diversion structures on the river and many of the canals are interlinked. The total command area is reported as 11,154 ha (but has probably been reduced by urbanisation) with command areas of individual canals ranging between 210ha and 2,220 ha. The modernisation of VNC Irrigation System will also comprise of modernisation of the most canal headworks in addition to works similar to Gondhi Irrigation System.

Tungabhadra Left Bank Canal (TLBC) system has a command area of 244,000 ha supplied from the Tungabhadra dam via a 227 km long main canal. Construction commenced in the 1960s and was envisaged as a system to supplement erratic rainfall during the kharif season. Tungabhadra Left Bank Main Canal with total length of 226 Km (141 Miles) was originally designed with a head discharge of 7,000 Cusecs up to Right outfall sluice (ROFS) located at Ch. 0+430 m beyond which the canal carries 4,100 cusecs. The main canal of TLBC has been modernised recently. The modernisation under KISWRMIP will comprise of main canal, particularly which was either not modernised earlier or damaged after the recent modernisation, and distributaries, minors and on-farm development works.

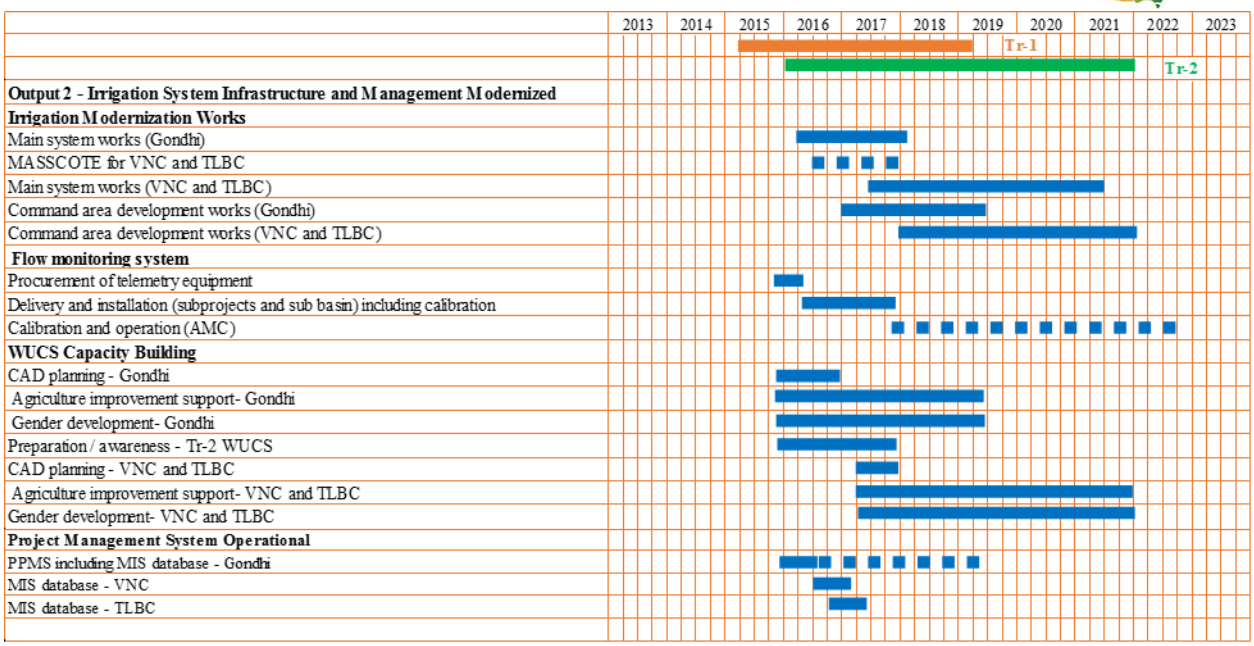
Basis of Inception Report

The PSC has prepared this Inception Report based on the findings and observations of several field visits, stakeholder discussions and meetings, and review of relevant project documents as follows:

- Request for Proposal (RFP) Brief and Terms of Reference;
- Discussion during Project Startup Meeting on December 23, 2015;
- Discussion during monthly review meeting held on January 25, 2016 in Shimoga;
- Discussions with KNNL and CADA staff in Bangalore, Shimoga and Munirabad on various occasions;
- Discussions with Agriculture Department in Shimoga;
- Discussions with the executives of Gondhi WUCSs;
- Site visit by Team Leader of Subproject areas during December 2015 and January 2016;
- Site visit of the Consultant team of experts December 2015 and January 2016;
- SMEC experience from similar nature projects globally;
- Experience of Consultant's team of experts dealing with similar projects;
- Review of relevant project documents:
    - Karnataka IWRM Concept Paper
    - KISWRMIP Facility Administration Manual
    - PPTA Reports for KISWRMIP
    - Gondhi Feasibility Study Report
    - Gondhi, VNC and TLBC DPRs
    - Several other relevant documents such as FAO Irrigation Manuals
    - FAO MASSCOTE Report for Gondhi Subproject

Technical Approach and Methodology

Following the good industry practices and research studies in relevant areas of the assignment, the Consultant has prepared the approach and methodology of expected tasks to be carried out during the assignment including the work plan and the project staffing and outlined the project implementation arrangement in detail so that the assignment can be completed over 42 months by providing adequate support to PMU and PIO to execute all Tranche -1 activities. Based on the enhanced understanding of the work scope and ground realities, the overall program implementation plan for KISWRMIP for outputs 1 and 2 as provided in the FAM including the detailed work schedule has been updated as follows:



Also, the approach and methodology has been updated for major aspects of the assignment, which are:

- WUCS Mobilisation and Awareness
- Capacity Building
- Social and Environmental Safeguards
- Agriculture Development
- Operation and Maintenance
- Project Monitoring Information System
- Civil Works Procurement
- Quality Control and Construction Management/Contract Management
- CAD Works

As the part of the capacity building program, PSC conducted a one-day training workshop on the construction management and quality control for proposed Gondhi modernisation civil works. As the part of the PPMS, the development of a web-page for the KNNL main website is underway that is expected to assist with uploading and archiving all relevant project documents prepared so far and will also offer user-controlled functionality to upload the future documents to be prepared under the program. The PSC will also utilise various WUCS outreach materials developed during the PPTA for the WUCS awareness outreach program for the Gondhi irrigation systems. The outreach materials are in the Kannad language and approved by the Water Resources Development for use, and cover the following themes:

- Importance of water
- Modernisation
- Role of Stakeholders in Irrigation Management,
- About Gondhi Sub Project
- Integrated Water Resources Management (IWRM)
- Tungabhadra Sub Basin
- Participatory Irrigation Management and

- Gender and Development and Benchmarking in Irrigation Project.

These materials will be revised to prepare similar outreach materials for VNC and TLBC. The report also includes the quality management, communication management, stakeholder management and risk management for the project. Some of project challenges and issues have been identified at this stage and possible approaches to address these challenges and issues suggested as well.

Various tasks and activities to be carried out by the PSC will be reported into the following deliverables:

#	Reports/Deliverables	Descriptions	Timing (from Start)
D01	Inception Report (Draft)	Outline of overall methodology to be used Work plan, deliverables Deployment schedule of key staff Training Schedule – output indicators for effectiveness of the training	Within 2 months of mobilization
	Inception Report (Final)		Within 3 months of mobilization
D02	Quarterly progress reports	Progress on Activities (Training, manual, safeguards, financial and procurement) compliance with safeguard requirements; and Progress toward output targets.	Within 30 days of the end of each quarter
D03	Annual report -1 Annual report -2 Annual report -3 Annual report -4	Report on work of previous year and cumulatively Impact of work done (Case studies, presentations etc.) Work expected in next year Key issues for attention of PMU, PIOs	Within 30 days of the end of **each calendar year**
D04	Midterm report	Report on progress upto mid-term review Work expected in remainder of project Impact of work done (Case studies, presentations etc.) Key issues for attention of PIOs, PMU (including any suggestions for restructuring related to this Consultancy)	18th months (middle of year 2 for Project-1)
D05	Project completion report (draft)	Report on the working of selected Gondi irrigation project WUCs ,	39 months (3 months prior to Tranche-1

#	Reports/Deliverables	Descriptions	Timing (from Start)
		other stakeholders the adherence to prescribed procedures and processes, content of discussions, the decisions made	completion)
	Project completion report (Final)	➕ Review of implemented Programs and activities ➕ Benefit flow to targeted members and training ➕ Contributions by other line depts. and PRIs, regular interaction with PRIs. ➕ Overall report for Project ➕ Lessons learnt	42 months
D06	Feasibility Report	➕ Feasibility Report	12 months

As far as the feasibility study reports for VNC and TLBC are concerned, as per the discussion with the PIO, Munirabad, it has been decided that the VNC feasibility study be completed first and submitted by end of July 2016, and simultaneously, PSC will also work on the feasibility of TLBC which will be completed by end of November 2016 i.e. after 12 months of commencement of the Services.

There will be a little change in the project staffing. The PSC Services involve significant project financial and economic analyses, particularly with VNC and TLBC that will require the inputs of a good **Project Economist**. However, there is no designated such position in the project team. In this regard, SMEC proposed that four months input of Water Institutions Specialist can be reduced and the same man months be utilised for input of Project Economist. SMEC was advised to prepare the Terms of Reference for the Project Economist and submit the same to PMU for necessary approval.

Project Challenges

Modernisation of the selected subprojects (i.e. Gondhi, VNC, and TLBC) covers a large geographical area involving large community with varied ethnic, political and social backgrounds. The Project stakeholders are scattered across the State and outside such as Bangalore, Shimoga, Munirabad, Dharwad, etc. Also, the selected subprojects in themselves are varied technical issues requiring innovative solutions. As a result, the Consultant expectedly foresees several challenges; some of them will be more evident as the Project progresses.

- WUCS Mobilisation

As per the requirement of the project selection criteria, the WUCSs in Gondhi need to be sensitised and made them conversant with the project requirements and their roles and responsibilities before the physical CAD works will start. In a similar manner, the water users of VNC and TLBC need to be mobilised and sensitised to form WUCS and endorse their commitment to share the modernisation cost for CAD woks. These are pre-requisites for the finalisation of feasibility studies of these subprojects.

This is indeed a challenging task, and will require full support from respective CADA offices and KNNL field offices in order to complete the feasibility studies and implementation of physical CAD works in time.

- Consultation with Stakeholders

As mentioned earlier, the Project covers a large geographical area with large community with diverse ethnic, socio-economic and political backgrounds. Also, the other project stakeholders are scattered across various locations in the State and outside. Consulting all of them as and when required is expected to be a serious challenge. The PSC will need the significant facilitation in this regard from KNNL and CADA operations at various operation levels.

Project Issues

- PIO Constitution

The FAM stresses the requirement of having individual PIOs for all subprojects selected for modernisation (Figure 17). It will be helpful for PSCs to interact with relevant engineers and officers of both KNNL and CADA on as-required basis if the PIOs are constituted with specifically designating officers on PIOs. For this reason, the PSC was also of the opinion that the PIOs for VNC and TLBC be constituted. PSC assisted TGB Munirabad to constitute PIO for VNC and TLBC as shown in Appendix D.

- Coordination between KNNL and CADA

There is a need for both KNNL and CADA to work together in tandem for successful implementation of the project. As per the institutional arrangement provided in FAM, PIO comprising officers of KNNL and CADA were brought under one platform called PIO.

- Ownership of DPRs for VNC and TLBC

Considering these subprojects are large by area and also technically complex, the modernisation works are scattered over the large area involving many structures. DPRs were prepared by the Consultants with involvement of KNNL engineers. As feasibility studies will be prepared based largely on the engineering designs and cost estimate and drawings covered in the existing DPRs, The PIO, Munirabad has made arrangements to bring the engineer engaged with consultants during preparation of DPR for VNC and TLBC. PSC would assist PIO in carrying out detailed review of the DPR in consultation with the consulting firm.

- Understaffing of CADA and KNNL Field Offices

Based on the information through the meetings with KNNL and CADA engineers and other officers, the Consultant observe that there is shortage of staff in field offices of Munirabad. This may be an issue during the feasibility studies when the Consultant specialists are mobilised to the field for community mobilisation, field verification of the proposed modernisation civil works and other information collection. PIO, Munirabad has taken measures to resolve the above issue by making necessary deputation of field officers.

1 PROJECT BACKGROUND

1.1 Introduction

Karnataka State (the State) is water stressed with increasing inter-sector water demands. Irrigation is the major user of water resources for agriculture. Due to competing demands, there will be significant decline in allocating water to agriculture demand. Meeting the anticipated rise in competing demands, particularly industry, domestic and ecosystem services, is a major challenge. This, if unmet, may constrain sustainable economic growth of the State. Water stress in the State is exacerbated by uneven spatial and temporal distribution of water resources and the predicted impacts of climate change. Better coordination between various water users (like industry, domestic and power) contributes to optimal management of limited water resources. Adopting an IWRM approach that promotes coordinated development and management of water, land and related resources will improve equitable economic and social welfare, while ensuring sustainability of the environment.

IWRM Principles:

1. Water is a finite and vulnerable resource, essential to sustain life, development and the environment;
2. Water development and management should be based on a participatory approach, involving users, planners and policy makers at all levels;
3. Women play a central part in the provision, management and safeguarding of water; and
4. Water has an economic value in all its competing uses and should be recognized as an economic good.

With the assistance of the Asian Development Bank (the Bank), the State Government of Karnataka has launched the Karnataka Integrated and Sustainable Water Resources Management Investment Program (the Program), which is expected to improve water availability for competing water demands in select river basins by implementing integrated water resources management (IWRM) and improving irrigation services delivery in the State. It will support increased water use efficiency to provide economic opportunities, particularly to women and improve rural incomes. The Program will focus on the Krishna Basin (Figure 1), and specifically within the Tungabhadra Sub-basin for implementation of physical works. The IWRM activities will be implemented State-wide.

The Program will be implemented in two tranches (or projects) with 4-year Tranche 1 followed by 6-year Tranche 2 expected to commence after one year of Tranche 1 implementation. The Program comprises of the following three outputs:

Output 1: State and basin institutions strengthened for IWRM

The output will strengthen institutional capacities of the Water Resources Department (WRD) and the Advanced Centre for IWRM (AC-IWRM) to implement IWRM in select river basins in Karnataka. This will include: (i) development and implementation of river basin plans to better manage water resources, (ii) capacity building and certification of the WRD (including its associated agencies like Karnataka Neeravari Nigam Limited [KNNL]) in IWRM with 30% of trainees being women, and (iii) improved water resources information systems.

Output 2: Irrigation system infrastructure and management modernized

This output will include: (i) modernization of irrigation infrastructure including installation of telemetry for canal flow measurement of three irrigation subprojects within the Tungabhadra Sub-

basin (Gondi Subproject under Tranche 1, and Vijayanagara Channel (VNC) and Tungabhadra Left Bank Canal (TLBC) under Tranche 2); (ii) strengthening asset management and main system operation and maintenance (O&M); and (iii) capacity building of inclusive water user cooperative societies (WUCS), with women representation, for improved operation, maintenance and water management within their respective command area.

Output 3: Program management systems operational

This output will focus on delivery of the above two program outputs on time and within budget.

1.2 Basis of Inception Report

This Inception Report has been prepared as the first deliverable of the assignment and is based on the following sources of information:

- Request for Proposal (RFP) Brief and Terms of Reference;
- Discussion during Project Startup Meeting on December 23, 2015;
- Discussion during monthly review meeting held on January 25, 2016 in Shimoga;
- Discussions with KNNL and CADA staff in Bangalore, Shimoga and Munirabad on various occasions;
- Discussions with Agriculture Department in Shimoga;
- Discussions with the executives of Gondhi WUCSs;
- Site visit by Team Leader of Subproject areas during December 2015 and January 2016;
- Site visit of the Consultant team of experts December 2015 and January 2016;
- SMEC experience from similar nature projects globally;
- Experience of Consultant's team of experts dealing with similar projects;
- Review of relevant project documents:
    - Karnataka IWRM Concept Paper
    - KISWRMIP Facility Administration Manual
    - PPTA Reports for KISWRMIP
    - Gondhi Feasibility Study Report
    - Gondhi, VNC and TLBC DPRs
    - Several other relevant documents such as FAO Irrigation Manuals
    - FAO MASSCOTE Report for Gondhi Subproject

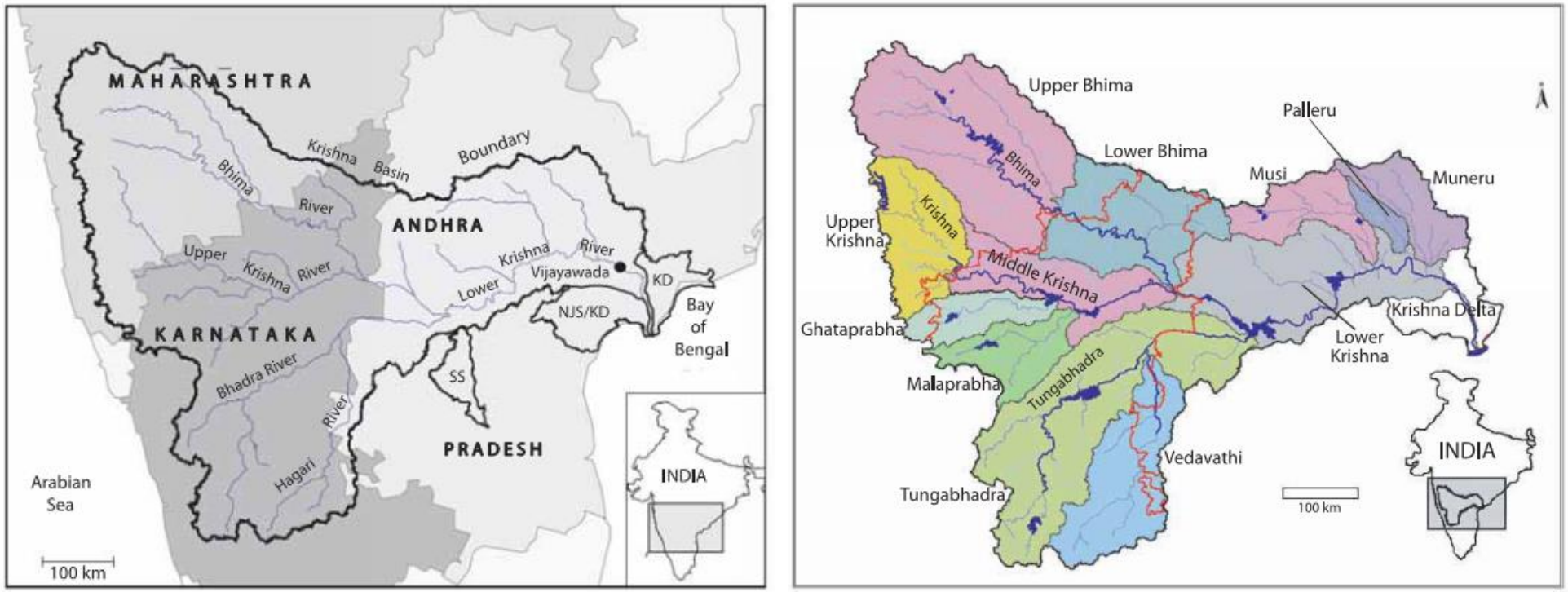


Figure 1: Krishna River network and sub-basins

1.3 KISWRMIP Subprojects Selected for Modernisation

The KISWRMIP is to include modernization of 3 irrigation areas: (i) Gondhi Irrigation system, which is a sub-area of the Bhadra Irrigation System (Tranche 1), (ii) Vijayanagara (VJN, Tranche 2) and (iii) part of Tungabhadra Left Bank Canal (TLBC, Tranche 2 and 3).

1.3.1 Gondhi Irrigation System

The Gondhi Anicut was built across the Bhadra River near Gondhi Village about 11.56 km from Bhadravati Town, Shimoga. It is located about 14.50 km downstream of the Bhadra Dam. It lies within the larger and more recent Bhadra Irrigation System but has its own supply from the Gondhi Anicut (Figure 2). The construction of Gondhi Anicut started in 1916 and completed in 1926. The Gondhi Right Bank Canal was commissioned in 1927, whereas the Gondhi Left Bank Canal started in 1951 and commissioned in 1954. There are 20 tanks within the right bank command area. Some of these are in-line storage where the canal crosses a valley on an embankment but most are within the command area.

There are about 150 pipe outlets directly from the main canals. Some of these have gates but they are never operated. The other outlets have no gates at all. As a result, the release is often in excess of the requirement. There is an access track on the side of the canal adjacent to the command area.

The Culturable Command Area (NCA) of the Gondhi System is about 4,600 ha. Some of relevant salient features of the system are given in Table 1.

Under Tranche -1 Gondhi modernisation, the intervention envisaged under the system comprise of the following components:

1. Improvement of canals including provision of canal lining to suit future water delivery requirements. Lining is done by concrete paver lining.
2. Repair / replacement of all canal structures to support the future operational objectives.
3. Supply and installation of telemetry-based flow measurement at about 20 locations.
4. Command area development works in 4,600 ha Area
5. Capacity development of system operations staff and water users to enable them to effectively use the flow measurement system and provide a better water distribution service.

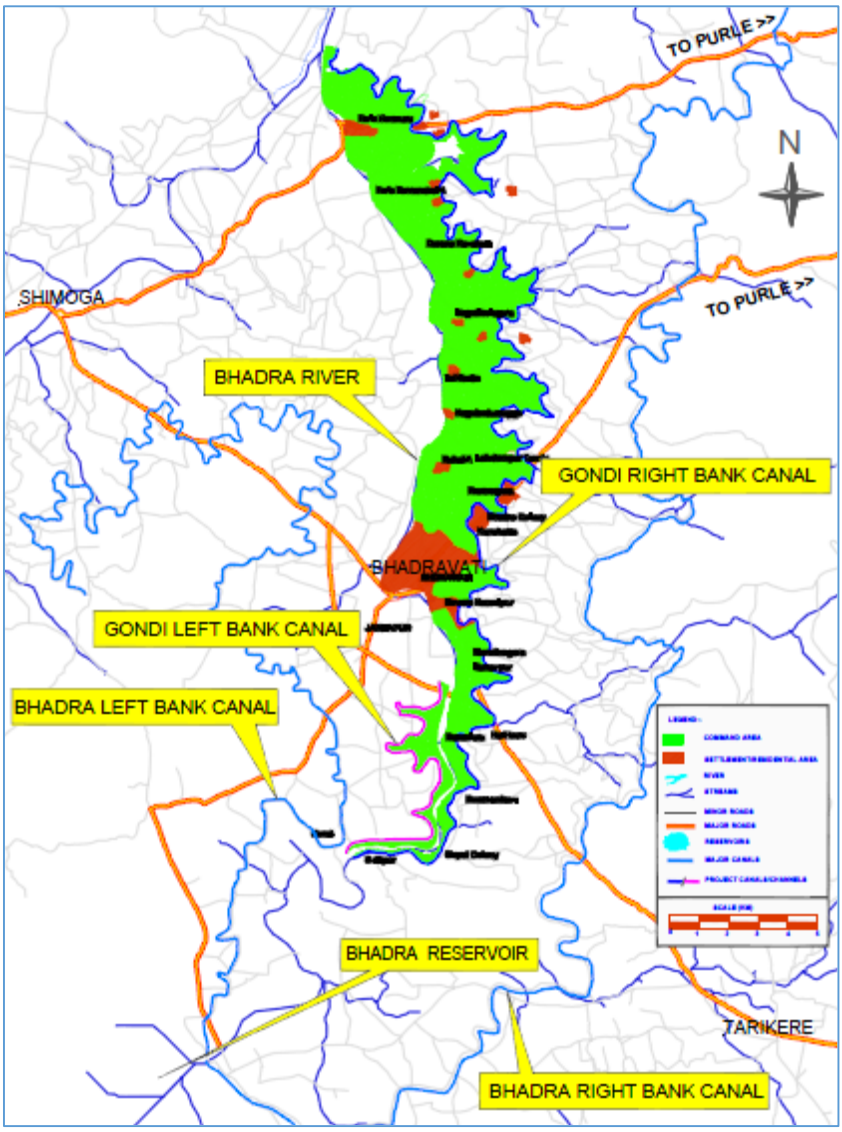


Figure 2: Bhadra Irrigation System along with Gondhi Irrigation System (PPTA, 2013)

Table 1: Relevant salient features of Gondhi Irrigation System

Particulars	Left Bank Area	Right Bank Area	Total
CCA (ha)	220	4380	4600
Main canal length (km)	14.7	74.4	89.1
Distributaries	0	16 No. / 34km	16
Cart bridges	20	86	106
DPOs on main canal	20	130	150
DPOs on distributaries		52	52
Drainage inlets	2	51	53
Relieving weirs	3	22	25
Escape sluices	0	6	6
Aqueducts	0	3	3
Tanks	0	20	20
Channel section	unlined	unlined	
Main canal alignment	contour	contour	

1.3.2 Vijayanagara Channels (VNC)

This system comprises 16 canals, most of which were originally constructed during the Vijayanagara Empire about 400 years ago. Most of the canals have their own diversion structures on the river and many of the canals are interlinked. The total command area is reported as 11,154 ha (but has probably been reduced by urbanisation) with command areas of individual canals ranging between 210ha and 2,220 ha (Figure 3).

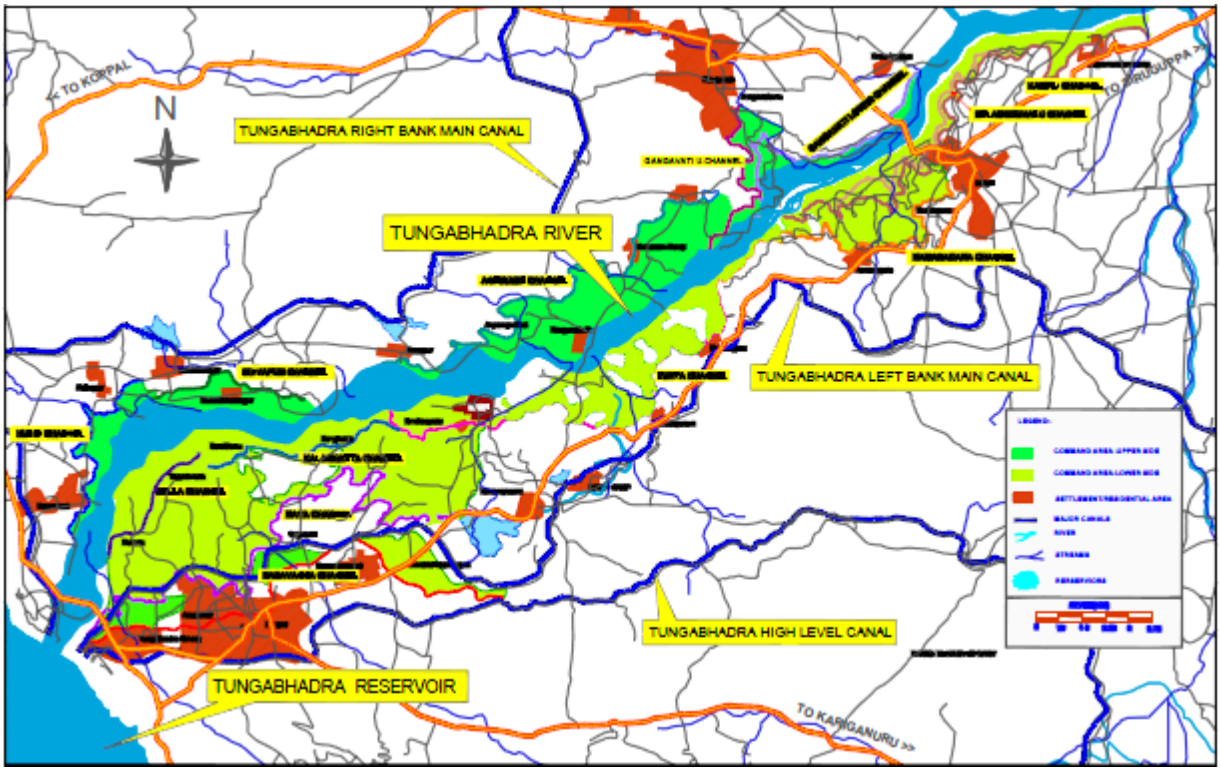


Figure 3: Vijayanagara upstream channels (PPTA, 2013)

1.3.3 Tungabhadra Left Bank Canal (TLBC)

Construction of dam across Tungabhadra River (i.e. Tungabhadra Dam) was taken up during 1944 by the erstwhile States of Madras and Hyderabad Governments from opposite banks on Right and Left side banks respectively near Mallapuram village to impound 133 TMC of water in the reservoir. The 1.739 Km long dam, with its two saddles on the left side was ready to impound the monsoon flow up to 491.62 m (1613 ft) level in the year 1953 and water was let in to the canals on both banks on 1st July 1953. However, erection of spillway gates, bridge, road on top of dam etc was completed by June 1958. As the reservoir submerged the Valvapur and Hosakote Anicuts constructed by the Rayas, a sluice was provided on right side of the dam with a lead channel to connect the old Raya and Basavanna canals to provide irrigation for 11 months. Similarly the old Koregal Anicut (Left flank of Valvapur Anicut) and its channel got submerged in the reservoir. Thus, a channel has been connected to the first distributary of left bank main canal to serve the old Ayacut.

The project comprised of construction of dam across Tungabhadra River near Mallapuram with masonry dam length of 1040 m including spillway of 701m, composite dam of 546.8 m and earthen dam of 152.40 m totalling to 1739.20m. The Tungabhadra dam has 5 canals taking off from sluices located in it. These are:

1. Right Bank High Level Canal (RBHLC)

2. Power canal on right side which is named as Right Bank Low Level Canal (RBLLC) beyond 21.09 Km
3. Raya Basavanna Canal (RBC on right side)
4. Left Bank Main Canal (LBMC) also called as **Tungabhadra Left bank canal (TLBC**)
5. Left Bank High Level Canal (LBHLC)

The TLBC system has a command area of 244,000 ha supplied from the Tungabhadra dam via a 227 km long main canal. Construction commenced in the 1960s and was envisaged as a system to supplement erratic rainfall during the kharif season. Tungabhadra Left Bank Main Canal with total length of 226 Km (141 Miles) was originally designed with a head discharge of 7000 Cusecs up to Right outfall sluice (ROFS) located at Ch. 0+430 m beyond which the canal carries 4100 cusecs.

1.4 Implementation Arrangement

The Program implementation arrangement has been portrayed by illustration given in Figure 4. Accordingly, the existing State Steering Committee (SC) for IWRM, chaired by Chief Secretary of the State and comprising representatives from all relevant departments, will provide policy direction and strategic guidance on matters relating to IWRM in Karnataka. This IWRM SC will also oversee the coordination of IWRM programs in the State and between agencies. The Program Coordination Committee (PCC) chaired by the Principal Secretary, Water Resources Department (WRD) will provide overall program and policy guidance.

The Program Management Unit (PMU) will be located within the KNNL in Bangalore, and will have day-to-day responsibility for implementing KISWRMIP. The Managing Director (MD), KNNL will be the Program Director (PD), who will implement the overall program under the guidance of the State IWRM Steering Committee and the Program Coordination Committee (PCC), with the support of the Project Support Consultant (PSC).

The PMU has been constituted and is located at the KNNL registered office in Bengaluru (**Appendix A**).

A Project Implementation Office (PIO) will be established within the Advanced Centre for IWRM (AC-IWRM), which will be responsible for implementation of all IWRM related activities of Output 1. For Output 2, each irrigation subproject to be modernized will have a dedicated PIO, which will be strengthened with specific technical expertise from the Command Area Development Authority (CADA) and PSC. The PMU working with the relevant PIO and PSC will monitor overall program execution and will be responsible for monitoring and reporting. PSC will provide technical support for project implementation.

The contract for the Project Support Consultant (PSC) has been signed on 20.11.2015 between KNNL and SMEC International Pty Ltd in association with SMEC India Pvt Ltd.

As per the decision made during the start-up meeting on 23.12.2016 (**Appendix B**), the PIO has been constituted and is located at the UTP Zone office at Shimoga for Gondhi subproject implementation on 25.01.2016 as shown in **Appendix C**.

The PIOs have also be constituted for VNC and TLBC and is be located at the ICZ office at Munirabad for all Tranche-2 subproject preparatory activities on 16.02.2016 as shown in **Appendix D**, and the office order from the Chief Engineer and Project Implementation Office, ICZ office, Munirabad in this regard is to release to the concerned agencies.

There will be two main packages, one for each tranche (or project) of the overall program. It is the implementation of the Tranche-1 subproject i.e. Gondhi modernisation that SMEC

International Pty Ltd (The Consultant) has been commissioned for. Furthermore, according to the guidelines provided in the Facility Administration Manual (FAM) for KISWRMIP, SMEC will prepare the feasibility study reports of Tranche-2 subprojects (i.e. Vijayanagara Channel and Tungabhadra Left Bank Canal) and support the relevant PIOs to prepare Detailed Project Reports (DPRs).

For the implementation of field outreach program in the Gondhi Subproject, the PSC will also include support services teams (SSTs) for training, capacity building and hand holding support to the Water User Cooperative Societies (WUCS), and will be based in PIO, Shimoga. For the second tranche due to involvement of large number of WUCS's, the KNNL (in conjunction with PSC) will recommend the most appropriate mechanism for field outreach program in VNC and TLBC command areas.

Figure 4: Implementation arrangement for KISWRMIP

2 OBJECTIVES AND SCOPE OF PSC SERVICES

2.1 Objectives

The PSC for tranche-1 will support implementation of Outputs 2 and 3 and coordinate on relevant aspects of Output 1 for IWRM. The PSC will provide:

- close support to PMU and PIOs for all aspects of Program implementation (including coordination and any contributions required for Output 1);
- capacity building and strengthening of relevant institutions associated with Output 2, specifically PIO and WUCS;
- monitoring and quality control of both the institutional processes and arrangements and the construction works for Gondi irrigation subproject;
- coordination with relevant agencies and other consulting services such as environmental and effects monitoring agencies;
- required support and technical expertise to the PMU for WUCS support for Gondi irrigation subproject and awareness raising on Tranche-2 subprojects;
- planning and coordination of project designs for Tranche-2 subprojects (Tungabhadra Left Bank Canal and Vijayanagara Channels) and the preparation of relevant feasibility reports
- required support and technical expertise to the PMU program performance management systems including establishment and use of management information systems (MIS) database for planning and reporting, preparation of inception and periodic progress reports, etc.

2.2 Scope of Works

The consultant services are to be provided in support of executing Tranche-1 according to the Facility Administration Manual (FAM). The key tasks to be carried out during assignment have been identified as given in Table 2, which also identifies the responsibilities of individual experts.

Table 2: Key tasks under the PSC Services

Task No	Description of Tasks	Key Experts[1]										
		TL	DTL	O&M	INST	AGRI	ENV	SOC	CMS	COM	MIS	PROC
1.0	**Project Initiation**											
1.1	Project Initiation											
1.2	Team Mobilization and Deployment of Staff											
1.3	Start-up Meetings with KNNL Officials to gain understanding of project activities											
1.4	Office Set-up and Logistic arrangement											
2.0	**Preparation of Inception Report**											
2.1	Collect and review of project documents											
2.2	Discuss with project stakeholders											
2.3	Carry out site visits											
2.4	Review of methodology and work plan											
2.5	Review of deployment schedule of consultant team											
2.6	Preparation and presentation of the inception report											
2.7	Submission of Inception Report											
3.0	**Overall Coordination and Implementation**											
3.1	Support and coordinate with PMU, PIOs and other relevant agencies for output -2 and output -1 for program implementation											
3.2	Prepare Program Implementation plan (PIP) and Annual Implementation Plan (AIP)											
3.3	Provide overall technical and management support to the PMU and PIOs for the successful implementation of the Project											

[1] Note:
Irrigation Specialist/TL (TL), DTL /PIM (PIM), O&M Specialist (O&M), Water Institutions Specialist (INST), Agriculture Specialist (AGRI), Environment Specialist (ENV), Social Development & Gender Specialist (SOC), Construction Management Specialist (CMS), Communication Specialist (COM), MIS Specialist (MIS), Procurement Specialist (PROC)

Task No	Description of Tasks	Key Experts[1]										
		TL	DTL	O&M	INST	AGRI	ENV	SOC	CMS	COM	MIS	PROC
3.4	Support and coordinate with other relevant agencies (FAO, ICRISAT) for improved agricultural production											
3.4.1	Improve the agricultural productivity											
3.4.2	Establish market linkages											
3.4.3	Support to agricultural development program											
3.4.4	Demonstrate diversified crops system											
3.4.5	Provide farmer training in irrigation technology											
4.0	**Capacity Building**											
4.1	Provide technical training in ADB procurement, financial management and project to PMU , PIOs											
4.2	Provide training in ADB communications policy and safeguard procedures											
4.3	Prepare subproject implementation guidelines, manuals, PIOs and training to PMU, PIOs and other staff											
4.4	Identify the long term capacity building and training needs of KNNL, WRD, CADA and other relevant agencies											
4.5	Prepare a training program with estimated costs											
4.6	Develop training program implementation and information dissemination strategy, associated budgets and draft ToRs											
4.7	Support PIOs and others for participatory irrigation management and improve O&M											
4.7.1	Participatory Irrigation Management											
4.7.2	Operation and Maintenance											
4.7.3	Preparing subproject O&M Plan											
4.7.4	Training to Project Staff and WUCS on O&M and SST											
4.8	Prepare training manual for WUCSs technical training & capacity building in construction technique											

Task No	Description of Tasks	Key Experts[1]										
		TL	DTL	O&M	INST	AGRI	ENV	SOC	CMS	COM	MIS	PROC
4.8.1	Process Planning											
4.8.2	Program Designing											
4.8.3	Project Implementation											
4.8.4	Operation and Maintenance											
4.9	Prepare implementation guidelines to Gender Action Plan(GAP) for women's participation in KISWRMIP											
4.10	Prepare relevant implementation guidelines, safeguard documents for resettlement											
5.0	**Subproject Development**											
5.1	Prepare feasibility study reports for VNC and TLBC											
5.2	Assist with the preparation of detailed project report											
5.3	Review packaging of contracts, initial bidding documents and contracts											
5.4	Support for quality control for Gondi Subproject											
5.5	Support progress monitoring of Gondi modernisation works											
6.0	**Program Performance Monitoring System**											
6.1	Develop the optimal approach for data gathering, storage and use for planning and monitoring											
6.2	Develop a MIS database and enter data											
6.3	Develop program monitoring indicators											
6.4	Analyze data on implementation progress											
6.5	Undertake and report monitoring and evaluation activities											
6.5.1	Establish environmental and social safeguard monitoring system											
6.5.2	Monitor environmental and social safeguards											
7.0	**Program and Financial Management**											

Task No	Description of Tasks	Key Experts[1]										
		TL	DTL	O&M	INST	AGRI	ENV	SOC	CMS	COM	MIS	PROC
7.1	Provide technical support to PMU and PIOs in program and financial management as required											
8.0	**Documents/Reports to be Submitted**											
D1	Draft Inception Report											
	Final Inception Report											
D2	Quarterly Progress Reports											
D3	Annual Reports											
D4	Mid-Term Report (Tranche-1)											
	Mid-Term Report and Review from Client (Tranche-1)											
D5	Draft Project Completion Report (Tranche-1)											
	Final Project Completion Report (Tranche-1)											
D6	Feasibility Report for Tranche -2											
9.0	**Deployment of WUCS Support Service Team (SST) for Gondi Subproject**											
9.1	Support PIO for Deployment of WUCS SST for Gondi Subproject											
10.0	**Support PIO and PMU during Periodic Reviews by KNNL and ADB**											
10.1	Support PIO and PMU during periodic reviews by KNNL and ADB											

Note:
Primary responsibility
Supporting responsibility

3 STATUS OF TRANCHE-1 ACTIVITIES

There are several Tranche-1 activities currently ongoing that keep relevance with the PSC activities. The PSC consultants carried out field visits of the selected subprojects to appreciate with the selected irrigation systems and related infrastructures. The Consultant visited various KNNL offices in Shimoga, Munirabad and Bangalore, and discussed the scope of works with the KNNL officers to understand the PSC tasks with greater clarity. The Consultant also visited a few WUCS offices in Gondhi Subproject and discussed with WUCS representatives about the status of WUCS establishment and their current activities.

3.1 Field Visits and Meetings

3.1.1 Visit to Gondhi Headwork and Canal System

The Consultant visited the Gondhi Headwork and canal system on a few occasions (17/12/2015; 04/01/2016) along with the KNNL officers from the Executive Engineer's Office, Bhadravati. The officers showed the headwork and relevant sections of canal systems to the Consultant, and explained the issues with existing off-farm conveyance system, particularly silted and widened canal section infested with weeds affecting the canal discharge capacity (Plate 1).

Plate 1: Visit to Gondhi System-widened and weed-infested channels

The KNNL officers expressed the concerns over the proposed modernisation design of the Gondhi System, especially with regard to the canal lining and the aqueduct. The proposed design for canal lining in the Gondhi modernisation includes plain cement concrete lining the Consultant believes that for economic reason, this is almost the industry practice throughout India, where protective canal lining such as one proposed in the Gondhi modernisation is normally plain cement concrete (PCC). Nevertheless, the lining around the hydraulic structures such as canal falls, head and cross regulators, siphons and aqueducts, and so on, which is also known as hydraulic lining, is often reinforced cement concrete (RCC).

On Jan 04, 2016, the Consultant made another visit to the Gondhi Canal System under the guidance of PSC PIM specialist, who happened to be the part of PPTA Team for KISWRMIP. The team visited the Gondhi aqueduct (Plate 2), which is reported to be leaking and its rehabilitation has been incorporated into the current modernisation works. However, the severity of leakage could not be ascertained as the canal was closed during the visit.

The system has deteriorated and water is no longer able to pass along the whole length of the right main canal resulting in the tail area of the Gondhi system being dependent on return flows from the Bhadra System. This is, at best, an unreliable source of water and will reduce in the future as the Bhadra System is managed more efficiently.

Plate 2: Visit to Gondhi Aqueduct to be rehabilitated for leakage

3.1.2 Visit to VNC Subproject

On December 18, 2015, the Consultant visited the CE Office, Munirabad to appreciate with the status of the Tranche-2 subproject preparatory activities. As per the information obtained therefrom, the CWC has already given its approval for the VNC subproject modernisation proposal put forwarded by the CE office, whereas the CWC approval for TLBC modernisation proposal is review and expected to be available soon.

Along with the project staff of the CE office, the Consultant also took a short trip of the VNC subproject areas, particularly the first intake to appreciate with its technical details and arrangements to divert the water to the channels (Plate 3). It was observed that some of canal system infrastructures are really old and require immediate refurbishment. Many of the canals are in poor condition and provide an unreliable supply of water The project officers expressed that the maintenance of the system has been deferred for some years in the view of the expected modernisation under the KISWRMIP, and the modernisation works must begin the earliest possible before the canal operation are critically affected due to poor infrastructures.

Plate 3: Visit to Vijayanagara Channels

Also, the Consultants including Environmental Specialist visited, on 29-30 January 2016, the Vijayanagara Channel reaches that pass through the HAMPI World Heritage area in order to obtain the first-hand preliminary appreciation of environmental concerns associated the civil works of VNC modernisation (Plate 4). The Consultants visited the nodal office of The Hampi World Heritage Area Management Authority housed in HUDA complex in Hospet Town and discussed with the Conservation Officer in greater depth regarding various compliance issues. It

is to be noted that the selection of construction materials and techniques for modernisation of civil works should comply with the relevant Heritage guidelines.

Plate 4: Visit to Vijayanagara Channels in HAMPI World Heritage areas

3.1.3 Visits to TLBC Subprojects

Two visits to Munirabad (18 December 2015 and 29-30 January 2016) were made during inception to appreciate with the issues with current canal infrastructures. The Consultants discussed with the KNNL ICZ officers about the project issues to understand the nature and scope of modernisation works, WUCS, and existing management structure for TLBC (Plate 5).

Plate 5: Meeting with KNNL and CADA officers in Munirabad

It was learnt that the TLBC Main Canal has long and frequent history of breaching due to soil conditions

Plate 6: Canal embankment slips in TLBC (TLBC DPR, 2015)

Also, it was reported that a disproportionate amount of water is used for paddy production in the head reach of the command and water is reported to rarely reach the tail areas. New concrete lining has been provided for most of the main canal and some of the distributaries in order to reduce conveyance losses. Groundwater is used to supplement canal water supplies in all the command area and, within about 5km of the Tungabhadra River, pumped river water is a major

3.1.4 Consultation with Individual Members of Project Stakeholders

As of now during the inception, the Consultants have visited various offices of the relevant project stakeholders such as KNNL Executive Engineer office, KNNL Superintendent Engineer office, and CE office, CADA, Agriculture Department and Gondhi WUCS at Shimoga, and CE office, Munirabad. During these visits as well as during formally and informally organised meetings, the Consultants have consulted several officers of KNNL, CADA and Agriculture Department and discussed in detail about the projects and associated issues and challenges, the project activities of the respective departments in the subproject command areas at micro level as well as at the State and national levels. Some of relevant members consulted by the Consultants are given in Table 3.

Table 3: Individual members of project stakeholder organisations during inception

No.	Name	Designation	Organisation
1	R Rudraiah	Project Director, PMU, KISWRMIP & Managing Director, KNNL	KNNL, Bangalore
2	M G Shivakumar	Superintendent Engineer (RO)	KNNL, Bangalore
3	S Manjunath	Executive Engineer	KNNL, Bangalore
4	C S Nagendra	Executive Engineer (Designs)	KNNL, Bangalore
5	D S Harish	Technical Assistant (Designs)	KNNL, Bangalore
6	Eshwar Chandra K S	Technical Assistant (Designs)	KNNL, Bangalore
7	C B Niranjan	Assistant Engineer	KNNL, Bangalore
8	A S Patil	Chief Engineer	UTP Zone Shimoga
9	S Nanjundaswamy	Deputy chief Engineer	UTP Zone Shimoga
10	Avinash G B	Assistant Engineer	UTP Zone Shimoga
11	B N Paniraju	Superintendent Engineer	Bhadra Project Circle, BRP
12	R Ravichandran	Executive Engineer (I/C)	No. 4 BRLBC Division & Assistant Executive Engineer No. 3, BRLBC Sub Division
13	Pradeep M	Assistant Engineer	O/o EE, No. 4, BRLBC Division
14	Narasimha Murthy	Deputy chief Engineer	ICZ, Munirabad
15	Bhoja Naik	Superintendent Engineer	Tungabhadra Project Circle, Munirabad
16	S B Nagabhushan	Executive Engineer	No.1, TR Division, ICZ, Munirabad
17	Lalitha Prasad	Assistant Executive Engineer	No.1, TR Division, ICZ, Munirabad
18	Wali Shah	Deputy Administrator	CADA Munirabad
19	Shashidar A R	WUCS Assistant Registrar Co-operative Society	CADA Shimoga
20	Tippeswamy L	Assistant Registrar Co-operative Society	CADA Munirabad
21	Chikkalingana Gowda	Irrigation Inspector	CADA Munirabad
22	M Shivaswamy	Director	CADA Directorate, Bangalore

23	Syed N Khadri	Superintending Engineer	CADA H/O Bangalore
24	Farid Khan	President	Gondhi WUCS
25	Others	KNNL HO, Shimoga and Munirabad Offices, AC-IWRM Office	

3.1.5 Meetings

3.1.5.1 Startup Meeting

The Startup meeting was held under the chairmanship of the Project Director and Managing Director, KNNL at the KNNL Registered Office, Bengaluru on 23/12/2015. The KNNL officers participated in the meeting from various KNNL project offices such as ICZ office and Munirabad and UTP office, Shimoga as well as KNNL Registered Office, Bengaluru. Among the participants were also the Director and Superintendent Engineer from CADA office, Bengaluru. The proceedings of the Startup Meeting is given in **Appendix B** for reference.

The PSC Team Leader presented the Consultant's understanding of the scope of the works of the consulting services and discussed with the participants to seek for enhanced clarity. The Project Director stressed upon the PSC to expedite the preparation of the Tranche-2 subprojects (VNC and TLBC) feasibility study reports so that the Tranche-2 subprojects can be implemented in 2016.

3.1.5.2 Review Meeting

The monthly review meeting was held under the chairmanship of CE, UTP at the CE Office, Shimoga on 25/01/2016. The PSC Team Leader presented briefly the scope of work, role of KNNL, CADA and PSC in IWRM, implementation of KISWRMIP and purpose of consulting services. The proceeding of the meeting is given in Appendix C for reference.

The meeting stressed the need of establishment of PIO for the implementation of the Tranche-2 subprojects as well in the CE office, ICZ, Munirabad. The Chairman stressed upon the PSC to hold the contract management training for the officers as early as possible as this may be handy for the KNNL officers in the contract management of the Gondhi modernisation contracts.

3.2 Gondhi Modernisation

3.2.1 Mobilisation of Civil Contractor

The civil contractor has been selected through competitive bidding for civil works of Gondhi modernisation and the contract awarded to RPP Infra Projects Ltd on 26.02.2016. The major civil works include the channel desilting and reshaping, lining and provision of canal structures. The contract period is about 2 years, over which, the canal desilting, reshaping and lining will be carried out mostly during the routine canal closures. As per the current operation schedule of Gondhi Irrigation system, there are two closures annually from mid-November to end of December and the month of June. Most civil works need to be completed during four scheduled closures over two years.

3.2.2 Installation of Flow Monitoring Telemetry

The contract for flow measurement and telemetry- supply and installation has been awarded to M/s HydroVision GmbH in JV with Canary's Automation Pvt Ltd on 23.11.2015.

Improved flow measurement and monitoring is one of the mechanisms to improve water management within the irrigation systems and also enable improved water resource management within the sub-basin. In addition to improved flow measurement provided as part of the irrigation modernisation sub-projects, improved flow measurement will be provided at key points for all the major irrigation systems within the sub-basin. All flow measurement installations will include telemetry for immediate transmission of data to a central server where the data will be automatically processed and made available for use by system operators WUCS and the general public. Rain gauges and hydro-met stations will also be provided at selected measurement locations in order to improve the data available for efficient operation.

The proposed distribution of flow measurement installations for installation in Tranche 1 is listed in Table 1. This initial network serves four functions:

- To facilitate improved understanding of water distribution and enable better management of the Bhadra system (particularly where it interacts with the Gondhi system)
- To enable better flow measurement and management of the Gondhi system
- To provide real-time flow data for the main abstraction points on the Tungabhadra river system
- To provide a coarse real-time flow measurement network on the other (i.e. except Bhadra and Gondhi) main canals in the sub-basin as a first step towards having a dense network of electronic flow measurement.

A contractor for supply and installation of telemetry equipments has already been selected through the competitive bidding and will be mobilised very soon.

Table 4: Summary of locations of telemetry for flow measurement in Tungabhadra Sub-basin

Scheme / Canal	Number of Installations	Remarks
Bhadra Right Bank	52	Head regulator, heads of distributary 1 to 22 and other major locations
Bhadra Left Bank	4	Head regulator and 3 sub-division boundaries
Tunga Canals	5	Head regulator and division boundaries
Singatalur Lift Irrigation	2	One at head of each main canal
Tungabhadra Left Bank	7	Outlet from dam, division boundaries plus heads of distributary 54 and 76
Tungabhadra Right High Level (in Karnataka)	4	Outlet from dam, sub-division boundaries
Tungabhadra Right Low Level (in Karnataka)	5	Outlet from dam, sub-division boundaries
Raya / Basavanna	1	At outlet from dam
Gondhi irrigation system	**20**	**Head regulators, selected points on main canals and on drainage system**

3.3 Feasibility Study of Tranche 2 Subprojects

For Project–1, the Gondi subproject was studied under the PPTA, and appraised by WRD, KNNL and ADB. For Tranche-2 subprojects, KNNL has already prepared the detailed project reports (for Vijayanagara [VNC] and Tungabhadra Left Bank Canal [TLBC]) and the socio economic baseline survey for TLBC was completed during the baselines survey.

During the visit to Munirabad in December 2015 and January 2016, the Consultant was informed that the CWC approval for modernisation of VNC has already been obtained, whereas the application for CWC's approval for TLBC has also been made and is under review.

The subproject DPRs prepared by KNNL include the detailed assessment of modernisation works to be carried out including the justification of works, engineering designs and cost estimates. Based on these DPRs, the PSC will prepare the subproject feasibility reports that will

satisfy all the subproject selection criteria for the approval of ADB, SGOK and other relevant agencies.

3.4 Status of WUCS

One of the criteria for the subproject selection for ADB's funding support is the endorsement by the WUCS's including the set beneficiary contribution requirement. In implementing individual subprojects, the KISWRMIP will involve WUCS in key decision making stages at subproject and micro level planning, implementation, and O&M. Specific works based on such decision will be implemented by the responsible organizations, and monitored by the WUCS. In principle, substantial WUCS strengthening will be pursued upfront to achieve the specific performance targets set, following which infrastructure modernization will commence. In this perspective, it is important to understand the current status of WUCS institutionalisation in the subproject areas to develop a realistic methodology for WUCS institutionalisation as well as adequate capacity building.

3.4.1 Gondhi Subproject

With regard to WUCS, as per the available information from the Bhadra CADA, there are 9 WUCS formed under Gondi Anicut (Table 5). All the 9 WUCS are under the Gondi Right Bank Channel and no WUCS has been formed in the Gondhi Left Bank Channel, although, there is an area of 220 ha under it). According to WRD/KNNL, originally 13 WUCS were proposed to be formed under Gondi Anicut (left and right bank), at present only 9 WUCS are formed. The reduction in number of WUCS is due to part of the command area developed into urban settlement, industries and no WUCS in the Left Bank Channel.

Table 5: WUCS formed under Gondhi Irrigation Subproject

No.	WUCS	River Bank	Area Irrigated*	MOU
1	Barandur	Right Bank	510.52	
2	Baballi	Right Bank	491.09	
3	Seegebagi	Right Bank	387.04	
4	Kage Kodumagi	Right Bank	324.73	MOU since 20-07-2002
5	Tallikatte	Right Bank	453.44	MOU since 09-09-2003
6	Hollehonnur	Right Bank	340.08	
7	Dasara Kallahalli	Right Bank	458.82	
8	Nagathi Belagallu	Right Bank	485.82	
9	Koppa- Doddakere	Right Bank	278.87	MOU since 03-05-2012

* *Source: Bhadra CADA, Shimoga*

During the implementation of KISWRMIP project, formation of one WUCS on Gondhi Left Bank Canal with its headquarters in Doddagopenahalli would be formed as per the rules formulated by CADA. The proposed WUCS in GLBC has Ayacut area 224 ha which is less than 250 ha and farmers of such channel express practical difficulties when combined with other WUCS of Bhadra Left Bank Canal. Thus, there could be small relaxation in the area under each WUCS (some cases less than 350 ha and in some above 500 ha). The effective methods and approaches will be adopted in formation of WUCS.

3.4.2 VNC Subproject

The stakeholder consultation was carried out during the PPTA which includes interaction with WUCS wherever formed and with farmers of VNC. The intensive interaction with the WUCS and

farmers of VNC carried out during field work, it was discovered that there exists 2 WUCS in VNC one each in Anegundi and Siruguppa Channel. Later, the cross verification of the records at CADA revealed that the WUCS formed under Anegundi Channel is in the ledger maintained by CADA. However, the WUCS formed in Siruguppa Channel is still not traced in the CADA files at Munirabad office.

One of the significant features of all the Channels studied shows that there is a potential to establish successful and sustainable WUCS. The focused group discussion in these channels, gathered large number of farmers who were primarily discussing issues like crop productivity, requirement of extension services, equitable distribution of water and enhancing net income.

During the focused group discussion with the farmers and the representatives of WUCS, there is interest to form into WUCS and engage in water management activities. The probable number of WUCS that may be formed under 16 VNC are 26 of which 2 already exists (Table 6).

Further, the area under each WUCS could vary from the standard size recommended by CADA (range of 350 – 500 ha), this is because, the social, economic and political complexities varies depending on the channels. In addition, there are channels with the Ayacut of less than 250 ha and farmers of such channel express practical difficulties when combined with other WUCS of other Projects. Thus, there could be small relaxation in the area under each WUCS (some cases less than 350 ha and in some above 500 ha).

Table 6: Probable WUCS under Vijayanagara Channel

No.	Name of the Channel	Area (ha)	Existing WUCS & Area (ha)	Probable No of WUCS
	Kamalapura Subdivision (Right Bank)			
1	Basavanna	1240.00		3
2	Raya	2226.00		5
3	Bella	600.00		1
4	Kalaghatta	237.00		1
5	Turtha	931.00		2
6	Ramasagara	673.00		1
7	Kampli	620.00		1
8	Belagondahala	210.00		1
	Vaddarahatti Subdivision (Left Bank)			
9	Anegundi	789.15	1(522.36)	2
10	Shivapur	403.48		1
11	Hulagi	265.07		1
12	Upper Gangavathi	774.53		2
13	Lower Gangavathi	666.91		1
	Siruguppa Subdivision (Right Bank)			
14	Siruguppa	764.00	1(764)	1
15	Deshnur	477.91		1
	Manvi Subdivision (Left Bank)			
16	Bichal	276.00		1
	Total	**11154.05**		**26**

3.4.3 TLBC Subproject

In Tungabhadra Irrigation Project which includes both right bank canal and left bank canal the total number of WUCS identified are 835 of which 655 WUCS are formed as on 31-12-2015 as shown in Table 7. The process of formation of WUCS started in the year 2000 and the detail break up of WUCS under TLBC and TRBC is yet to be arrived. The task of formation of WUCS was carried out by CADA and Water Resources Department. During the field visits it was found that the CADA fixed target every year to its staff to form the WUCS. The representatives of CADA based on the hydraulic particulars of the WUCS as prepared by WRD went to the respective villages and held one time meeting with the villagers and promoted the Participatory Irrigation Management through formation of WUCS.

Table 7: Progress on PIM since inception as of 31-12-2015 (CADA wise)

CADA	Tungabhadra Project (TLBC and TRBC)	
Area Irrigated	ha	363,000.00
Target	No. of WUCS	835
Registration	No. of WUCS	655
	Corresponding area	276,577.46
MOU	No. of WUCS	470
	Corresponding area	113,334.38
Handing Over	No. of WUCS	470
	Corresponding area	1133,34.38
Functioning	No. of WUCS	470
	Corresponding area	113,334.38
Grant in aid issued so far (Rs. lakh)	State share	409.03
	Central share	409.03
	Farmer's share	101.43

4 APPROACH AND METHODOLOGY FOR THE ASSIGNMENT

4.1 General Approach

In developing the methodology and approach for this project, SMEC has drawn its strong understanding and experience in integrated water resources management including feasibility studies, project implementation, capacity building, institutional strengthening in India and other parts of the world. SMEC has a long involvement in water resources sector and other related projects and provided services during different stages starting from project formulation to project construction and maintenance.

SMEC's experience suggests there are two critical factors governing competence to successfully manage projects to achieve their objectives - the ability to identify key issues and the capacity to address them on a timely basis. Under this project, this can only be done in conjunction with the KNNL and other relevant stakeholders, and by ensuring that the lines of communication remain open for frank and open discussion. SMEC will encourage formal and informal contacts, and professional and personal relationships between project staff and counterparts.

The approach and methodology adopted for the assignment will be geared towards the smooth execution of the scope of work specified in the TOR in systematic and sequential manner so that the use of man-power resources can be optimized and the project objectives can be achieved effectively. Special attention will also be given to those complex issues that may form constraints to the project, so that concerted efforts from various specialists and authorities are utilized to resolve them in the shortest possible time.

4.1.1 Project Management

Our project management approach will attach the highest importance to a solid and well-functioning, integrated team that will work smoothly with the staff of the KNNL, AC-IWRM, and other water-sector agencies. The selection of competent professionals, having requisite qualifications, experience and knowledge in similar type of projects has also been made. Various technical and administrative support staff will also be working to provide necessary support to the core team.

There are a number of activities, which are not directly related to the technical aspects of the services that are required in support of the technical services, and include the following: reporting, administration and logistics, personnel management etc. Using our proven management techniques we will be able to keep the project organised and controlled and we will:

- Field the professional staff in a timely manner.
- Manage support staff as necessary for the consultancy.
- Prepare reports and submit them on time to the KNNL for approval.
- Maintain the agreed time schedule for project progress and completion.
- Identify problems of the project and suggest solutions thereto.

SMEC will record all views, observations and comments of the Review Committee on the submitted deliverables and consider these as a guiding stick to enhance the project outputs. All views, comments and observations will be incorporated in the subsequent submissions.

4.1.2 Adhere to Local Laws and Policies

PSC will propose approaches to achieve these objectives which will be policy loyal as well as being technically and economically feasible. PSC will adhere to all applicable government policy and guidelines. The programs and plans will be consistent and well-conceived and would lead to the achievement of targets. An appropriate balance between water-sector development and social/environmental consequences will also be maintained.

4.1.3 Focus on Budget and Financial Performance

The focus of the IWRM plans will be on identification of the investment options based on the adequate level of cost recovery to ensure sustainability. Emphasis will also be given on an appropriate balance between capital and recurrent costs and in particular, there will be adequate provision for community mobilisation, training and empowerment, and transfer and institutionalisation procedures, tools and facilities for continued and sustainable post-project plan update applications.

4.1.4 Focus on Cross-Cutting Aspects

The sector strategies, plans and practices will be pro-poor and will take environmental sustainability and women's empowerment wherever possible taken into account ensuring that water allocation are not extracted beyond their allowed limits, that access to water is fair, that canal water sources are not contaminated and that the consumers receive good quality water. Necessary legal and institutional changes should be made at various levels for the purpose of sustainable water resources management, duly ensuring appropriate role for women.

4.1.5 Public Engagement

Where significant value judgements are made, there is a need to involve the public in the decision making process through public participation via a planned consultation process. Therefore, PSC team will consult with key stakeholders in all stages of the project. Consultation will generally be conducted both formal and informal ways like face to face discussions, meetings and workshops.

4.1.6 Focus on PMMS and Capacity Building of PIO, PMU and WUCS

Transfer of knowledge and on-the-job as well as structured training will be an integral part of the Project. Its objectives are to enhance technical skills and competence of project stakeholder to implement, update and monitor implementation of IWRM plans. On-the-job training underlies that transfer of knowledge is not a one-time affair. It is a process that should be carried out throughout the whole span of the assignment. Through hands-on-mentoring and joint working, our experts will pass their skills and knowledge to the devoted staff at various levels. Focus will also be given to in-country and overseas training and study tours for the relevant staff.

4.2 Technical Approach

4.2.1 WUCS Mobilisation and Awareness

The WUCS Institutional Strengthening Strategy will be carried out in four phases with specific tasks and stipulated time frame for each phase (Table 8). These four phase envisage capacity building of WUCS on various fronts like organisational building and engagement in planning, executing modernisation works and irrigation management.

Table 8: WUCS Institutional Strengthening Strategy

Phase 1 (8 Months)	Phase 2 (4 Months)	Phase 3 (18 Months)	Phase 4 (18 Months)
Mobilization	Modernization Planning	Executing Modernization Plan	Irrigation Management
		These two phases may overlap	
- Establishing and registering WUCS where they are not yet formed; - Creating awareness among farmers about the role and function of WUCS in irrigation service delivery including crop water planning, water management, minor and CAD system O&M, water charge collection and remittance; - Creating awareness among WUCS / members on program objectives and activities and their role in it; - Mobilizing non-member farmers to become members of their WUCS; - Training all WUCS office bearers on internal administration of WUCS as per Cooperative Societies Act; - Establishing WUCS Office, equipping WUCS with relevant information and records and updating their records to current status; - Discussing and signing of MOU between all WUCS and KNNL; and - Participatory bench marking of WUCS on its current level of functioning related to internal administration and irrigation management with its members.	- Preparation of WUCS CAD system improvement plan; and - Preparation of the WUCS agriculture development plan	- Implementation of the WUCS CAD system improvement plan; - Implementation of the WUCS agriculture development plan; and - Continued training of WUCS on various topics	- Handing over of minor canal and CAD system to WUCS - Preparation of minor canal and CAD system Asset Management Plan - Participatory bench marking of WUCS - Preparation and implementation of participatory WUCS action plan - Constitution of Water User Project Level Federation

4.2.1.1 Gondhi Subproject

The formation of efficient and sustainable WUCS needs to be undertaken with certain strategic approaches and method. It is worth mentioning here that the formation of WUCS on target oriented approach become rather impediment in the PIM. Thus, reviving the existing WUCS to the best standards need careful and meticulous approach. In Gondhi subproject, as mentioned above, the WUCS mobilisation and awareness campaigns will be carried out using extensive awareness materials on various aspects of irrigation management including modernisation of irrigation project on the principles of IWRM shall be prepared and distributed to water users and other stakeholders extensively in the workshops and meetings. The awareness materials prepared during the field preparatory activity under the assistance of Water Financing Partnership by Asian Development Bank will be revised according to the present status of the KISWRMP project. The awareness materials in Kannada language are approved by the Department of Water Resources, Government of Karnataka and include: Importance of Water, Modernisation, Role of Stakeholders in Irrigation Management, About Gondhi Sub Project, Integrated Water Resources Management (IWRM), Tungabhadra Sub Basin, Participatory Irrigation Management, Gender and Development and Benchmarking in Irrigation Project. One of sample awareness materials ready for use pending the PIO's approval is given in Figure 5.

In due course, based on the situational analysis, more such awareness materials including those mentioned in Appendix 6 of FAM and Appendix 4B-2 Output 2 – Implementation Plan: WUCS and Agriculture Development shall be prepared and used extensively. The different methods of awareness and mobilisation including open theatre, street plays, etc will be extensively used to make WUCS vibrant organisation.

ಇನ್ನೂ ಸಕ್ರಿಯವಾಗಿ ತೊಡಗಿಸಿಕೊಳ್ಳುವಂತೆ ಮಾಡುವುದರ ಮೂಲಕ ಸಂಪನ್ಮೂಲಗಳ ಸಮರ್ಪಕ ಬಳಕೆಯಾಗುವುದರ ಜೊತೆಗೆ ತಮ್ಮ ಜೀವನಾಧಾರ ಪದ್ಧತಿಗಳು ಸಹ ಉತ್ತಮವಾಗುವುದು.

ಮಹಿಳೆಯರು ಈ ಕೆಳಕಂಡ ರಂಗದಲ್ಲಿ ಆಸಕ್ತಿ ತೋರುವರು

ನೀ.ಬ.ಸ.ಸ.

- ನೀ.ಬ.ಸ.ಸಗಳ ಕಾರ್ಯಗಳು
- ನೀರಿನ ಬಿಡುಗಡೆ ಮತ್ತು ಪಾಳಿ
- ವಿಶ್ವಾಸಾರ್ಹ ನೀರಿನ ಸರಬರಾಜು
- ಕಾಲುವೆಗಳ ದುರಸ್ಥಿ

ಕಾಲುವೆ

- ಕಾಲುವೆ ನಿರ್ಮಾಣ ಮತ್ತು ದುರಸ್ಥಿ
- ಕಾಲುವೆ ಹೂಳು ತೆಗೆಯುವುದು
- ಕಾಲುವೆ ಲೈನಿಂಗ್

ಕೃಷಿ ಅಭಿವೃದ್ಧಿ

- ಬೀಜ ಶುದ್ಧೀಕರಣ
- ಬಿತ್ತನೆ ಹಾಗೂ ಸಸಿಮಡಿ ಅಭಿವೃದ್ಧಿ
- ನಾಟಿ, ಕಳೆ ತೆಗೆಯುವುದು, ಗೊಬ್ಬರ ಹಾಕುವುದು
- ನೀರು ಕಟ್ಟುವುದಕ್ಕೆ ಸಹಕರಿಸುವುದು ಮತ್ತು ಕಟಾವು
- ತರಕಾರಿ ಮತ್ತು ಹೂವಿನ ಬೆಳೆಗಳಲ್ಲಿ ಆಸಕ್ತಿ ವಹಿಸುವುದಕ್ಕೆ
- ಉತ್ತಮ ಸಮಗ್ರ ತೋಟಗಾರಿಕೆ ನಿಯೋಜಿಸುವುದಕ್ಕಾಗಿ

ಹೈನುಗಾರಿಕೆ

- ಕುರಿ ಮತ್ತು ಮೇಕೆ ಸಾಕಾಣಿಕೆ
- ಹಸು ಮತ್ತು ಎತ್ತುಗಳ ಸಾಕಾಣಿಕೆ
- ಕೋಳಿ, ಎರೆಹುಳು ಗೊಬ್ಬರ, ಸಾವಯವ ಗೊಬ್ಬರ ತಯಾರಿಕೆಗೆ

ಗೃಹ ಕೈಗಾರಿಕೆ

- ಕೃಷಿ ಉತ್ಪಾದನೆಗೆ ಮೌಲ್ಯ ಸೇರಿಸುವುದು (ಅಡಿಕೆ ಬೇಯಿಸುವುದು ಇತ್ಯಾದಿ)
- ಅಡಿಕೆ ಎಲೆಗಳಲ್ಲಿ ತಟ್ಟೆ ದೊನ್ನೆ ಇತ್ಯಾದಿಗಳನ್ನು ಮಾಡುವುದು
- ಊದುಬತ್ತಿ ತಯಾರಿಕೆ ಮತ್ತು ಬುಟ್ಟಿ ನೆಯುವುದು
- ಇತರೆ ಮಹಿಳಾ ಸ್ನೇಹಿ ಚಟುವಟಿಕೆಗಳನ್ನು ಗುರುತಿಸುವುದು

ಅಡ್ವಾನ್ಸ್‌ಡ್ ಸೆಂಟರ್ ಫಾರ್ ಇನ್‌ಟಿಗ್ರೇಟೆಡ್ ವಾಟರ್ ರಿಸೋರ್ಸ್ ಮ್ಯಾನೇಜ್‌ಮೆಂಟ್

ಮಹಿಳೆಯರು ಸಕ್ರಿಯವಾಗಿ ಪಾಲ್ಗೊಳ್ಳುವುದು ಹೇಗೆ?

ಮೇಲೆ ತಿಳಿಸಿದ ಹಾಗೆ ಮಹಿಳೆಯರನ್ನು ನೀರಾವರಿ ಅಭಿವೃದ್ಧಿಯಲ್ಲಿ ಸಕ್ರಿಯವಾಗಿ ಪಾಲ್ಗೊಳ್ಳುವಂತೆ ಮಾಡುವುದು ಕ.ಸ.ಸು.ಜ.ಸಂ.ನಿ ಉದ್ದೇಶಗಳಲ್ಲಿ ಒಂದಾಗಿರುತ್ತದೆ. ಅವರಿಗೆ ಹಲವಾರು ಕಾರ್ಯಕ್ರಮಗಳನ್ನು ಈ ಆಧುನೀಕರಣ ಯೋಜನೆಯಲ್ಲಿ ಹಮ್ಮಿಕೊಳ್ಳಲಾಗುವುದು ಅವುಗಳಲ್ಲಿ ಕೆಲವು ಈ ರೀತಿಯಾಗಿವೆ.

- ನೀ.ಬ.ಸ.ಸ.ದಲ್ಲಿ ಮಹಿಳೆಯರ ಸದಸ್ಯತ್ವ ಹೆಚ್ಚಿಸುವುದು
- ನೀ.ಬ.ಸ.ಸ ಆಡಳಿತ ಮಂಡಳಿಯಲ್ಲಿ ಕಡಿಮೆಯೆಂದರೂ ಶೇಕಡ 30 ರಷ್ಟು ಮಹಿಳೆಯರನ್ನು ಉತ್ತೇಜಿಸುವುದು
- ಕೃಷಿ ಮತ್ತು ಕೃಷಿ ಸಂಬಂಧಿತ ಚಟುವಟಿಕೆಗಳ ಬಗೆಗೆ ತರಬೇತಿ ನೀಡುವುದು
- ಗೃಹ ಕೈಗಾರಿಕೆ ಚಟುವಟಿಕೆಗಳು, ಅಡಿಕೆ ಬೇಯಿಸುವುದು, ಅಡಿಕೆ ಎಲೆಗಳಿಂದ ಇತರೆ ವಸ್ತುಗಳನ್ನು ತಯಾರು ಮಾಡುವುದು.
- ಗ್ರಾಮೀಣ ಪ್ರದೇಶದಲ್ಲಿ ಲಭ್ಯವಿರುವ ಇತರೆ ಜೀವನಾಧಾರ ಚಟುವಟಿಕೆಗಳು

ವಿಧಾನಗಳು

- ಮಹಿಳಾ ಸಮುದಾಯ ಸಂಘಟಕರನ್ನು ನೇಮಿಸುವುದು.
- ನೀರು, ನೀರಾವರಿ, ಕೃಷಿ ಮತ್ತು ಇತರ ಜೀವನಾಧಾರ ಬಗೆಗೆ ಅರಿವು ಮೂಡಿಸುವುದು ಹಾಗೂ ಉತ್ತೇಜಿಸುವುದು
- ಪ್ರಾರಂಭಿಕ ಹಂತದಲ್ಲಿ ಮಹಿಳೆಯರಿಗೆ ಪ್ರತ್ಯೇಕವಾದ ಸಭೆಗಳು
- ಮಹಿಳೆಯರಿಗೆ ಔಪಚಾರಿಕ ಮತ್ತು ಅನೌಪಚಾರಿಕ ತರಬೇತಿ, ಕಾರ್ಯಾಗಾರ ಮತ್ತು ಪ್ರವಾಸಗಳನ್ನು ಕೈಗೊಳ್ಳುವುದು.
- ಮಹಿಳೆಯರಿಗೆ ನೀ.ಬ.ಸ.ಸ. ಆಡಳಿತ ವಿಷಯಗಳ ಬಗೆಗೆ ವಿಶೇಷ ತರಬೇತಿ
- ನೀರಾವರಿ ಮತ್ತು ಕೃಷಿ ಸಂಬಂಧಿತ ವಿಷಯಗಳ ಬಗೆಗೆ ಮಹಿಳೆಯರಿಗೆ ವಿಶೇಷ ವಿಸ್ತರಣಾ ಸೇವೆಗಳು
- ಇತರೆ ಇಲಾಖೆ ಮತ್ತು ಸಂಘಗಳ ಜೊತೆಗಿನ ಸಮನ್ವಯದ ಬಗ್ಗೆ ಚರ್ಚೆ ಮಾಡಿ, ಮಹಿಳೆಯರಿಗೆ ಸಾಲ ಸೌಲಭ್ಯ ಒದಗಿಸುವುದನ್ನು ಮತ್ತು ಅರ್ಥಪೂರ್ಣವಾಗುವಂತೆ ಮಾಡುವುದು, ಮಹಿಳಾ ಸ್ನೇಹಿ ತಂತ್ರಜ್ಞಾನಗಳನ್ನು ಗುರುತಿಸುವುದು.

ಇದರಿಂದಾಗುವ ಲಾಭಗಳು

- ಸಾಮಾಜಿಕ ನ್ಯಾಯ, ಆರ್ಥಿಕ ಅಭಿವೃದ್ಧಿ ಹಾಗೂ ಜೀವನಾಧಾರ ಸುಧಾರಣೆ
- ಉತ್ಪಾದಕತೆಯಲ್ಲಿ ಹೆಚ್ಚಳ, ಸಂಪನ್ಮೂಲಗಳ ಸಕ್ರಿಯ ಹಾಗೂ ಸಮರ್ಪಕ ಬಳಕೆ
- ಆರೋಗ್ಯ, ವಿದ್ಯಾಭ್ಯಾಸ ಹಾಗೂ ಪರಿಸರ ಉತ್ತಮವಾಗುವುದು

ಅಡ್ವಾನ್ಸ್‌ಡ್ ಸೆಂಟರ್ ಫಾರ್ ಇನ್‌ಟಿಗ್ರೇಟೆಡ್ ವಾಟರ್ ರಿಸೋರ್ಸ್ ಮ್ಯಾನೇಜ್‌ಮೆಂಟ್

ಅರಿವು ಲೇಖನ ೫

ಕರಡು ಪ್ರತಿ

ನೀರಾವರಿ ಅಭಿವೃದ್ಧಿಯಲ್ಲಿ ಮಹಿಳೆಯರ ಪಾತ್ರ

ADB

ನೆರವು
ಕರ್ನಾಟಕ ಸರ್ಕಾರ
ಮತ್ತು
ಏಷಿಯನ್ ಡೆವಲಪ್‌ಮೆಂಟ್ ಬ್ಯಾಂಕ್

ಅಡ್ವಾನ್ಸ್‌ಡ್ ಸೆಂಟರ್ ಫಾರ್ ಇನ್‌ಟಿಗ್ರೇಟೆಡ್
ವಾಟರ್ ರಿಸೋರ್ಸ್ ಮ್ಯಾನೇಜ್‌ಮೆಂಟ್

Figure 5: WUCS outreach materials

4.2.1.2 VNC Subproject

As mentioned earlier, there is a potential of 26 WUCS of which 2 WUCS are formed. Prior to creation of WUCS, an intensive awareness and mobilisation would be carried out in the VNC channels where WUCS are to be formed. The farmers in the VNC would be engaged in area delineation and list of Ayacutdars for each WUCS. In addition, the findings of the feasibility study will be the basis for preparing sub project specific awareness materials and campaigns. In addition, as mentioned in Appendix 6 of FAM and Appendix 4B-2 Output 2 – Implementation Plan: WUCS and Agriculture Development shall be prepared and used extensively. The efficient governance of WUCS depends on in-depth exercise of mobilisation.

4.2.1.3 TLBC Subproject

A review of awareness materials and campaigns adopted in TLBC will be conducted and efficient awareness shall be carried in identified command area under KISWRMIP. The effective mobilisation enable transparency and participation in WUCS organisation. All aspects of irrigation management will be given equal impetus in development of WUCS. An exclusive attempt will be made to mobilise women farmers to become the members of WUCS.

4.2.2 Capacity Building

4.2.2.1 Rationale

The principal aim of the capacity building under the KISWRMIP is to make the KNNL, CADA and WUCS a good irrigation service provider at their level. Where the KNNL manages the off-farm canal infrastructures, the CADA with WUCS is expected to manage the on-farm canal infrastructures i.e. tertiary and downstream infrastructures. There are four attributes of a good irrigation service delivery; accordingly, the service delivery should be:

1. Reliable
2. Equitable
3. Adequate, and
4. Flexible

Malano and van Hofwegen (Management of Irrigation and Drainage Systems, 1999) propose the following definitions for service quality in irrigation and drainage as described in Table 9.

Table 9: Attributes of a good quality irrigation and drainage service

Service Quality	Irrigation	Drainage
Adequacy	Ability to meet water demand for optimum plant growth	Ability to dispose excess water in minimal time to prevent damage
Reliability	Confidence in supply of water	Confidence in ability to dispose excess water
Equity	Fair distribution of share of water shortage risks	Fair distribution of inundation risks

Service Quality	Irrigation	Drainage
Flexibility	Ability to choose the frequency, rate and duration of supply	Ability to choose the time, rate and duration of disposal

From IWRM point of view, there are two more attributes of a good quality irrigation and drainage service. Such services should also be:

1. Efficient, and
2. Sustainable

Where efficiency signifies that the adequate water should be delivered to the users with minimum loss possible, sustainability implies that the system should provide the intended service through the expected project life.

In this way, a good irrigation and drainage service should ideally be **reliable, equitable, adequate, flexible, efficient and sustainable**. In order to achieve these attributes, the irrigation systems should be **robust and flexible**, whereas the service management should be **capable**, **proactive and innovative**.

Where the modernisation of selected subprojects is expected to provide adequate robustness and flexibility to these systems, the capacity building of the relevant service agencies such as KNNL, CADA and WUCS is expected to complement the management with necessary resources, skills and expertise. In addition, Institutes engaged in training program like Water and Land Management Institute (WALMI), Dharwad, Karnataka Engineers Research Station (KERS) Mysore, Regional Institute Cooperatives Management (RICM) Bangalore and District Agriculture Training Centre (DATC), Krishi Vigyan Kendras (KVKs) shall also be equipped to carry out capacity building activities for different stakeholders.

The Consultant's approach for capacity building (Figure 6) will focus firstly on the adequacy of human resources (staffing) against the organisational workload in these organisations at different operation levels, for example, KNNL at Head Office and Field Offices, and secondly on the adequacy of skills and expertise in these resources.

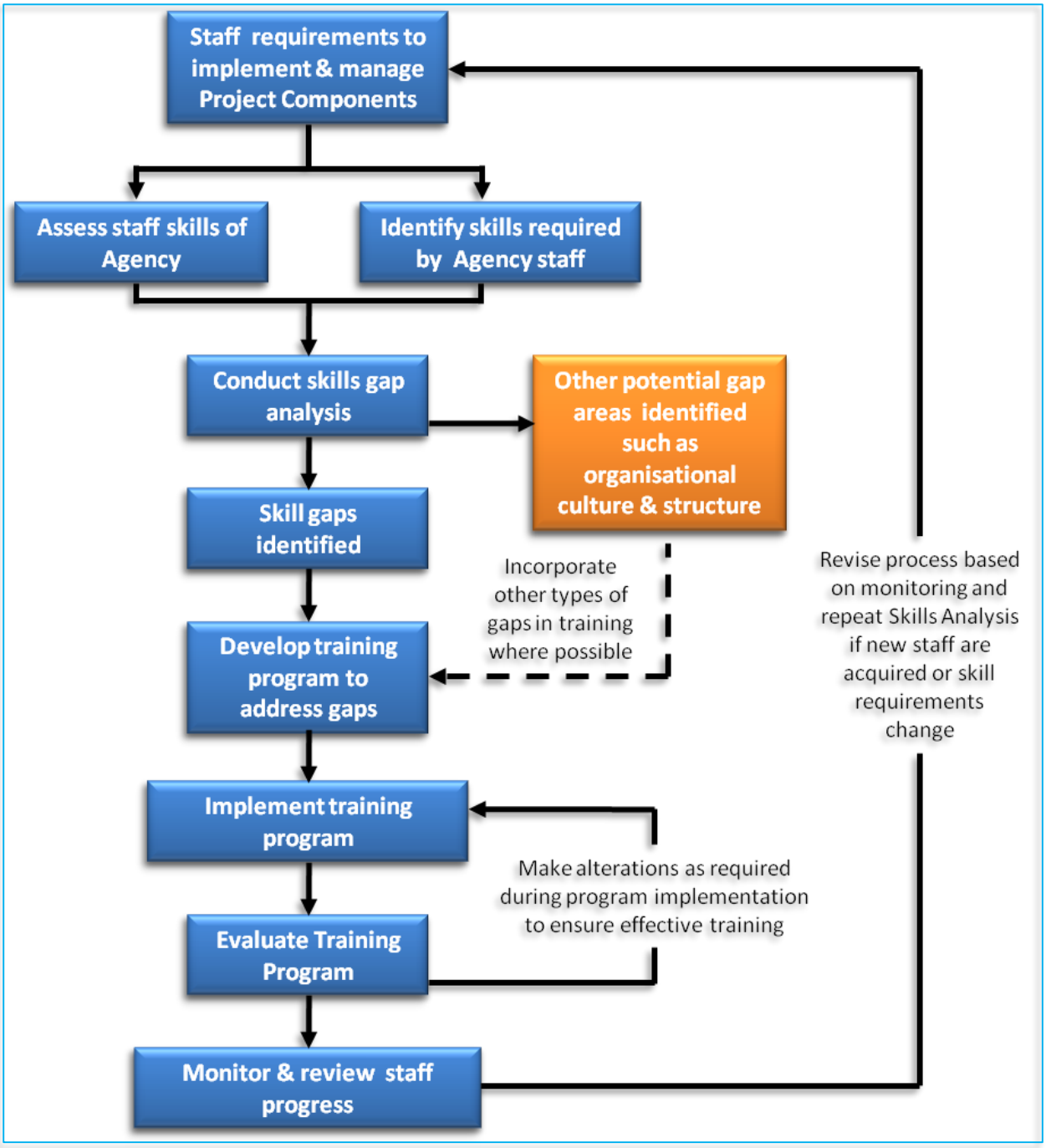


Figure 6: PSC's capacity building process

4.2.2.2 Training Needs Assessment (TNA)

Training Needs Assessment will include:

- Review of organisational roles and responsibilities, and staffing and their position descriptions;
- Assessment of skills and expertise of the staff through Focus Group Discussions, implementation of structured questionnaire and interviews with the relevant staff;
- Analysis of collected information to identify the skill gaps and training needs; and
- Identify the potential training provides (i.e. training resources) such as individual specialists, public and private training institutes such as WALMI, KERS, DATC, FAO,

ICRISAT etc, consulting firms, NGOs/INGOs, government departments such as Agriculture Department, etc.

After identifying training needs for different organisations, the Consultant will prepare the training modules clearly outlining (Table 10):

- Name of Module
- Objectives
- Content
- Duration
- Target Groups
- Potential Training Providers

4.2.2.3 Classification of Training Needs

To assist in understanding the nature of particular training activities, the training modules have been classified as one of three types:

1. Core Knowledge
2. Management Knowledge and Skills, and
3. Specialised Knowledge and Skills

Core Training Modules

Core training modules contain what is considered to be the core information and knowledge that staff of water-related organisations will require to assist them in their roles in their respective organisations. Not all core modules discussed in this report are appropriate to all organisations.

Management Training Modules

To assist in the development of modern approaches to management within bodies and organisations in the water sector, it is desirable that managers and other selected staff are exposed to modern concepts of management and business planning processes. This will involve the delivery of management training to senior leaders, unit heads and others who are possibly seen as potential future leaders.

Obviously, the content and depth of treatment of each module needs to be appropriate to the target group. While it is considered that executive staff of WUCSs would benefit from training in management and leadership, training for this group would not take the same form as for managerial staff from KNNL or CADA.

Specialised Training Modules

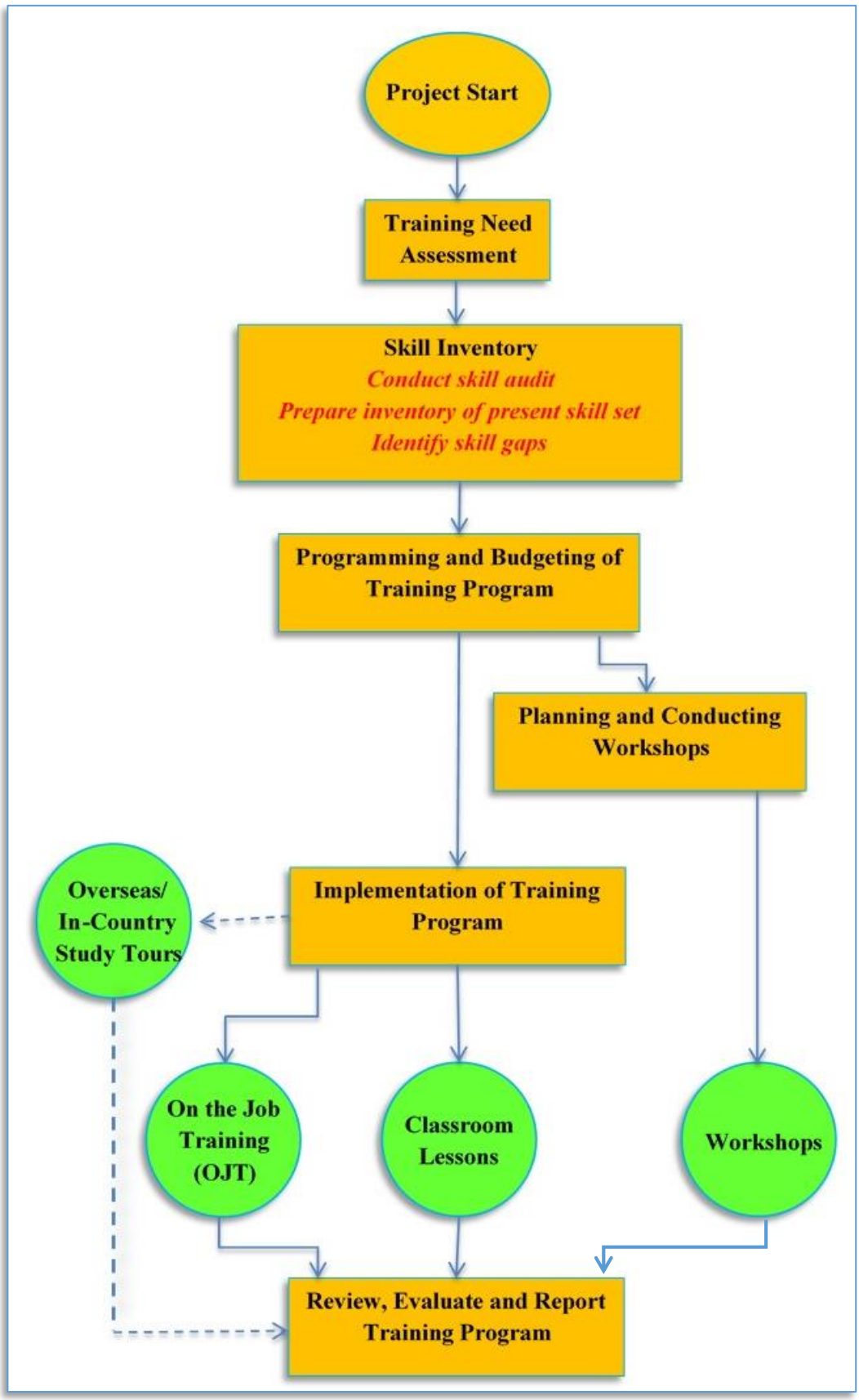
Specialised training modules are also required that cover specific requirements of divisions or groups of staff in particular organisations with the same training requirements e.g. the design of the pressurised irrigation systems, etc.

Table 10: A typical training module

Module Number:	**C5**
Name:	Customer Service
Objectives:	At the end of this module, participants should be able to: · Describe how Irrigation Service Fees will likely become an ever-increasing part of DWR's MOM budget · Explain the importance of viewing water users as customers · Describe the main determinants of water users' willingness to pay · Define what good service is · Explain the benefits of improved service · Plan for improved service delivery · Manage water resources in a customer-oriented way · Evaluate and report on customer service
Content:	The following topics will be covered: · The water user as customer · The difference between customer ability to pay and willingness to pay · Customer expectations and customer satisfaction · Creating customer focus and customer value · Service delivery and the importance of good customer service · The benefits of satisfied customers · Defining excellent service · Managing customer relationships · The importance of being responsive to customer needs · Identifying customers' requirements · The importance of reliability, adequacy and timeliness to water users · Methods of collecting customer information · Customer service improvement plans · Measuring service performance · Recognizing success · Aligning service to organisational goals
Duration:	1 day
Target Groups:	KNNL Field Offices, CADA, WUCS
Training Provider:	???

4.2.2.4 Training Methods

In consultation with KNNL, CADA and WUCSs, these training modules will be ranked depending on the nature, urgency and training delivery modality and a phased time-based training implementation plan will be prepared. These trainings will be conducted in any of the following



modes (Figure 7):

- On-the-Job Training (OJT)
- Formal Classroom Sessions

- Workshops, and
- Study Tours

On-the-Job Training

Training and capacity building activities will not be restricted to formal classroom-based training but will also place great emphasis on on-the-job learning employing Action Learning principles. All on-the-job training activity will include, wherever possible, a review step for trainees to allow them to reflect upon their progress, and to discuss their progress and seek clarifications on issues as required from the relevant specialist. This will be critical in important activities such as in the preparation of the Feasibility Studies of VNC and TLBC in which the Consultant will take the lead.

Formal Classroom Sessions

The formal classroom sessions will include the short sessions in the workshop environment and could be a day or a week long at the project sites whereas long sessions will include the weeks or months long sessions in training institutes or universities and may include post-graduate diploma or degree courses.

Workshops

The one-day workshops will be organised on as-required basis at the project sites or PMU offices, where the Consultant experts will discuss the relevant studies, researches and technological innovations in the areas of expertise including lessons learnt during the project implementation, and elicit the stakeholder's feedbacks, critical comments and suggestions.

Study Tours

Both in-country and overseas study tours will be conducted with the participants ranging from WUCS members to high level KNNL officers observe first-hand how other states or organisation or countries manage their irrigation systems. There are several success stories of PIM implementation in other states, and could be relevant for WUCS, CADA and PIO staff.

In a similar manner, subject there are several success stories of irrigation management in Australia such as Murray Darling Basin Authority and Murray Irrigation (Plate 7), where subject to funding availability under the KISWRMIP, higher level KNNL officers may visit to observe first-hand some of best practices of irrigation service delivery and other management aspects.

Plate 7: Irrigation and agriculture practices in Murray Irrigation in Murray Darling Basin, Australia

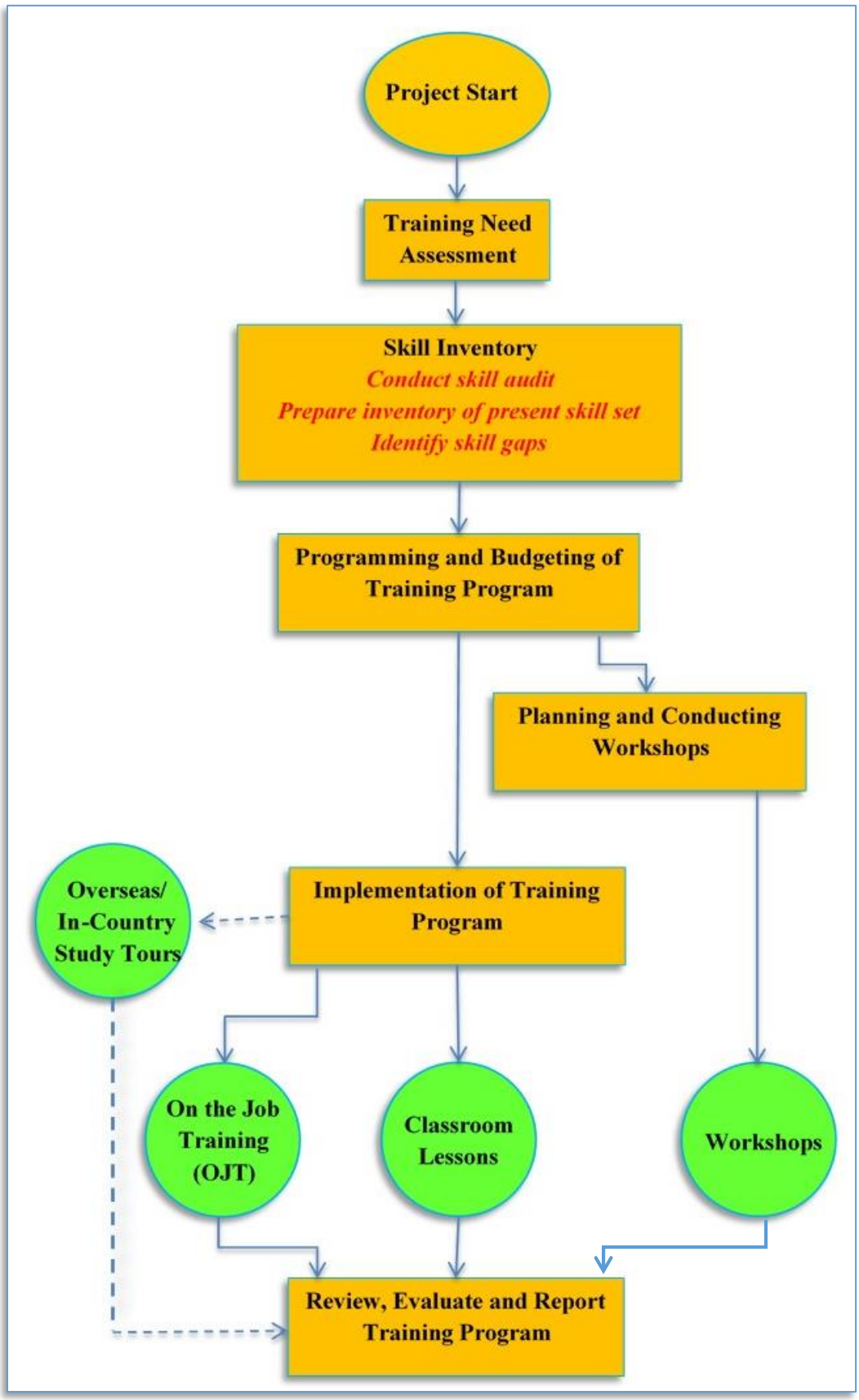


Figure 7: SMEC's capacity building methods

4.2.2.5 Training Implementation Plan Development

A comprehensive training implementation plan will be prepared including the cost estimate, spanning over the time period beyond the completion of the KISWRMIP. The costs will be estimated based on the costs of similar training plans conducted recently by KNNL, CADA and AC-IWRM offices, and certainly the prevailing market prices of logistics.

The capacity of the WALMI as the potential training provider will also be assessed, and if required, the capacity building of WALMI will also be suggested.

4.2.2.6 Partnership with Relevant Global Institutions in India

The global institutions such as FAO and ICRISAT have several ongoing programs focused on improvement in irrigation and agriculture practices in India. The PSC will coordinate with these institutions and arrange to forge a long-term partnership with KNNL for the capacity building required for implementation of similar programs in the selected subproject command areas.

4.2.2.7 WUCS Capacity Building

Preparation of training modules, materials and methods and approaches will be taken up based on the needs of the field situation. There shall be trainings at village, sub project and state level using simple techniques and refining the existing materials at training institutes like RICM, WALMI and other district level agencies like DATC, etc. The participatory training program shall be drawn up extensively to develop qualitative WUCS organisation emphasising on various topics like WUCS organisation, crop water management, volumetric supply, indenting for water, Demand, Collection and Balance (water charge collection and water rate remittance) and regular Operation and Maintenance. With regard to agriculture and agri based development activities detailed methods and approaches including farmers field schools, on farm demonstration, etc shall be used. In addition, study tour to successful WUCS at State, National and International Level shall be taken up.

4.2.3 Social and Environmental Safeguards

The Safeguard Policy Statement describes common objectives of ADB's safeguards, lays out policy principles, and outlines the delivery process for ADB's safeguard policy. The Safeguard Policy Statement (SPS) builds upon the three previous safeguard policies on the environment, involuntary resettlement and indigenous peoples, and brings them into one single policy that enhances consistency and coherence, and more comprehensively addresses environmental and social impacts and risks. The SPS aims to promote sustainability of project outcomes by protecting the environment and people from projects' potential adverse impacts by avoiding adverse impacts of projects on the environment and affected people, where possible; minimizing, mitigating, and/or compensating for adverse project impacts on the environment and affected people when avoidance is not possible; and helping borrowers/clients to strengthen their safeguard systems and develop the capacity to manage environmental and social risks.

4.2.3.1 Social Safeguards

Two major tasks for PSC in this regards are:

1. Prepare the Social Management Framework and Gender Action Plan for the Tranche 2 sub-projects
2. Support and monitor the implementation of the Social Management Framework and Gender Action Plan for the Tranche 2 sub-projects, prepared during PPTA

In this regard, Gondhi subproject has an implementation concept and structure which incorporates all physical and non-physical components but needs to be develop a feasible and

pragmatic operational methodology and implementation strategy for community based activities. In order to address this the functioning and capability of existing community institutions such as WUCS, WUAs, SHGs, VFGs etc have to be examined and identify the gaps for making these institutions vibrant for facilitating the implementation.

Effective and reasonably comprehensive community participation is the primary deciding factor for the success and operational sustainability of IWRM. Experience over recent years demonstrates that communities are willing to pay for improved water services which they find acceptable. Community involvement always depends upon the level of awareness within the community. It is a formidable task to bring about positive change in people's behaviour and practice with regard to water use, environmental conditions and related issues. A word of caution over emphasis on community contribution, particularly monetary, typically has a negative influence on the quality of community participation dynamics. The active participatory involvement of beneficiaries does indeed slow down physical implementation, but experience shows that this is only in the beginning.

Consultation with local farmers/community is a necessary prerequisite to get their cooperation and endorsement for IWRM projects. Here WUCS or other grass-root level institutions play a pivotal role.

In general, the IWRM is conceived as an integrated project, in reality, the role of the community in the planning and management of the proposed water distribution in villages are rather limited. The experience, views and perceptions of farmers and other communities are usually not been adequately sought or considered other than in a recent review in few selected areas. For the sustainability of systems, it is considered important that WUCS be involved in the identification (and design) of solutions and play a key role in the operation and maintenance of facilities constructed.

In the inception phase it is of paramount importance to analyse the present situation, review of reports and consultation with various stakeholders and understand the poverty dimensions and training activities outlined in various documents. Consultation meetings will be organized with WUCS and other grass root level functionaries. This will enable to understand the activities especially for addressing the poverty reduction and gender dimensions and work with Agricultural specialist, WIS, Communication specialist and plan appropriate training activities based on the local requirement.

For planning training activities on poverty reduction and gender inclusiveness there is a need to explore the local culture, diversity and the environment. It is a fact that in farming women plays a predominant role in our country, despite the challenges and limitations. They are the ones who are making the farming sector move.

The irrigation improvements proposed in the project should be available to all members of the villages and especially poor families. To achieve this, several basic concepts need to be incorporated with the most significant being:

- ***user-friendly*** construction and operation and maintenance;
- ***affordability*** for both the user and the project, while being technically functional and socially acceptable to users;
- ***sustainability*** for long term function and use;
- ***replication*** potential for other locations to adopt without external assistance.

These conceptual objectives need to be coupled integrally to environmental and social conditions. The latter involves:

- ***existing community practice*** - develop improvements from the basis of existing practical community experience;
- ***active community participation*** - involve functional and representative village community organisation and community acceptance of the activities/project through participatory procedures, community management of implementation and acceptance of ongoing responsibility for installed facilities;
- ***integrated and strategic implementation*** - to be achieved through solution design and concurrent selective implementation of components, coupled to targeted motivation and training;
- ***involvement of women*** - optimise their contribution and influence, especially in the local environment;
- ***involvement of youth and other disadvantaged groups –*** optimum use of young generation in the programme for influencing the decision making process at family level and at community level in the long run.

Partnership

Building partnerships is the most challenging aspect of community development programmes. For integrated sector programmes, some key partnership features include:

- partnership between community, WUCS/Local Government and implementing agency;
- fully active community participation both within communities and between each community and the project;
- well defined commitments and inputs for each partner organisation;
- integration of key project components;
- flexible choice and development of service levels by all partners;
- felt needs of communities identified through PRA;
- PRA findings of each community to be used appropriately in community planning and implementation;
- members and staff of all partner organisations to be given training on community organisation, community management, team building, monitoring etc..;
- WUCS members to be given intensive training on team building, group dynamics, community organisation and management, improved agricultural practices, basic financial management and monitoring;
- for all partners, a necessary sense of responsibility for the project is to be created/developed, with particular focus on communities residing in the locality;
- sharing of knowledge and skills between partners including cross visits between partners;
- joint partnership decisions;
- community needs to be involved in progress and performance monitoring (functionality monitoring) of implementation and subsequent on-going activities;

Without effective partnership, one of the project partners is likely to dominate implementation with unilateral decisions made that may or may not be advised to other partners. This results in the decision making party frequently being seen to own (be responsible for) the project with either indifference or animosity on the part of the less involved partners. Experience shows this situation

typically carries beyond implementation into the following operation and maintenance phase to the functional detriment of project service(s) and/or facilities provided.

Training for Community Participation and Management

A training needs assessment for community participation and management has to be carried out for all project partners during the planning stage to identify and arrange for orientation and training requirements. For this assessment, project partners will in general fall into five groups:

1 ***Project Planners and Managers*** involving senior administrators and elected representatives associated with the project - they need to be given appropriate orientation to enable them to get a clearer vision of project objectives and requirements and the challenges of implementing community based projects. This is particularly important.

   The common misconception that senior administrators and community representatives know community situations better than those working closer to and with village communities needs to be avoided. Only by working at Command Area/village level can variations between communities, their differing perceptions of need, the physical circumstances of villages and the experiences of village communities be taken into consideration. This flexibility and capacity to respond to village differences is important to the potential success and sustainability of project interventions.

2 ***Project Facilitation Staff*** - all management and implementation staff need to have an acceptable understanding of Community organization and community management in relation to the project and receive specific training for their areas of responsibility directly involved with Community Participation Management (CPM) and gender dimension activity. This prepares them for both roles of implementation management and the training of other project partners.

3 ***Beneficiaries and Community*** - household members, WUCS, SHG members and CADA/village workers all need general project orientation and together with training for their specific areas of CPM responsibility. The latter applies particularly to WUCS committee members and CADA/village level workers.

4 ***Local Support Personnel*** - involved departmental functionaries from agriculture, rural development, women and child development, Panchayat members and functionaries and NGOs, all need general project orientation and specific CPM training for their support to the effective implementation of the activities envisaged and the subsequent operation and maintenance of facilities.

5 ***Contracted Organisations*** - consultants, contractors and other specialists all require initial basic orientation about the project with orientation and training in Community Participation and gender relating to their specific implementation and management responsibilities. The benefits of effective interaction with communities about issues of quality control, implementation planning and performance and expenditure are of particular relevance.

Empowerment

Empowerment means vesting the people with knowledge and skills to make needed changes. This provides people with the ability to act individually and collectively.

Information, Education and Communication (IEC) are important parts of an IWRM programme. The significance and approach of IEC for WUCS, communities and other project partners are that they be fully informed about the project and be prepared for their respective roles. To ensure this, the role and responsibilities of project partners/facilitators need to be identified in respect of resources to be mobilised, action plans to be prepared, the implementation strategy to be used, monitoring required and operation, maintenance and payments to follow.

To support this information requirement, a clear and suitably detailed implementation methodology and strategy will be developed and incorporated in the planning and implementation stage. Specific IEC sessions are required for each stage to ensure a continuity of information flow. This must be flexible and must adapt to the willingness, commitment and interest of people associated with the programme. It is also advisable that project strategies and requirements be adapted to the circumstances and needs of command area/village, rather than automatically following a stereo-type IEC approach for all villages.

Planning and management for Community Participation Training requires suitable resource persons to be identified. It is advisable to do this under two main categories: (a) training of trainers (mostly government functionaries, the staff of NGOs and other support organisations and selected social workers from the community) and (b) training those directly and indirectly benefiting from the programme including local community representatives. Training is an integral part of Information Education and Communication (IEC) with both occurring concurrently.

Additional to appropriate formal training for project partners, it is important to assess the need for and provide refresher training for all partners. Similarly, post-training evaluation is necessary to determine the effectiveness of training and as necessary, adapt the training programme.

Gender Strategy

The philosophical basis for considering gender issues is a quest for equity. In traditional societies, decisions are usually made by men. Often, women are expected to be subservient, although they may be able to exert indirect influence within the household or at an Institutional level.

IWRM and agricultural practices are particularly concerned with gender issues because women are the ones predominantly involved. If the views and concerns of community women are not expressed and integrated into programme and facility designs, it is unlikely that it will earn their commitment and the probability of functional failure will be high. Experience shows that when women actively incorporate changes into the pattern of their daily lives, they pass these changes on to other family members, thus increasing the sustainability of the programme. To achieve this, the active support (and involvement) of community men needs to be sought.

Gender mainstreaming is a strategy for making women's as well as men's concerns and experiences an integral dimension of the design, implementation, monitoring, operation & maintenance, including policies and programmes in all political, economic and societal spheres, so that women and men can benefit equally and inequality is not perpetuated.

In this project during the implementation, three strategies are proposed to be developed:

1. Identify women leaders and train them to carry out specific tasks that may be socially accepted;
2. Gradually build-up a network of women leaders and train them to voice their concerns in day to day implementation;
3. Propose and design information dissemination methods that can be easily delivered to women.

The primary focus of the training is on IEC (Information Education and Communication). The self-help groups existing in the project area provide an excellent platform to involve women both as recipients of services and service providers. In other experiences it has been found that women's groups function much better if they can be offered a combined package of functional literacy, livelihood, agriculture and a nutrition programme package. The strategy will include:

- Providing women with full information on the project organization, role and responsibilities various stakeholders, role of WUCS, and WUCS functions;

- Encouraging and training women to become leaders or representatives of the WUCS;
- Discussing with women groups their interests and incorporating their needs in concrete action plans;
- Raising the awareness of CADA and other government officials and extension engineers towards incorporating women's and small farmers' views into increasing the efficiency of the irrigation system; and
- Evaluating the impact of women's involvement on the efficiency of the system.

Due to the vital importance of involving women in the water resources sector, a separate activity named "Enable Women leaders to fully participate in IWRM activities" will have to be initiated; several indicators were developed along with it in a way to measure its impact on the results. Following monitoring mechanism can be introduced for measuring the satisfactory levels:

- Ratio of women to men in farming households at tail-end villages stating that water availability has improved
- Percentage of female head households indicating that they have benefited equally from improved water availability
- Percentage of female farmers reporting higher yields
- Ratio of female to male farmers indicating that rehabilitation works are in accordance with their priorities
- Percentage of women participating in Executive Council of WUCS and general meetings
- Percentage of women actively involved in farming indicating that the KNNL, CADA Irrigation Engineers have discussed matters related to crop and irrigation management with them
- Percentage of households in a village indicating that there is less garbage thrown in the secondary canals
- Increase in number of women leaders per village/pilot area who received training by the end of every year.

Monitoring and Review

Monitoring and review of the programme and its components has to be an integral part of planning and implementation. The learning from this could be used for preparing future proposals. The main objective of monitoring and review are to find:

- Whether the implementation of various components is progressing as planned.
- Whether they are producing the expected result.
- If not, what problems are being encountered in implementation?
- What steps can be taken to overcome them.
- Taking adequate measures to implement these steps.

Monitoring has to be done individually and collectively. Collective monitoring will be done by respective WUCS committees. Since the activity plan specifies responsibility for each individual, he/ she should periodically ask himself/herself how he/she will discharge responsibilities. Monitoring & reviewing should not be a fault finding exercise. On the other hand, emphasis should be on doing or can do better next time. Based on monitoring & review, activity plan can be modified to the extent needed.

In addition to monitoring and review, the programme has to be evaluated on sample survey basis at least once a year. The evaluation will deal with not only the immediate objectives, but also with intermediate and ultimate objectives. It will also evaluate the inputs, and processing of inputs.

Based on the concepts, strategies and approaches outlined above, a multi-disciplinary team involving PIM, Communication and Environmental specialists will undertake visits to Tranche-2 areas, and develop social management framework and gender action plan suitable to the locality.

4.2.3.2 Environmental Safeguards

Two major tasks for PSC in this regards are:

1. Prepare the Initial Environmental Evaluation (IEE)/Environmental Impact Assessment (EIA), whichever is required, for the Tranche-2 subprojects i.e. VNC and TLBC based on Environmental Assessment Review Framework (EARF) prepared during PPTA; and
2. Support and monitor the implementation of the environmental safeguards during the implementation of Gondhi modernisation works.

The EARF provides the guidelines for conducting the environment-related actions for the overall project. Additionally, it also identifies a list of activities which should be carried out during design / detailed planning, construction and operation and maintenance in order to minimize the environmental impact. Most importantly, it identifies the compliance requirements of the Central and State Government Agencies and implementation of the ADB environmental safeguards.

The IEE for the Gondhi Anicut provides an assessment of the compliance requirements and environmental impacts of the modernization of the irrigation schemes carried out on the Gondhi Anicut and the Bhadra Canal System. The compliance requirements arise because of the location of the project. The Gondhi Anicut Modernization Project is located in proximity to the Bhadra Wildlife Sanctuary (within 10km from the sanctuary) and critically polluted area (i.e., within 10km of the polluted zone of the Bhadra River) which would necessitate the project to procure clearance from the Ministry of Environment, Forests and Climate Change as a Category B Project. Secondly, during the construction phase a number of impacts have been identified arising from clearance of vegetation for site access, procurement activities, transportation of material and labour, construction waste disposal, sanitation and hygiene practices in labour camps. The IEE also highlights the project impact on the noise levels, discharge of wastewaters into water bodies and effect on air quality levels during construction. Additionally, the IEE warns of increased use of fertilizers and pesticides in the region because of agricultural interventions and intensification that can result in toxic releases to the environment.

Relevant activities include:

- Support monitoring the environmental impacts of the Tranche-1 project i.e., Gondhi Anicut and the Bhadra Canal Subproject;
- Follow the EARF prepared during the PPTA, the environmental laws and regulations of the GoI and the SGoK and the ADB's Safeguard Policy Statement (2009) and assist the KNNL to arrange and organize collected information and to undertake IEE or EIA as necessary for Tranche-2 subprojects viz., Vijayanagara Canal System and Tungabhadra Left Bank Canal System;
- Assist the KNNL in identifying environmental management and monitoring actions to mitigate negative impacts and identify their corresponding costs, for inclusion in the IEE / EIA for Tranche 2 sub-projects viz., Vijayanagara Canal System and Tungabhadra Left Bank Canal System;

- Assist the KNNL in monitoring the implementation of environmental management and monitoring plans for Tranche-2 subprojects viz., Vijayanagara Canal System and Tungabhadra Left Bank Canal System.

The deliverables to be provided on the environmental issues are in line with the main deliverables prepared for the project. These include the Inception Report, Feasibility Report for Tranche-2 Subprojects, Quarterly Progress Report, Annual Progress Report, Mid-Term Report and Project Completion Reports.

The identified tasks and the deliverables seem to be adequate for the project requirements. The details activities that shall be performed for each of the sub-projects shall include the following:

No.	Sub-Project	Activities
1	Gondhi Subproject	- Review of IEE for Gondhi Subproject and address any short-falls in the IEE; - Conduct a Field Visit; - Review Contract Clauses so that there is no conflict on the EMP Implementation; - Consult with Bio-Diversity Board to identify any biodiversity sensitive areas near the Gondhi Subproject and suggest appropriate actions to minimize impact; - Identify sites for disposing construction wastes; - Check the Contractor's EMP and address any short-falls; - Check on Tree-Felling Plan and ensure Compensatory Afforestation is implemented; - During Construction ensure monitoring of noise levels, wastewater discharges and air quality near the construction areas; - Arrive at an agreement with the local farmers on utilising their land for disposing approximately 213,000 cubic m of material excavated from the canal; - Monitor EMP Implementation.
2	Vijayanagara Canal Subproject	- Conduct a Field Visit; - Consult with Bio-Diversity Board and other Agencies to identify environmentally sensitive issues areas near the Vijayanagara Canal Subproject and suggest appropriate actions to minimize impact; - Consult with Hampi World Heritage Management Authority (HWHMA) on the procedural aspects of canal work approvals. - Prepare IEE for Vijayanagara Canal Subproject;
3	Tungabhadra Left Bank Canal Subproject	- Conduct a Field Visit; - Consult with Bio-Diversity Board and other Agencies to identify environmentally sensitive issues areas near the Tungabhadra Left Bank Canal Subproject and suggest appropriate actions to minimize impact; - Prepare IEE for Tungabhadra Left Bank Canal Subproject;
4	General	- Training and Capacity Building as required;

4.2.4 Agriculture Development

4.2.4.1 Rationale

KISWRMIP aims to improve the overall agriculture productivity and water-use efficiency at the field level. At the 1st Tranche it will focus on an area of about 4000 to 5000 ha where improvements in irrigation water availability and timely support to Water Users Cooperative Societies targeted at an area of 350 to 500 ha and will be integrated with improved agriculture and on-farm water management practices. The project will use a specifically developed Farmer Field School (FFS) approach targeted at an area of 40 to 50 ha having a group of 20 – 30 farmers as a mechanism to introduce improved agronomic and water management practices, and also to develop the institutional capacity of the WUCSs for water management and operation and maintenance.

4.2.4.2 Existing Status

Agriculture

- Paddy is the main seasonal crop in both Rabi and Kharif and sugar cane and arecanut are the perennial crops. Kharif season cropping makes use of irrigation as well as monsoon rainfall, while Rabi season cropping, though assisted by rainfall, makes use of residual soil moisture following Kharif and is otherwise dependent on irrigation.
- Pumped water, mostly from the river is utilized for conjunctive use by farmers in the middle and tail reaches particularly during closure (1 month in late November and December), and in the lower part of the system (below km 44 on the right bank canal) during the closure of Bhadra canal in May to July. Water may be pumped several kilometres from the river. There are small areas of drip irrigation for arecanut. The area served by pumped water is not known, but may be 20% to 30% of the crop area.
- According to Gondhi Feasibility Report prepared during PPTA, the use of fertilizer in Gondhi scheme is considerably higher than the state average, and said to be twice recommended rates. The status of soil testing and the nutrient status is not known. The use of organic manure and farm yard manure is low. Micro nutrient deficiencies are increasing. The application of pesticide has also become common. Farm labor costs are increasing, and farmers are increasingly adopting mechanized agriculture, especially tractor ploughing, weed control, and transport, seed planting, and contract combine harvesters.
- According to Gondhi Feasibility Report prepared during PPTA, it is reported that 75% of the gross command area was cropped and the rest is built up and farmstead areas, river, roads, non-crop trees, land out of command, and open water; 37% of the cropped area was under seasonal crops, 49% tree crops and 12% under sugarcane. According to the household survey cropping intensity in the area is 131% overall and about 160% on land with no perennial crops. The cropping pattern is dominated by paddy with around 40% of the area in both Kharif and Rabi seasons. The Gondhi is fully developed, with almost 100% cropping in both Kharif and Rabi seasons. There is potential to improve yields in the Gondhi area through improved crop water management, crop diversification, improving cropping systems (e.g. SRI, arecanut), drainage, soil fertility management, and pest management.
- The mean annual agricultural income from the household survey was Rs. 54,000 per household, ranging from Rs 5,000 to Rs. 3,30,000. Other non-farm income was relatively small.

Irrigation

- The main canals are contour canals and the height above the river increases with distance downstream. The system is in poor condition, most notably the right main canal where

water appears to be unable to pass from head to tail as a result of sediment blockage from about km 45. Below this water comes from the Bhadra system as overland flow and intercepted drainage (most likely the source of the sediment). The downstream 40% of the Gondhi system is therefore vulnerable to water shortage when the Bhadra system is not operating.

- There are 20 tanks within the right bank command area many of which are enlargements of the main canal. One of these tanks commands about 260 ha and has gated outlets to enable active management of supply. There are about 150 pipe outlets, typically serving 320 ha directly from the main canals. Some of these have gates but they are never operated and others have no gates at all. There is no engineered drainage system although there are many reports of water logging.
- The primary objectives of the modernization include supply of canal water to the lower Gondhi canal section and to save water that is to be transferred to a newly constructed irrigation area in the Upper Bhadra.

Community Based Organizations

- ***Water User Cooperative Societies (WUCS):*** There are 9 WUCS in Gondhi Right Bank Channel 3 of these have entered into Memorandum of Understanding (MOU) with KNNL on water management and have benefited from a one-time functional grant which is kept in the Bank as fixed deposit. On the left bank there is potential to form one WUCS. Overall the effectiveness and activities of WUCS in the project area is very limited which needs to be broadened.
- ***Farmers Field School (FFS):*** The project will use a specifically developed Farmer Field School (FFS) approach targeted at an area of 40 to 50 ha having a group of 20 – 30 farmers (Plate 8) as a mechanism to introduce improved agronomic and water management practices, and also to develop the institutional capacity of the WUCSs for water management and operation and maintenance.

Plate 8: Farmer Field Schools in other similar projects

4.2.4.3 Proposed Project

The overall objective of the project is to modernize the irrigation infrastructure so that a fully functioning irrigation system is left in place and WUCS that are independent self-sustaining entities capable of fulfilling their responsibilities including irrigation management; equitable distribution of water to farmers; O&M of minor canal system and collection of irrigation water charges; and, capable of interacting with service agencies including KNNL / CADA, Agriculture Department, Horticulture Department and other Departments to ensure that they receive necessary services. The goal is a significant improvement in water use efficiency coupled with an increase in agricultural productivity which in turn should lead to substantial improvement in the income of farmers.

The Gondhi scheme is proposed for inclusion in the first tranche of KISWRMIP because modernization is needed and, although the scheme has a small area, 74 km length of the right main canal replicates many of the operational issues of much larger systems. In addition, the Gondhi canal has, for many years, received supplementary water as return flows from the adjacent Bhadra canal system but this source of water is diminishing as that system becomes better managed. The terrain in the Gondhi command area is suitable for piloting alternative distribution systems and the area is sufficiently small to give potential having fully-functioning WUCSs along with (FFSs) within the implementation period.

The proposed interventions reflect the perceived project needs identified during the socio-economic survey activities. The following interventions are envisaged to upgrade the Gondhi system with a command area of about 4,600 ha.

4.2.4.4 Potential Interventions

- Monitor national and state-level agriculture-related support programs and identify those which could be promoted within the subproject areas.
- Promote a system of rice intensification during the Kharif season (Plate 9). The system comprises six mechanisms: transplanting early, transplanting carefully, spacing more widely, weeding and aerating, managing water, utilizing compost.
- Promote conjunctive use of water for Rabi crops. This may involve utilizing ponds for storing water, which is then applied to smaller plots or gardens. It may also involve extraction of ground water for irrigation.
- Demonstrate diversified crop systems that include a range of non-rice crops such as pulses or ground nut.
- Support a program that provides farmers with access to new high yielding seed varieties.
- Provide farmer training and promote irrigation scheduling and technologies leading to the efficient use of water (irrigation and rainfall)
- Arrange for Integrated Pest Management demonstrations to provide environmentally appropriate pest management and safe handling and storage of chemicals and the safe disposal of chemical containers.
- Support a system that improves farmer access to soil tests and provide training in the interpretation of such tests.
- Provide training to farmers on the use of fertilizers and the control of environmental impacts
- Conduct Farmers Field Schools This training follows a seasonal cycle and takes place in the field.
- Explore contract farming options to improve market linkages.
- Arrange visits by WUCS members to other successful WUCS and agricultural sites. These would generally be organized within the state and could include visits to successful WUCS in other schemes or to relevant research institutes.


Plate 9: Rice Crop with effective tillers and panicles under SRI

Some of the types of activities that may be part of the FFS curriculum to be decided and agreed upon by the participant farmers themselves include:

- Season-long farmer field studies on a range of crop approaches e.g. ridge and furrow irrigation, check and basin irrigation and border irrigation etc,
- Crop-water budgeting sessions,
- Community interactions and consultations,
- Sessions on sustainable intensification of crop production (e.g. soil testing for integrated plant nutrient management) and ecosystem-based and ecologically-sound crop protection practices (i.e., Integrated Pest Management and pesticide risk reduction) and
- FFS Field Days for sharing results with other WUCS farmers and the whole community. A network of trainers will be developed under the project to support the FFS. FFS to FFS interactions will also be facilitated.

In addition to the emphasis on FFS, this component will also support:

- A limited number of demonstrations / adaptive trials,
- Field level physical works related to improved water use efficiency (laser levelling, sub-plots, etc),
- Field days
- Exposure visits,
- Staff capacity development, and
- Purchase of equipments (Plate 10)

Plate 10: A rotary hoe being used for weeding in rice field

Some programme particularly those related to strengthening the state-level water institutions state-wide education campaigns on Participatory Irrigation Management will benefit the farmers. The main stakeholders in the project include basin stakeholders, irrigation and drainage entities, farmers and villagers in the project areas. Within the project areas, it is expected that the project would positively impact over the households.

Agriculture sector growth has to increase significantly to alleviate poverty through raising incomes. Large productivity gaps exist in the agricultural sector between achievement and potential. Irrigated agriculture is expected to be the engine for growth but is constrained by a failing public irrigation and drainage system, inadequate maintenance, and poor water management. Rehabilitated, modernized, well-functioning, and fiscally- sustainable irrigation and drainage systems integrated with seeding of appropriate technology at farmers level in agriculture inputs and practices, are planned in KISWRMIP area for necessary agricultural growth. Water User Cooperative Society's and FFSs involvement in managing systems at the local level is critical for the sustainability of the system.

Water use for agriculture cannot be considered in isolation of other uses. An integrated approach within the river basin framework is needed to effectively promote sustainable water use planning, management, and operation. Strengthening of water sector institutions is critical for ensuring sustainable use of water, efficient, rational and transparent allocation of water for different sectors.

The general approach shall be a combination of task with innovative and assistance approach, However, sharing sessions and sharing of information materials will be undertaken.

A team approach with the concept of capacity building through mass participation to ensure outputs which are highly adoptable to the location shall be taken up. This will be achieved by initiating work in tandem with counterparts with clear specification of roles and task requirements to initiate a series of discussions and team building strategies with counterparts.

The activities will be guided by a keen passion to satisfy the specific requirements of the TOR which include community organization, capacity building, physical infrastructure, resource mobilization & networking, and professional management of the irrigation scheme and agricultural production.

- Project interventions would mitigate the natural distortion of ecology, increase in net sown area, enhancing cropping intensity and adoption of high value crops.
- Project interventions will motivate the farmers to practice increased and balanced use of fertilizers.
- Support and coordinate with other relevant agencies (FAO, ICRISAT) for improved agricultural production
- Improve the agricultural productivity
- Establish market linkages
- Support to agricultural development program
- Demonstrate diversified crops system

Rehabilitation and modernization of canals will improve the water management practices in the project area through WUCSs and FFSs which will improve equitable distribution of water in all reaches.

4.2.4.5 Methodology

To achieve the full benefits of the investments focused interventions related to linking improved water management and agriculture productivity would be undertaken in command area supported by proper delivery of Agricultural Support Services and Improved Production Technologies. This calls for improvement of extension services requires the integrated action of respective departments, with the active involvement of farmers in the identification of constraints and potentials for agricultural development in the project area.

The Farmers Field School (FFS) in this project is designed as training and capacity building forum for the members of the Water User Cooperative Societies (WUCSs). The training will use concepts of participatory technology development and hands on learning by doing coupled with field level trainings, through field studies. The objective of the FFS is to integrate practical lessons on water management and productivity in such a manner that it assists the members of the WUCS to implement water distribution and sharing arrangements that maximize the productivity of all its members and ensures equitable resource (water) distribution. The FFS uses water management, crop production and protection as entry points because these are closest to the farmers' hearts but the FFS experience allows farmers to experience group formation that becomes valuable in addressing other community concerns. While the primary objective of the FFS is water management and agriculture productivity, other concepts/trainings will be included in the curriculum, along the principles of integrated crop management. The FFS will bring farmers functioning as independent individuals to inter-dependent group members who actively generate, adapt and extend innovations and link well with other farmers. The members of the FFS would be linked with different departments for access to information about on-going programs, schemes and technologies. The following are a list of expectations and inclusion of the FFS.

- The outlet group of farmers will discover their own specific water management, water scheduling and water rotations.
- The farmers will also discover the importance of maintenance, and be facilitated to set up the longer term process needed to ensure long term functionality of their system
- For effective water management construction of field channel and improvement of drainage network must be complete before transplanting.
- Systems in place for management/rotation of water during the season, should be discussed pre-season, and tested in season

- Better land levelling (micro-levelling) improves the efficiency of water management; also pre-season, if not all the outlet, selected fields.
- Division of plots into smaller sub plots reduces cost of irrigating the fields, or for border check, also completed pre-season, with mechanisms to test these technologies within the growing season.
- Agronomic demonstrations within the farmers field school that includes the necessary training and field days.
- Demonstration of new technology will ideally be taken, providing further support for the sustainability of the group.
- In order to improve water use efficiency farmers will be trained and supported in optimal conjunctive use of water.

Social mobilization is prerequisite to effective farmer's participation in achieving the project objectives. In FFS, regular meeting of farmer's groups with facilitators to participate in need based micro-planning, implementation, monitoring and evaluation enhances social mobilization to optimum level. This also improves decision making quality and cohesion among WUCS. This activity will be linked to the mobilization contracts awarded under the WUCS development. Involvement of farmers at every step of activity improves local ownership and encourages capacity building. Transparency can be maintained through participatory monitoring of project activities. Dispute and problems can easily be resolved with participatory approach.

After proper motivation and awareness campaign model outlet will be selected on the basis of selection criteria described as under-

- Model outlet will be selected in general body meeting of Water Users Cooperative Societies.
- During first year of project outlet of WUCS president will not be selected as model outlet.
- Model outlet will be easily approachable to road side so that the other farmers of the command can conveniently reach and observe the demonstrations.
- Farmers of the outlet should be agreeing to work in group for common interest and follow the technical advice given by departments.
- All farmers should agree to undertake the Command Area Development

For successful implementation of agricultural and on farm water management activity factors like levelling, construction of field channels, drainage network, development of assured irrigation facilities, actively involvement of all outlet farmers in planning, implementation, monitoring, evaluation and adoption of the project are essential. The FFS is the platform that will bring farmers together, encourage them to identify their problems, find and test solutions and implement them. Over the period of the FFS a number of group development activities take place that build solidarity between the groups, encourage sharing and other activities that benefit the group as a whole, rather than individuals.

Therefore, before start of the FFS, farmers would be made aware about the different project activities and advantages of the project. They would also be informed about the importance of their cooperation in achieving the desired results, and certain criteria would have to be met before the FFS would be undertaken (for example, the group may have to agree to supply land for the development of the field channels).

Members of the FFS will enter a "Learning Contract" to ensure that each participant will share what he is learning with a number other farmers each week. They can use the FFS study plots to share with the other farmers each and these farmers will also be included in the Field Day.

To create awareness among farmers about agriculture water use and productivity improvement programme and departmental on-going scheme etc., officials of the relative departments will also participate in these field days and discuss with the farmers about the scheme. Use of more and more bio- pesticide, organic manures, vermi-compost, green manuring, will be the integral part of these field days and display materials posters, relevant literature will be prepared and distributed among the farmers. Scientists from SAUs, KVKs, officials from relative departments and farmers will participate in the group discussions.

The curriculum will build the technical/scientific knowledge and enhance process skills of trainers and farmers required to make them confident in working with communities along crop production and water management issues. The curriculum will also develop skills in leveraging policy support aimed at sustaining Water User Cooperative Societies (WUCS) to strengthen activities of management of irrigation systems. Curriculums will be developed at the initiation of the project and refined over time as new learning comes to light and with the benefit of experience. In the initial stages of the project the curriculum (for Master trainers, trainers and farmer facilitators) will be developed using the core team of external technical assistance, over the longer period these will be taken over by the 'master trainers' in each area.

The Core Team will be comprised of experienced international FFS Trainers/Facilitators and local staff from a technical line agency. The Core Team will be the Trainers/Facilitators of the season-long Training of Master Trainers/Facilitators. The experienced FFS Trainers/Facilitators will walk the local Trainers/Facilitators through the process of finalizing the ToT Curriculum and other preparatory activities during a 2-3 week workshop that should take place prior to the ToT. The members of the Core Team must have the skills of farmers, i.e., they should be able to guide ToT participants in growing a crop from land preparation to harvest. They will be key resource persons and lead facilitators of sessions in the season-long ToT until such time that the local Facilitators are confident to handle sessions. The Core Team will assist ToT participants in managing ToT-attached FFS. The Core Team will also be responsible for documentation and report writing on all the activities in the Training of Master Trainers/Facilitators. As Facilitators phase out and the Agriculture Support Capacity Building Programme matures, the local Facilitators will take on the role of managers of FFSs. They will assist in preparing work plans, budgets, and strategies to maintain quality of FFS and development of follow up activities within Water User's Cooperative Societies (WUCS). The training of master trainers will take place centrally in Shimoga, experts from relative institutions will be called upon to supplement.

FFS will be implemented by FFS Trainers, with backstopping from Master Trainers and in cooperation with the community, WUCS and local leaders at the outlet level. In the first year a team of two FFS Trainers - will conduct the FFS, in subsequent year the FFS facilitator will run FFS with the assistance of Farmer Facilitators. FFS will cover a total of approximately 30 meetings (2 preparatory and 28 FFS sessions) spread over two cropping seasons (Kharif-Rabi). Farmers sign a Learning Contract with the community when they sign up for the FFS. This signifies that they are accountable to and will share whatever they learn with the community. Based on the curriculum framework FFS Trainers will work with FFS participants to finalize the curriculum each season to make it responsive to local needs and problems. The FFS Trainers play a crucial role in ensuring that the environment and all resources contribute to the farmers' learning experiences. A Farmer Field School (FFS) consists of 25-30 farmers who meet initially one morning every week for the entire crop growing season. Each FFS meeting follows a cycle of the following activities: recapitulation of the previous week's session, the water and agro-ecosystem analysis of farmer field studies, a special topic, a group dynamics activity and evaluation of the day's session and planning for the following week. The frequency of sessions reduce in the second seasons as farmers become more confident in managing crops and water, and have gained skills in informed decision making. Employing non-formal education methods, the field is used as the primary

resource for discovery-based learning. The FFS educational methods are experiential, participatory and learner-centred. The process is facilitative and respects the experience that farmers bring with them. Farmers work in small groups to ensure that each one's ideas are shared. The FFS training culminates with the conduct of a Field Day where neighbouring farmers, WUCS and local leaders and related technical agencies/NGO representatives get a glimpse of the FFS learning process and results. A pre- and post-test are conducted as part of every FFS to assess what farmers have learned. The goal of the FFS is to bring farmers together to carry out collective and collaborative inquiry with the purpose of initiating community action in solving community problems. The FFS uses crop production and water management as entry points because these are closest to the farmers' hearts but the FFS experience allows farmers to experience group formation that becomes valuable in addressing other community concerns - especially those that have to do with the sustainability of WUCSs.

A typical FFS will include the following activities:

- Pre-planning workshops (community consultations, final composition of the FFS decided)
- Crop and water planning sessions, typically one before each of the Kharif and Rabi seasons
- Field study (approximately 1000m2, inputs are supplied for each of the 2 seasons)
- Training materials and other stationary (flip charts, markers, etc.)
- Field day for each of the crops (targeted at the WUCS)
- Provision for travel and honorarium for facilitators
- Group support grant

During the first cropping season, prospective Farmer Facilitators (2/FFS) will be selected from the FFS. Criteria for the selection of FFs will be determined by the core team in collaboration with Master Trainers, and is likely to include leadership, communication and entrepreneurial skills. During the first season, they will be trained in the Training of Farmer Facilitators. The core team will devise the curriculum while Master Trainers assisted by selected FFS Trainers will organize the training. The training builds teams of experienced Farmer Facilitators who will augment the pool of FFS Trainers. The 1st phase of the training - lasting for a week - will equip with more advanced facilitating, organizational and management skills. The next training phase for Farmer Facilitators involves apprenticeship in weekly FFS sessions of the second crop facilitated by FFS Trainers. Each apprentice Farmer Trainer will "shadow" one FFS. At the end of the season, all Farmer Facilitators will attend an Evaluation and Planning Workshop at district level. The forum will be used to prepare work plans, budgets, strategies to maintain quality of FFS and development of follow up activities within Water User's Cooperative Societies (WUCS). Training of the FFs will take place in Shimoga and will have a greater emphasis on training in extension methodologies.

Upon completion of their apprenticeship, Farmer Facilitators will implement FFS with backstopping from FFS Trainers and in cooperation with the community, WUCS and local leaders at the outlet level. A team of two Farmer Facilitators - from one outlet - will conduct the FFS. The rest of the processes will be the same as FFS conducted by FFS Trainers. Once a year, Farmer Facilitators will participate in a Refresher Course to update their technical and process skills.

Before the end of the 1st crop season, the concept of follow-up activities is introduced to FFS participants and participants brainstorm on what they want to do beyond the FFS. The FFS is envisioned to strengthen WUCSs. Throughout the 1st FFS cycle, the curriculum covers topics to help participants understand the role of the WUCS and the role of CADA in strengthening WUCS in the implementation of water management and crop planning. In discussions on post-FFS

activities, detailed plans should be defined as to ensure that WUCSs function as strong groups to carry out collective and collaborative inquiry with the purpose of initiating community action in solving community problems - especially those related to water management. Examples of follow-up activities from other state/ country can be shared for additional ideas. For example, in other state/country, FFS alumni continue to work together to carry out post-FFS Farmer Field Studies on topics that they want to learn more about. Some farmers' groups produce biological control agents at community level (Thailand). Some enter into contract farming arrangements (Vietnam). Still others form Self-help Groups (Cambodia). As groups mature, it is useful to think about forming networks of groups and designing different kinds of forums that will bring farmers together to discuss various themes. Examples of these forums are Farmers Technical Meetings - where representative of groups meet at district level to share results of field studies. A Farmers' Congress could be held at district level for the purpose of experience sharing, generating policy support, defining how to sustain local programmes and strengthening networking of WUCS.

4.2.5 Operation and Maintenance

The KISWRMIP is designed to help achieving the vision2 of Government of Karnataka: 'Integrated water resource management to achieve scientific and efficient management of water, to increase "crop per drop" through a mix of improved efficiency of water application and net water gains, crop yield enhancement, adopting practices that are environmentally sustainable and economically viable, closing the gap between the demand and supply of water and maintaining the quality of water.' Efficient and effective operation and maintenance of the entire irrigation system, starting from reservoir, main canals, distributaries and tertiary canals to the on-farm water delivery system is necessary to achieve these goals.

4.2.5.1 Key Objectives of Improved Operation

- Provide the agreed volumes of water to the WUCSs at the agreed times
- Ensure equity of distribution
- Prompt changing of flows in response to events such as rainfall or emergency conditions
- Maximize efficiency of water use and minimize losses
- Keep and disseminate information about water delivery to WUCSs and other
- Stakeholders

4.2.5.2 Key Objectives of Improved Maintenance

- Maintain the system in a suitable condition to meet the operational objectives
- Efficient expenditure of maintenance funds
- Minimize interruptions to irrigation flows due to maintenance or damage

In order to implement operation and maintenance objectives of KISWRMIP, the following actions are planned to be taken:

- Review of existing documentations like O&M Manuals, operation plans and practices with KNNL, CADA and WUCS;
- Discussion and review of irrigation system operation with KNNL engineers/authorities,
- Discussion and review of tertiary canal operation and on-farm water management with CADA/ WUCS; and

[2] Results Framework Document for Government of Karnataka (Department of Water Resources) (2011-2014)

- Using this input to develop broad operating principles and prepare subproject specific operation manual. WUCS input shall be used in development of the operation plan and WUCS shall have responsibility in managing some aspects of the plan.

Improving water use efficiency in irrigation systems is possible by saving and conserving water through efficient water conveyance, distribution and application; reducing losses; adopting better on-farm and crop management technologies; and shifting to crop varieties that use less water while giving higher productivity (either yields and/or financial returns per unit of water used). Crop management strategies to improve water use efficiency will reduce use of irrigation water by individual crops and at the same time it should increase productivity and overall agricultural production through use of the saved water elsewhere in the basin. With water, and not land, limiting irrigation area development in Karnataka, measures to increase irrigation efficiency and crop water productivity (increased farm household revenues per unit of water used) are central to the modernization process. These measures may include improved infrastructure and management systems, to address operational and seepage losses, and improved agricultural extension to address on-farm losses and enable yield improvements. Water use efficiency and "crop per drop" in the agricultural context involves emphasizing economic efficiency whereby farmers' crop choices are driven by maximizing their revenues and livelihoods within the constraint of diminishing water availability.

Improving efficiency would thus include improving reservoir management and performance and the optimum delivery of water at canal head to meet indented demands while reducing evaporation and seepage losses; reviewing operation policies and plans within overall water availability and basin allocations; plugging leakages, controlling unauthorized diversions and other unaccounted use; improving reliability of supply to avoid the farmers' tendency to over-irrigate; improved conveyance and distribution; improved field application efficiency that optimizes soil moisture, reducing evapo-transpiration from weed growth and using water efficient crop management practices; and, improved drainage.

Figure 8 shows schematically the distribution of water entering an irrigation system. For a surface irrigation system, the productive evapotranspiration (i.e. water actually used by the crops) is typically around 40% of the inflow. This is the headline irrigation efficiency. The balance of the water is split between other evaporation, surface runoff and percolation to groundwater. Unless the groundwater is saline or very deep, the percolation will effectively recharge the groundwater which can be reused. Surface runoff can also be reused (although water quality may progressively deteriorate) but water that evaporates is lost to the system. Reuse will also sometimes occur within schemes, particularly where percolation to groundwater is reused for well irrigation.

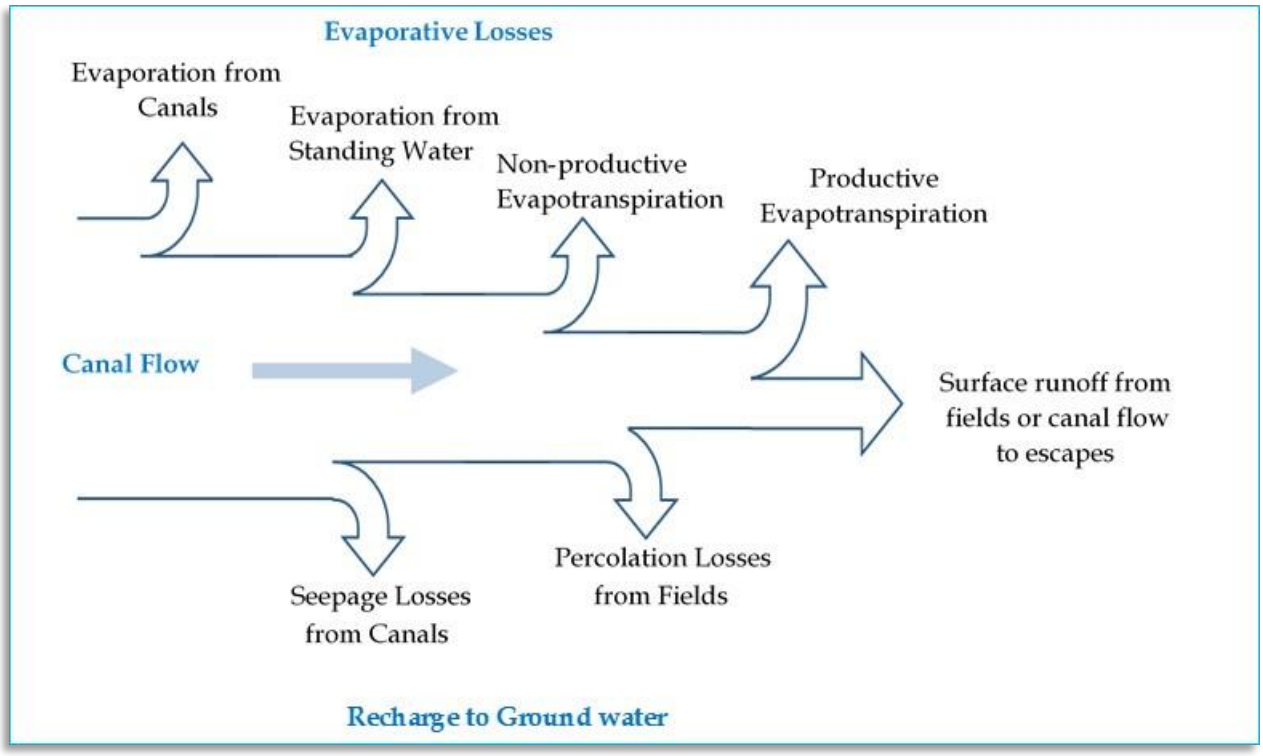


Figure 8: Schematic distribution of irrigation inflow (adapted from PPTA, 2013)

Reducing field demand will translate into reduced system demand. The amount of water to be supplied to the field can be reduced through changes such as:

- better response in reducing irrigation supply after rainfall;
- promoting crops with equal or better farm incomes but lower water demands;
- deficit irrigation at times when it does not affect yields;
- adopting agronomic measures such as system of rice intensification (SRI), sustainable sugar initiatives and anaerobic rice cultivation; and
- improved soil quality management techniques can also improve field water use efficiency.

More timely irrigation will raise yields to nearer the maximum potential. Increased reliability of irrigation supply is also needed to ensure that farmers are willing to move away from keeping their field moisture contents close to capacity in order to provide a buffer against supply interruptions.

The responsibility of operation and maintenance of the Gondhi Anicut Project lies with the Karnataka Neeravari Nigam Limited (KNNL) through its field office of Chief Engineer, Upper Tunga Project Zone, Shimoga. The project is under the jurisdiction of the Superintending Engineer, Bhadra Reservoir Project Circle, B R Project and the Executive Engineer, No. 4, BRLBC/BRRBC Division, Bhadravati, which consists of two sub-divisions, namely Bhadra Reservoir Left & right bank Canal (BRL/RBC) Sub-division, Bhadravati and Bhadra Reservoir Right Bank Canal (BRRBC) Sub-division, D B Hally under Assistant Executive Engineers No. 3 and 2, respectively as is shown in Figure 2.

KNNL does not get regular maintenance grants but only Capital Grants from the state for completion of ongoing projects. However this grant is used by KNNL for maintenance of assets already created. Presently KNNL follows the norm of Rs 600 (11 USD) per irrigated hectare / year as recommended by the 12th Finance Commission (for the period 2005-10) for estimating the requirements of funds for the maintenance of the major and medium projects. The revised norm

of Rs.1175 (21USD) with 5 per cent annual increment as recommended by the 13th Finance Commission (for the period 2010-15) has not yet been adopted and is reported to be under discussion with the Government. However the actual allocation of funds by the state for maintenance works in a year is generally based on the fund availability and the priority of the works as decided by the state government under its budget.

Total maintenance expenditure of Rs 3497 lakh for the 5.89 lakh ha under KNNL represents an average expenditure of Rs 593/ha which is similar to the recommendation of the 12th Finance Commission recommendation. Given the poor state of repair of many irrigation systems much higher expenditure is needed to bring the infrastructure to a condition where maintenance expenditure will conform to budget norms rather than the greater cost of addressing the dilapidation caused by many years of inadequate maintenance.

Establishment of WUCS is being undertaken with the objective of devolvement of operation and maintenance of the minor canal system. Where an O&M transfer MOU with a WUCS exists, the WUCSs is charged by KNNL at Rs12/1000m³ for bulk water supply. The WUCS then collects water charges from farmers at the normal rates with the balance used for WUCS expenditure.

Where O&M transfer has not taken place then water charges are levied on farmers according to crop and season currently Rs 250/ha paddy, Rs 1000/ha sugarcane and Rs 150/ha for garden (tree) crops. It is proposed that collection of water charges is undertaken by the WUCs, and used for O&M, 30% being passed on to WRD for overheads. Currently collection, such as it is, is made by the Revenue Board and funds are subsumed into general revenue. Even at 100% collection the water charges are only about 30% of the total O&M cost, with no contribution to capital replacement.

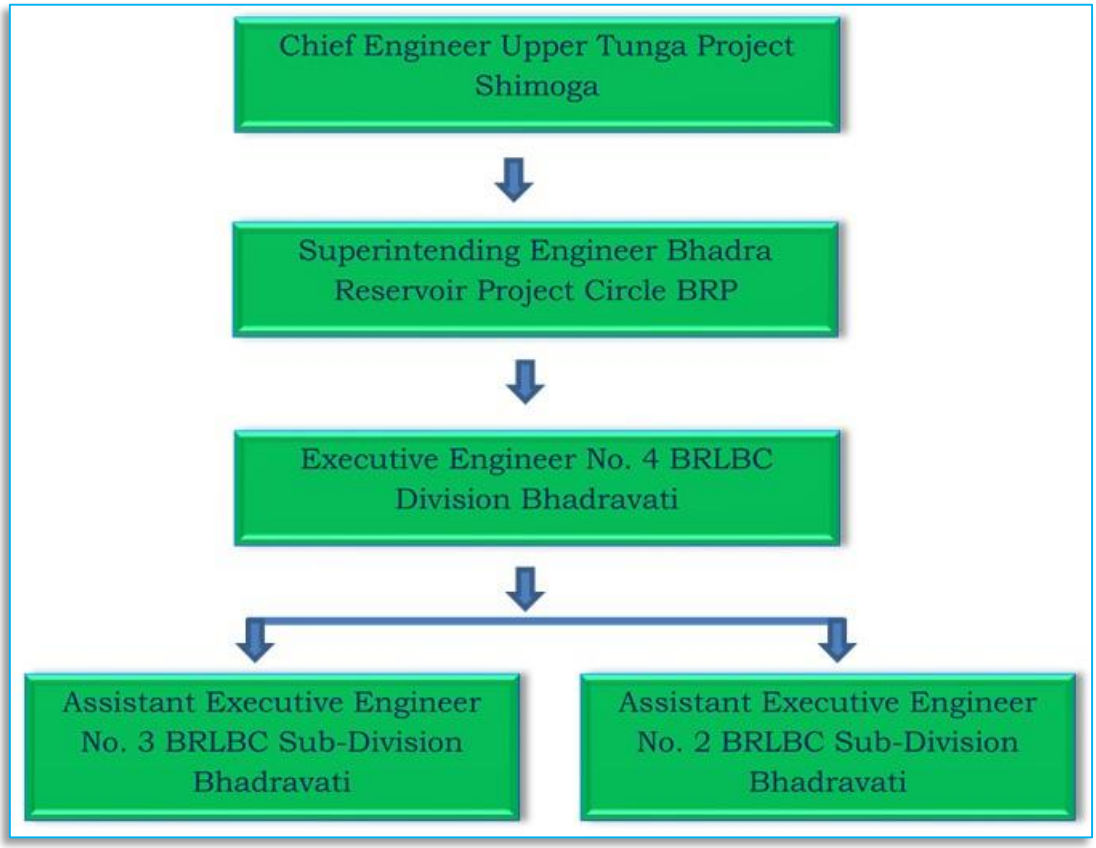


Figure 9: O&M Responsibilities for Gondhi Subproject

4.2.5.3 Main System Flow Measurement

Improved flow measurement will provide information to support better operation of the irrigation system both in terms of day-to-day flow management and quantification of flow volumes supplied. Main canal flow measurement will use electronic flow measurement devices with telemetry to enable real time data acquisition to guide system operation. Likely measurement points are at boundaries of WUCSs, at major inflows and possibly at selected command area outflow points.

In addition, flow measurement using flumes with water level and flow volume recorders is proposed for all outlets so that water provided to each WUCSs can be quantified.

4.2.5.4 Improved Operation and Maintenance

Support to System Operation

The investment in improved infrastructure will not alone achieve the expected improvements in agricultural production and water use efficiency. System operators will need support to enable them to make best use of the system. Capacity building of the KNNL/WRD staff is required to enable them undertake more efficient and effective operation and maintenance of the irrigation distribution system. Specific training of system operations staff will be provided to enable them to benefit from the flow measurement and information system to achieve more responsive and equitable operation with minimal wastage and to support the WUCSs.

Capacity building of the WUCSs is required to enable them undertake more efficient and effective operation and maintenance of the irrigation distribution system. Attention must be given to ensuring that vulnerable groups such as women are included in this activity.

System Maintenance

Inadequate maintenance has been a contributory factor in the progressive deterioration of the irrigation system. Achievement of the expected performance of the modernized system will depend upon improvement in the maintenance regime to maintain full functionality. Effective maintenance requires not only improved asset management but also ensuring that sufficient financial resources are mobilized to meet the cost.

O&M Manual

A comprehensive operation and maintenance manual will be prepared in consultation with KNNL, CADA and WUCS for each of the projects. The manual will include:

- Project description including physical features / resources, command areas, infrastructure, WUCS status etc
- Background data pertinent to the scheme
- Appraisal of current O&M practices
- System operation guidelines including use of flow measurement to inform improved operation
- Basic data needed for preparation of seasonal operational plans in conjunction with the WUCS
- A methodology for preparation of the seasonal operational plans
- System maintenance guidelines
- A methodology for prioritizing maintenance and preparation of annual maintenance plans
- Guidelines on administration

O&M Training

Proposed training will involve both formal training courses and on-the-job support and capacity building. On-the-job training will also be carried out to support improved system operation and maintenance as set out in the O&M manual. Proposed training is set out in Table below:

Figure 10: Proposed Irrigation O&M Training

Stakeholder	Capacity Building Objective	Planned Activities	Training Content (in addition to general capacity building)
KNNL / WRD	Improved water management and delivery and effective maintenance and delivery and effective maintenance	Study tours Training courses On-the-job training /mentoring	Introduction to IWRM and water use efficiency Management of irrigation systems Flow measurement System losses and inefficiencies Water Resources Information Systems Asset management Gender issues in irrigation planning and operation Preparation of operational plans Feedback and operational improvements Maintenance planning Introduction to irrigated agriculture Participatory irrigation management Benchmarking performance indicators
CADA / Dept. of Agric.	Improved capacity to deliver support to farmers	Study tours Training courses	Introduction to irrigated agriculture Participatory irrigation management Benchmarking performance indicators
WUCSs	Beneficiary operation and maintenance	Training courses Technical support and guidance	Introduction to irrigated agriculture Preparation of operational plans Participatory irrigation management Maintenance planning

4.2.6 Project Monitoring Information System

4.2.6.1 Requirement

The PSC needs to develop a user-friendly, interactive, web-based computerized Project Monitoring Information System (PMIS) for monitoring of KIWRIM Tranche-1 and Tranche-2 activities.

This system should provide suitable flexible interactive user-friendly tools to allow collation of inputs from various implementing agencies, produce standard reports, and allow specialized queries to track all aspects of project progress (including physical and financial progress and project impacts) at any time. The PMIS will monitor all key inputs and activities under the project including the procurement and financial management aspects.

4.2.6.2 Procedure

The Consultant would develop an integrated, user friendly web-based software to manage project activities and track key project indicators, install this on a secure web-server as per PMU's specification and ensure that this can be accessed (with password protection and other security measures) by all project implementing entities.

The Consultant will develop:

1. ***Input key monitoring indicators*** for each project agency at appropriate administrative levels, including engineering divisions under trance 1 and tranche 2 , with appropriate security and access provisions and error-checking. The Consultant will test the system in each office and train the staff of the line departments in updating the information.
2. ***Develop standard and specialized queries*** on the monitoring knowledge base and appropriately processes the data already entered **and generate** reports, including appropriate graphics, maps, and schematics, through user-friendly interfaces that allow for easy customization and expandability.
3. ***Develop reporting tools*** in consultation with the PPMU for generating of standard monitoring reports from various perspectives of the project. Regular monitoring reports will be designed the \consultation with PPMU and included in the project website and newsletters.
4. ***Develop data management needs and information flow arrangements*** in consultation with the PPMU to ensure smooth and effective functioning of the PMIS. This will include both information to be collected by the Consultant, as well as information to be input by various project agency staff.
5. ***Host the PMIS web-based software and Test Access*** by the PPMU and other line agencies during the life of the project ensuring that the software will be accessible at all times after its deployment with at least 95% uptime and troubleshooting assistance.

Project Monitoring Information System (PMIS) helps in Monitoring and evaluating various project activities. Success of establishing and implementing any PMIS is directly dependent on the quality of data collected during the initial setup of the system. It is the most critical phase of the system and depends upon the authenticity of physical attributes of the activities and assessment of these. Therefore, there is a need to carefully develop the data collection formats taking into account the present organizational setup of executing agency, their strength and weaknesses. It has to be simple and user friendly and should be completed in the acceptable time frame.

Developing strategies and detailed information capture methodologies to obtain information on all monitoring indicators and track progress towards achievement of the project Objectives. This early activity will provided the base requirements to carry out further Design of the Web Based PMIS Application development.

To assist in facilitating and standardizing the information collected by respective departments standard forms are being designed to collate the information necessary for Monitoring and Evaluation. After having initial discussion with PPMU and other line department officials, PIUs of pilot districts and detailed discussion among the Consultant team, final set of formats is broadly divided into:

- Irrigation
- Agriculture and Economics
- Social and Environment
- WUCS/ Community

It is essential that the team earmarked for collection of data by the implementing agencies is well versed with the format details, suitably trained and have necessary attitude & aptitude for this type of work. These formats will be discussed in detail in the Monitoring and Evaluation Strategy.

Information is a valuable resource for project managers and implementing agencies. Implementing a Web based Project Monitoring Information System (PMIS) is one way to address critical project Information which helps in:

- Getting right information to make the right decision at the right time.
- Systematic reporting with more qualitative and quantitative information on the progress of the outcomes.
- Navigate through all the data produced by projects.
- Improving the timelines of reports to all stakeholders.
- Information transparency and accountability for results
- Customized Queries for generation of various reports
- Communicate project information and documents with easily updated postings, news, archives, notifications and publications to all relevant stakeholders.
- Allows the project team to track the status of various project activities in order to determine the work that is completed and the work that is still pending with respect to both Physical and Financial Progress throughout the project's life cycle.

4.2.6.3 Development of MIS

Approach for design and development of on line PMIS Software will be done in discussion with the client. The next logical step would be to design and develop the On Line Project Monitoring Information System (PMIS). The PMIS to be developed will be integrated, user-friendly and web-based. Hence, this system will not only facilitate key persons in all implementing agencies to feed information, it will also help them to run custom made queries to analyze data and provide feed-back on status of the progress of different activities. Concerned officers will also be provided web based guidance real time assistance for optimal use of the PMIS. Most of the routine information collection will be done through the PMIS system, and this database will be supplemented with direct data collection on different aspects. The design of 'integrated, user-friendly and web-based software' will involve:

Design front-end and end-user interfaces

The PMIS software could be divided into three components, i.e., Data entry formats, Database, and the Analytical Tools. The data-entry formats guide the user to facilitate feeding only the required information. The database stores such information. And the Analytical tools help the user to retrieve the data and analyze it to get answers to the queries. Hence, designing of the PMIS involves careful designing of these three elements and converging them into one integrated system.

The Formats, which are used by the common users to feed information, are the most frequently used interface. Hence, care should be taken to keep them simple and user-friendly.

The design of the data-collection formats to be used by different stakeholders at different times will be finalized in consultation with client. These formats now need to be converted into digital format, i.e. web-pages. While converting them into web-pages due care will be taken to keep the data-feeding process easy. Wherever possible drop-down menus will be provided, fields will be custom defined to help them to feed correct data in right field etc. Provision for inter and intra-format navigation will also be made.

Design of the database architecture

As discussed earlier, the second component of any PMIS is the database that stores the information. Keeping the nature of the data to be stored and the pattern of data retrieval, architecture of the database will be decided. The architecture of PMIS software system will be open standards and scalable. Architecture will make sure the software system will meet the requirements of the product, as well as ensuring that future requirements can be addressed. The architecture interfaces between the software system and other software products, as well as the underlying hardware or the host operating system will be compatible.

Developing the software linking end-user interface and database

Once the database architecture is ready and the end-user formats or web-pages are ready, they will be linked to each other. The linking process will keep the data flow arrangements. The following points will be addressed during this phase:

- UI and display logic development
- Project Monitoring Logic Component development (enhancement/creation as required)
- Data handling components
- Creation of data /general information validation components

In addition to this, provisions for data validation and checks, institutional arrangements and security precautions to ensure smooth and effective functioning of the PMIS will be considered.

Developing standardized and specialized queries

The third component of the PMIS system is the data-retrieval system. The data-retrieval system has one sub-component. The first component comprises of the customized queries based on a fixed list of questions. These queries are made available with the PMIS in a pre-defined or system defined format.

As most of the monitoring parameters and indicators will be fixed, the queries are expected to be mostly system defined. However, it will be wise to keep options for user-defined queries to enable the system to provide additional information. Predicting the entire range of information requirement at the project planning stage is not possible. Unpredictable problems if any that surfaces during the project execution time needs to be served through this user-defined queries.

Developing the Reporting Tools/Formats

We need to prepare and submit regular reports throughout the project period. The regular reports include monthly, quarterly, half yearly and annual reports. The content of these reports are defined in the M &E framework and strategy report. The structure of these regular reports as described in TOR needs to have following sections:

- Summary of work completed in last half period and cumulatively
- Work Expected in next six months

- Key Issues for attention of PPMU
- Process Monitoring
- Presentations/Documentation/Videos

Software testing

After designing and linking of all components of the PMIS is complete, the integrated software will be ready for use. Before it is put to use, one needs to test it. The software will be tested through software testing professionals. The following will be part of the software testing:

- Component Testing
- Integration Testing
- System Testing
- Acceptance Testing

In addition to this, it will also be tested through the actual users.

Web-hosting and software testing

Once fully equipped and operational system prepared it will be installed at different locations, the next step for linking them through internet will be done. As a preparatory action, the web space will be procured or reserved for hosting PMIS on the cost of client. Once the software is hosted in web, its proper functioning will be checked with the end-users. All complaints will be resolve either through remote assistance, and if the need arises, even by visiting their office. The proper functioning of the PMIS software will be tested again after this web-hosting to be doubly sure that the system is functioning properly.

Development of on-line tutorial

A users' manual for the PMIS software will be developed and will be made available as part of the standard PMIS module on help menu. In addition to this, on-line access to the software administrator will also be provided. The whole experience of testing PMIS software at piloting and web-testing stage will throw enough opportunity to identify common errors. These errors will be addressed and remedial steps will be suggested.

Pilot Testing of the PMIS

This pilot testing will be done from selected locations. In this piloting phase, the system will be verified by the Project team members. Project team members will visit these places and operate the systems and test different functions along with the concerned users. Any software problems identified will be removed.

Workshop for Demonstration of PMIS to PIO/PMU

After the Software is thoroughly tested and distributed to the concerned functionaries as per the requirement, a demonstration workshop will be organized at PIO/PMU. In this workshop different components and functions of the PMIS software will be demonstrated to the review committee at PIO/PMU.

Finalization of PMIS

After the demonstration of PMIS to PPMU, any suggestions for improvement are noted. These will be incorporated and the PMIS finalized accordingly.

4.2.7 Civil Works Procurement

The PSC needs to support PMU and PIO with civil works procurements for Tranche-2 subprojects by providing training in ADB procurement guidelines and assist with packaging of contracts as per the procurement guidelines of SGoK and ADB.

Normally, the project procurement activities include:

- Prepare requests for expression of interest
- Evaluate prequalification of contractors
- Prepare tender packages to SGoK/ADB requirements
- Prepare Procurement Schedule and Notices
- Prepare invitations to tender and distribute tender packages
- Address requests for clarifications
- Prepare selection criteria for contractors
- Evaluate tenders and prepare tender recommendations
- Participate and advise in Tender Negotiations
- Prepare and distribute Contract Documents

The PSC will carry out all the necessary procurement tasks and support PMU to procure the agreed number of project packages as per FIDIC Red Book/ADB/SGoK procurement rules. Before the actual procurement works begin for Tranche -2 subprojects, the Consultant will conduct a training program for KNNL engineers and procurement officers on the relevant procurement guidelines.

4.2.8 Quality Control and Construction Management/Contract Management

4.2.8.1 Requirement

The PSC will provide support for quality control and improved construction management/contract administration for Gondi irrigation subproject by providing training and other support for KNNL, PIO, contractors etc to facilitate in programming works, recording measurements etc.

The modernisation contractor is required to set up a laboratory to conduct the necessary tests for quality assurance and compliance. An independent third party hired by KNNC will carry out the construction supervision. The PSC will support the KNNL PIO Bhadravati responsible for the implementation of Gondhi modernisation civil and other works by providing the training on the different aspects of quality control and contract administration in the very beginning of the assignment, preferably before the modernisation contractor is mobilised to the construction sites.

4.2.8.2 Construction Management Activities

Typical activities in the construction management may include but not limited to:

Planning and preliminary works

- Establish an efficient organisational structure
- Define clearly the duties and responsibilities of the supervision engineers
- Develop the Construction Supervision Manual
- Review Contractor's work program, method statements, resources, materials, equipment and machinery etc

Construction Supervision and Contract Administration

- Supervise and Monitor Construction Works including visit and monitoring of sites
- Coordinate between contracts
- Monitor and enforce occupational and public health and safety
- Monitor and enforce QA / QC during all construction activities including material testing (Figure 11)
- Measure works and verification of bills for payment
- Approve the payment certificates
- Verify contractor's claims for time extension, variations, and additional compensation
- Monitor physical and financial progress
- Carry out inspection and witness testing of materials
- Supervise and monitor the implementation of EMP
- Monitor implementation of Resettlement Plan
- Resolve disputes
- Keep records of all correspondences, meeting minutes, and other relevant documents
- Review O&M Manuals
- Review As-Built drawings

Commissioning and Final Acceptance

- Monitor installation and commissioning of each component of works
- Manage handover of completed / commissioned works
- Prepare final completion report with as-built drawings
- Handover all project documents to the client

Outlining the most of above-mentioned activities, a similar generic process for civil construction management is given in Figure 12 for handy reference.

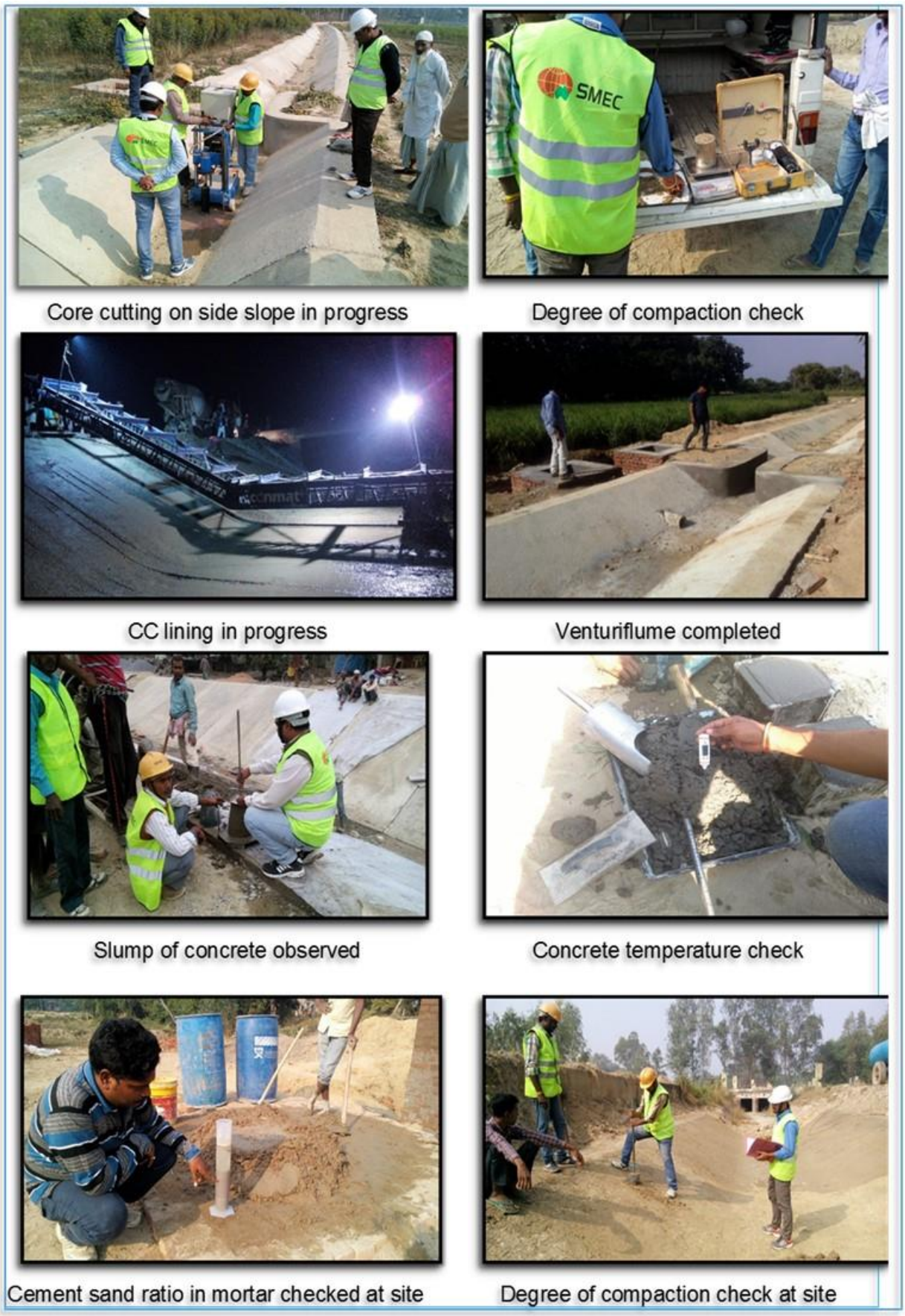


Figure 11: SMEC staff doing canal construction quality control works in UPWRSP WB projects

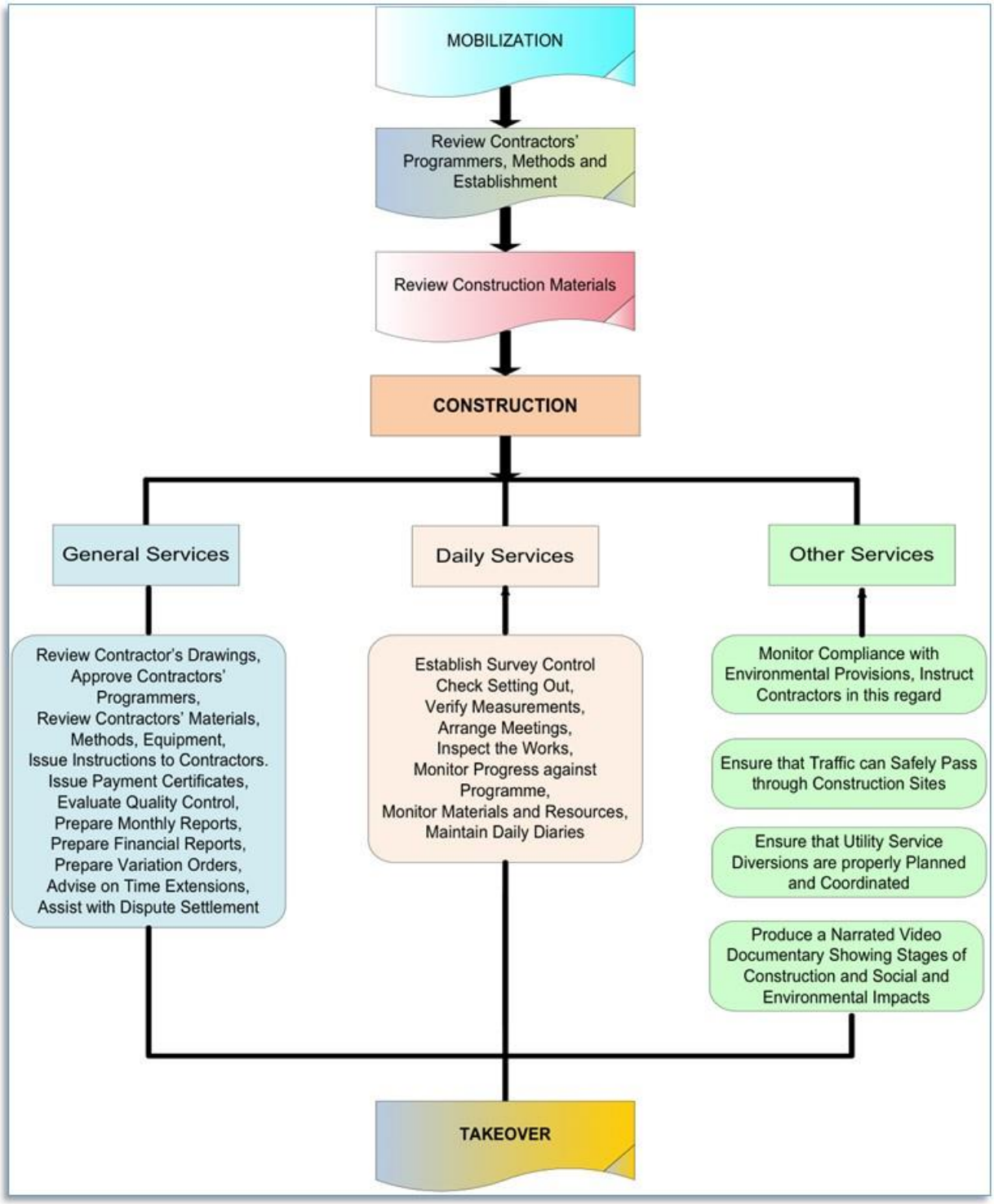


Figure 12: Construction Supervision Flow Chart

4.2.9 CAD Works

Before the actual CAD physical construction works begin, all necessary WUCS institutionalisation activities will be completed. WUCSs will be registered as legal entities as per the Cooperative Act. The trainings will be completed on necessary organisational and management skills and basic construction techniques.

At present Bhadra CADA is engaging WUCS to carry out CAD works at tertiary level i.e. below the outlet level. WUCS are given the On-Farm Development works such as field channels, field drains, farm roads and conjunctive use to the tune of INR 5,00,000.00 (Rupees Five Lakh per agreement) for each agreement and there could be more than one such agreement. The professional support consultancy will provide technical and managerial assistance to PIO and WUCS in assessing, prioritising, estimate preparation and implementation of the OFD works. Walkthrough survey shall be carried out by SSTs along with WUCS to identify the OFD works. There shall be an exclusive training on the technical issues on timely, quality and quantity work.

4.2.10 Feasibility Studies for VNC and TLBC

For each subproject, a participatory feasibility study involving water users and other stakeholders and necessary due diligence will be prepared, covering technical design, economic and financial viability, institutional arrangements, social assessments including social safeguards plans as applicable, environmental analysis, and an implementation plan.

The feasibility studies will be prepared by building upon the detailed design reports (DPRs) of the selected subprojects, VNC and TLBC, prepared by KNNL, which consists of water resources assessment and irrigation water requirement computation, technical designs and drawings including subproject development costs. However, the PSC has so far received only the main report of detailed project reports; drawings and detailed cost estimates have not been shared.

The Facility Administration Manual (FAM) clearly outlines the subproject selection criteria for modernisation of irrigation system under the KISWRMIP. Accordingly, for individual subproject feasibility assessments, the following criteria will apply:

1. technical feasibility, with no significant technical risks that would undermine efficacy, economic return, safety, or sustainability;
2. reliable water availability and quality, with no significant negative impact on the other users of the same source or the ecosystem downstream;
3. financial and economic viability with an economic internal rate of return of over 12% with robustness under sensitivity and risk analysis;
4. social and environmental soundness with no significant negative impacts;
5. consideration of gender mainstreaming principles;
6. fulfilment of safeguards requirements (involuntary resettlement, indigenous peoples, and environment) of the Government and ADB, including the preparation of required safeguard planning documents prepared following the Environmental Assessment and Review Framework and the Resettlement Framework, and efforts to minimize land acquisition and resettlement in the planning and design process; and
7. a record of consultation and participation of the stakeholders prior to and during the feasibility study, with concurrence of the concerned water user cooperative societies (WUCS) on the basic design, including farmer contribution (in cash or in kind) equivalent to 10% of the contract value (as per the Government norms which is currently under practice), for minor facilities and command area development works like Field Irrigation Channels and Land Reclamation (in accordance with prevailing Government norms and practice), and operation and maintenance (O&M) of the minor facilities within the WUCS boundary.

4.2.10.1 Technical Feasibility

As both VNC and TLBC are rehabilitation schemes, the issue of technical feasibility is expected to be normally non-existent. KNNL has already carried out the technical design of modernisation works including technical drawings and development cost estimates. However, the PSC will carry

out the sample field verification of some of the designs to assess the compliance of the designs against the good industry practices and relevant Indian or international codes of practice. VNC DPR was submitted for the review of CWC and KNNL has already obtained the approval of CWC for subproject implementation.

Cost estimates, particularly for the safeguard implementation and O&M, may need to be either checked for adequacy or included if not considered earlier.

4.2.10.2Reliable Water Availability and Quality

Both are rehabilitation schemes with predefined allocation rules to these systems that have been in operation for years so the existing water allocations are not expected to impact on the downstream aquatic ecosystems. KNNL engineers are all adequately skilled in this regard and this is clearly evident by the CWC's review and approval of the project proposals.

4.2.10.3Financial and Economic Viability

As per the FAM requirement, the subprojects have to be financially and economically viable at the internal rate of return of over 12% and robust under sensitivity and risk analyses. Normally, KNNL and SGoK accept the lower return on irrigation projects. All the costs of project development and allied safeguard implementation as well as the project benefits will be reviewed by the respective specialists and if necessary, these viabilities will be updated.

4.2.10.4Social and Environmental Safeguards

The Social Management Frameworks including the Gender Action Plans will be prepared based on the relevant ADB guidelines. In the similar manner, the IEE or EIA as necessary will be prepared based on the KISWRMIP Environmental Assessment Review Framework (EARF); all potential environmental impacts will be assessed including mitigation measures and associated costs of implementation of mitigation measures. As these are rehabilitation/modernisation schemes, potential impacts are expected to be mitigated with use of appropriate measures.

4.2.10.5Consultation and Participation of Stakeholders

A consultative process will be adopted and fully documented demonstrating the involvement of stakeholders in the subproject identification and development process. This will include a communication plan for the subproject. Based on preliminary assessment of status of WUCS institutionalisation in the subprojects, the formation of the WUCS, registration and signing of MoU with KNNL and CADA may take significant time considering the sizes of the subprojects. For this reason, a communication plan will be developed to ensure that the subproject selection criteria are adequately explained to the potential WUCSs and their necessary endorsement for the modernisation proposals are obtained. Meanwhile, all necessary processes of WUCS development and capability building works continue.

The Asian Development Bank's (ADB) safeguard policy that stresses on the conduct of meaningful stakeholders consultation with the affected persons and civil society for every project identified as having multiple dimensions of project impact. During the PPTA, the Stakeholder Participation and Consultation was carried out (as detailed in Appendix 8 of Volume 2: The Appendices of PPTA) and the findings of these shall be utilised while carrying out further feasibility studies. One of the basic exercise that would be carried out during the feasibility study for WUCS and Agriculture Development is to derive area delineation for each WUCS, assess the Ayacutdars list (list of water users in command area), season wise crops grown, scope for productivity

enhancement, marketing opportunity and business opportunities for WUCS, feasibility for installing telemetry for volumetric supply, demand, collection and balance, etc.,

The feasibility study reports for the subprojects will be prepared complying all selection criteria, and subsequently the PSC will assist PMU with preparation of subproject appraisal reports for the approval of ADB.

4.3 Detailed Methodology

Our approach to deliver the project is guided by established IWRM principles and will focus on assisting the Client in successfully achieving the three outputs of the Program within time with required quality. Success in the proposed Project would require the PSC's team to remain flexible and supportive of the Client. To achieve this, SMEC will adopt a collaborative approach throughout the life of the assignment. This means that our team will maintain an effective communication with the KNNL, PMU, PIOs, WUCS, WALMI, KERS, RICM, ADB and other key stakeholders and will cooperate as required. Our project team will forge a close relationship with PMU and PIOs and function as a fully integrated team. To ensure effective communication and coordination between stakeholders, SMEC will develop and operationalize an Interface and Communication Management System early on the project.

The comprehensive approach for understanding the tasks assigned to PSC in close collaboration with the KNNL has been conceived to achieve PSC's objectives. The significant attributes (task number, title of the task, brief description of task, responsibility within the project team, counterpart participation, and expected outcome, linkage to deliverable, time schedule, and recurrence) of each of these tasks are delineated to provide a comprehensive picture.

A brief methodology for carrying out individual tasks and sub-tasks are given here. As the assignment progresses, these methodologies may be updated to suit more to the project needs based on the lessons learnt through implementation. This should be read in conjunction with Table 13.

1. Project Initiation

Major Task:	1. Project Initiation
Sub-tasks	
1.1 Project Initiation 1.2 Team Mobilization and deployment of staff	1.3 Start-up Meetings with KNNL Officials - Gain understanding of project activities 1.4 Office Set-up and Logistic arrangement

1.1 Project Initiation

Subsequent to the award of the consulting services contract, the project Team Leader along with DTL/PIM travelled to Shimoga, Karnataka to establish a project office. The project office has been established at House No #28, First Cross Street, Gandhinagar, Shimoga including guest houses for the accommodation of project staff. The office is now fully functional, equipped with the furniture, computers and communication equipments.

1.2 Team Mobilization and Deployment of Staff

All major specialist staff including support staff have been mobilised so far especially for the inception report preparation (Table 11). These staff have extensively carried out filed visits and consulted KNNL staff in Head Office and field offices in Shimoga and Munirabad. As mentioned earlier in progress section, also visited were CADA and Agriculture office in Shimoga and Munirabad.

Table 11: Project staff mobilised during project inception stage

Name	Position	Input	Mobilization		Status as on date
			From	To	
International Specialist					
Dr Ashok Raut	Irrigation Specialist/TL	Intermittent	07.12.2015	04.03.2016	Continue
National Specialists					
Doraiswamy R.	DTL/PIM Expert	Continuous	01.12.2015	Continue	Continue
Dr A Rajagopal	Water Institutions Specialist	Intermittent	28.12.2015	20.01.2016	Demobilized
Dr K. Balachandra Kurup	Social Dev & Gender Specialist	Intermittent	06.01.2016	16.01.2016	Demobilized
Dr V P Singh	Agriculture Specialist	Intermittent	10.01.2016	17.01.2016	Demobilized
Jitendra Agrawal	MIS Specialist	Intermittent	07.12.2015	23.12.2015	Demobilized
Dr M K Khaishagi	O&M Specialist	Intermittent	26.01.2016	28.01.2016	Demobilised
Srinath Anekal	Environmental Specialist	Intermittent	27.01.2016	30.01.2016	Demobilised
Technical Support Staff					
Sairamulu Saidugari	MIS / IT Support	Continuous	15.12.2015	Continue	Continue
Deepak Kumar G N	Site/Design Engineer	Continuous	08.01.2016	Continue	Continue
Administrative Support Staff					
Giridhar A G	Office Manager	Continuous	08.12.2015	Continue	Continue
Naveen Kumar S P	Computer Operator	Continuous	14.12.2015	Continue	Continue

1.3 Start-up Meeting

As mentioned earlier, the project startup meeting was held on 23/12/2016 at the KNNL H/O Bengaluru where the Team Leader presented the Consultant's scope of the works of the assignment that was discussed in detail. The meeting stressed upon the PSC to complete the feasibility studies of VNC and TBLC the earliest possible.

1.4 Office Set-up and Logistic Arrangement

As mentioned earlier, the Consultant's Project office has been established in Shimoga and fully functional with transport and accommodation for specialists including communication system.

2. Preparation of Inception Report

Major Task:	2 Preparation of Inception Report
Sub-tasks	
2.1 Collection of all Project Documents from Client including Tranche -I	2.4 Review of Deployment Schedule of Consultant, Team Office Set-up and Logistics arrangements
2.2 Review of documents and discussion with various project stakeholders and reconnaissance visits to sites	2.5 Preparation & Presentation of Inception Report
2.3 Review of Methodology & Work Plan	2.6 Submission of Inception Report

2.1 Collection of all Project Documents from Client including Tranche - 1

As mentioned in Section "Basis of This Report", the Consultant has already collected the following relevant documents from KNNL H/O and field offices in Shimoga and Munirabad:

- Karnataka IWRM Concept Paper
- KISWRMIP Facility Administration Manual
- PPTA Reports for KISWRMIP
- Gondhi Feasibility Study Report
- Gondhi, VNC and TLBC DPRs (only Main Reports)
- Several other relevant documents such as FAO Irrigation Manuals
- FAO MASSCOTE Report for Gondhi Subproject

The Consultant will collect the cost estimates and drawings for all subprojects from either KNNL field offices or PMU. During last visit to Munirabad, the Consultant looked for the cost estimates including design criteria and hydraulic and other structural computations, and drawings of VNC and TLBC and could not find those documents. These documents are urgently required to understand the details of the modernisation works.

2.2 Review of Documents and Discussion with various Project Stakeholders and Reconnaissance Visits to sites

Reconnaissance visits were undertaken to all three subprojects. During these visits, even field level offices of KNNL, CADA, WUCS, and AC-IWRM and other line departments were visited and discussed about the relevant aspects of the subprojects.

2.3 Review of Methodology & Work Plan

The Team Leader / Irrigation Specialist along with other team members has reviewed the methodology spelt out in the original technical proposal and the document has been updated

based on the information obtained through field visits and detailed review of relevant project documents. Accordingly, the methodology and work plan have been updated and presented here.

Based on the enhanced understanding of the project scope of works, the Consultant has presented detailed approaches for major components of the works:

- WUCS Mobilisation and Awareness
- Capacity Building
- Social and Environmental Safeguards
- Agriculture Development
- Operation and Maintenance
- Project Monitoring Information System and MIS
- Civil Works Procurement
- Quality Control and Construction Management/Contract Management
- CAD Works, and
- Feasibility Studies for VNC and TLBC

Accordingly, the Consultant has updated:

- Technical Approach and Methodology
- Work Plan
- Project Organisation, and
- Staffing Schedule

2.4 Review of Deployment Schedule of Consultant Team Office set-up and Logistics arrangement

Arrangements have been made through the SMEC's local office to organise logistics and facilities required by the Consultant team. This includes items such as vehicles, computers, printers, photocopiers, air conditioners for residences used by PSC team members, etc.

2.5 Preparation & Presentation of the Draft Inception Report

Compiling all details of field visits, review of project documents, technical approach and methodology for works including work plan, staffing schedule and project organisation, this Draft Inception Report has been prepared for submission. This report will be presented in the review meeting organised by PMU.

2.6 Submission of Inception Report

After the receipt of the review comments and suggestions, the draft submission will be updated by incorporating them and submitted to PMU.

3. Overall Coordination and Implementation

PSC will provide support to the PMU, PIOs and other relevant agencies in the program implementation in accordance with the ToR and ADB Project Administration Manual (PAM). PSC has collaboratively prepared the overall program implementation plan and annual implementation plans in close coordination with PMU and PIOs and presented here. PSC proposes a number of consultative workshops to carry out this task effectively. The required technical and management support to the PMU and PIOs will be provided proactively.

Major Task:	3 Over all Coordination and Implementation
Sub-tasks	
3.1 Support & Coordination to PMU, PIOs and other relevant agencies for output -2 and output -1 for program implementation 3.2 Prepare Program Implementation Plan and Annual Implementation Plan 3.3 Support implementation of the monitoring system 3.4 Support & Coordination with and other relevant agencies (FAO, ICRISAT) for improved agricultural Production	▪ Activities to improve the agricultural productivity ▪ Establish market linkages ▪ Support to agricultural development program ▪ Demonstrate diversified crops system ▪ Provide former training in irrigation technologist 3.5 Technical and Management support to PMU and PIOs

3.1 Support & Coordination to PMU, PIOs and other relevant agencies

The project ensures the well- supported & coordinated involvement of KNNL organizations as Implementation Agencies (IAs), namely Project Management Unit (PMU) will be located within KNNL Bangalore and PIOs will be established within the AC-IWRM which will be responsible for all implementation of IWRM related activities of output-1 and other relevant agencies for program implementation. The PSC will support to the Program Director of KNNL, PMU, steering committee and the program coordinator committee in overall program implementation, administration, coordination and supervision of the Project and meeting the relevant requirements of the PMU for project implementation.

SMEC has nominated total 11 key professionals, who will closely support the consultancy services and ensure that the works are conducted in accordance with the ToR. In addition, other technical experts will be mobilized to provide necessary technical and logistical supports to the key team for successful implementation of the project. The organisation chart is presented in the subsequent Section C.

PSC will initiate a simple and easily manageable approach to support for implementation of the project such as technical, construction management, contract administration, project management, procurement etc. including support to development of a management information system for the program operational performance, operation and maintenance, safeguard and human resource development. In this regard, PSC will coordinate with the PMU, PIOs, KNNL-Client, and State nodal agency, AC- IWRM, WALMI, Karnataka Engineering Research Stations (KERS), other line departments and relevant stakeholders, local authorities, contractors and/or communities. In order to optimise the efforts, PSC will also support & coordinate to enhance close relationship between KNNL, Command Area Development Authority (CADA), WUCSs, other development partners and other concerned agencies working on the project for Output -2 for each irrigation subproject.

3.2 Prepare Program Implementation plan (PIP) and Annual Implementation Plans

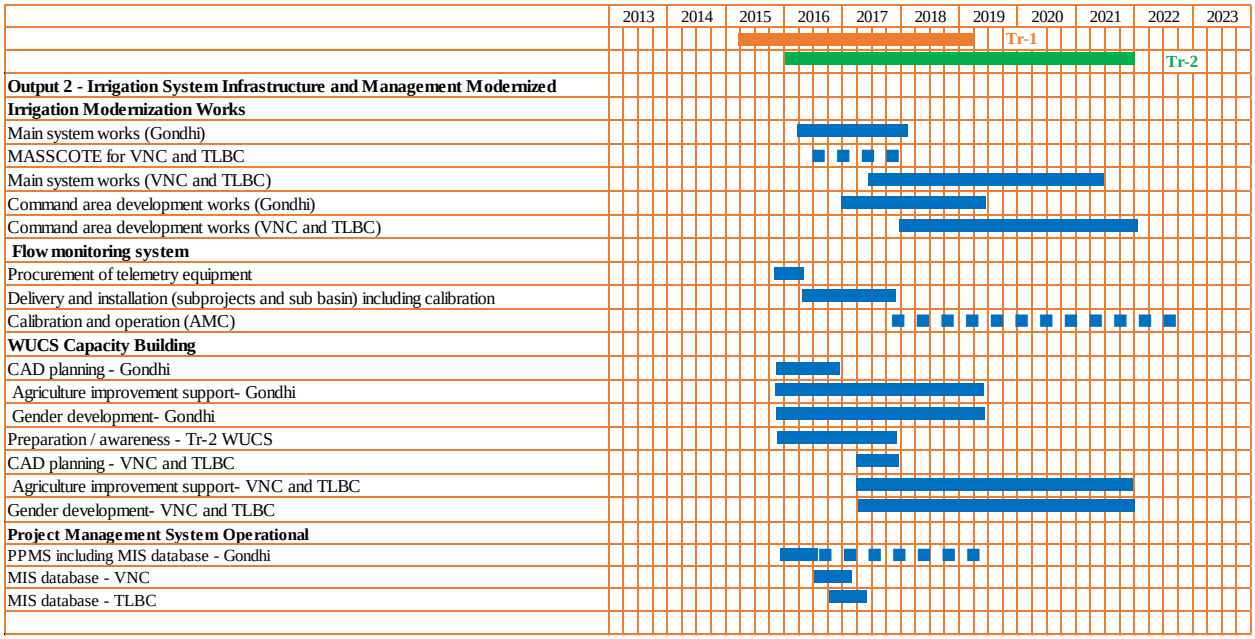
PSC together with PMU has prepared a consolidated Program Implementation Plan and presented in this report. Special consideration will be given to the format of the schedule in order to ensure easy reporting during the implementation of the project. PSC will use Microsoft Project (MS Project) software for this purpose.

During the implementation of specific sub-project and services identified under the IWRM Program, SMEC has ensured that these work plans are prepared in a coordinated way to ensure a consistent reporting structure. On the basis of review findings, PSC will assist the PMU, PIOs on ambiguities, inconsistencies, possible delay causes, bottlenecks and critical path obstacles. This review will enable a proactive time management of the project and eliminate any possible time delay before it occurs instead of remedial project time management

The PIP includes the entire task and developed system tools and processes has been refined and enhanced and incorporated as shown in Table 12. During the Mobilisation Period, in close cooperation with PMU and PIOs and its approval subsequently, PSC has prepared a Program Implementation Plan (PIP). The PIP lists all the tasks/activities and reports for Tranche-1 of the project and planning for Tranche-2.The PIP includes relevant sections of this proposal (such as approach and methodology) updated and expanded according to the outcome of the negotiations leading to the award of the consultancy services contract. PSC has an existing database of project procedures which detail the various quality control measures which may be adopted for the project activities. The Key professional of the PSC will cover aspects such as:

- Program Monitoring Management System (PMMS)
- Technical training, Procurement, financial management, project management procedure and communication policy
- Safeguard Policies and procedures
- Procurement Strategy Development
- Establish a Program Delivery Plan including how the different stages of sub- project will be managed e.g., milestones, gateway approvals etc.
- Capacity building of KNNL, PMU and PIOs for human resources, environment, gender and social safeguard
- Develop monitoring indicators for equitable delivery of irrigation water utilising the flow monitoring system which will be implemented under this project.
- Establish all monitoring tools, key performance indicators and all indicator / performance management tools and the reporting systems that will govern the progress of the Program and set alerts, trends analyses and escalation methodologies and change management
- Stakeholder Communication strategy

Table 12: Overall program implementation plan for outputs 2 and 3



3.3 Support to implementation of the monitoring system

SMEC will support to PMU, PIOs and other relevant agencies in program implementation monitoring system. Monitoring of progress will be based on the detailed work schedule accepted by the KNNL in accordance with approved schedule. The progress report will include charts and graphs as indicators of physical as well as financial progress. Quarterly progress reports will outline the outcomes of the progress monitoring exercise and related analyses and will include the following:

- Name of work, Activities/task involved
- Duration
- Targets date
- Completion date
- Progress
- Agencies involved
- Overall progress
- Officers responsible for the coordination (KNNL, CADA, AC-IWRM , NGOs and other relevant agencies)
- Contact details
- Training monitoring & evaluation ,
- Irrigation water utilising the flow monitoring system.

3.4 Support & Coordination with and other relevant agencies (FAO, ICRISAT) for improved agricultural Production

Activities to improve the agricultural productivity

PSC will support & coordinate with other implementing agencies who will implement the program such as FAO and ICRISAT. To increase agriculture productivity, proper capacity development and training which is applicable as per government policy and what is required to ensure the

adoption of advance agricultural productivity technique. A detailed approach and methodology has been given earlier under Section "Agriculture Development".

Establish market linkages

PSC will facilitate in training to establishing market linkages through WUCs SST, such as Productive Agriculture Linkages and Marketing Systems (PALMS) program pools appropriate technologies and resources together to facilitate weeds, vegetable and fruit supply chain with proper and strengthened organizational capacities and linkages for sustainable production and marketing both local and export.

Support to agricultural development program

The purpose of IWRM is to bring in efficiency of water use and enhancing the productivity. PSC will assist the CADA and SST support field agricultural activities to improved agricultural productivity in Kharif & Rabi crops, crop diversification, promote conjunctive water use, introduction of HYV, adopt IPM, and conduct periodic soil tests. PSC team will be monitoring national and state level agriculture related support programs, and assist the farmers with new high yielding seed varieties.

Demonstrate diversified crops system and rice intensification system

As mentioned in Section "Agriculture Development" earlier, SMEC will also coordinate training to famers, WUCSs, PMU and PIO on diversified cropping pattern aimed at improved soil structure and conserve soil moisture. Diversification can also soften impacts on environmental resources, spread farmers' economic risk, exploit profitable niche markets, create new industries based on agriculture, strengthening rural communities, and aid the domestic economy, enabling producers to grow crops that would otherwise be imported. Diversified cropping systems broaden the source of a farmer's food and income, increases their land productivity, and minimizes unpredictable risks such as the build-up of pest and diseases common in rice monoculture

PSC will assist CADA and WUCS SST for System of Rice Intensification (SRI), especially during the Kharif season. SRI is a methodology aimed at increasing the yield of rice produced in farming. It is a low water, labor intensive, organic method that uses younger seedlings singly spaced and typically hand weeded with special tools and SRI will claim its use increases yield, saves water, reduces production costs during the kharif season and increases income and that benefits will be achieved in Gondi subproject area.

Provide farmers training in irrigation technologies

WUCS will be trained with recent irrigation technologies in irrigation as the part of the capacity building of the assignment. The training may include the study tour to some of success stories in irrigation in the state or other states.

3.5 Technical and Management support to PMU and PIOs

PSC will provide technical and management support to PMU and PIOs in procurement strategy and bid documents, advance procurement action, the review, assessment and selection of various consultants, improving agricultures production, preparing feasibility studies. Technical & management assistance would also be provided to PMU and PIOs for defining the contract conditions for better understanding and preparing of better documentation for effective implementation of the projects.

Bid Document and reports will be reviewed for suitability and modification required in the Tranche -1 contracts. This will include:

- General Conditions of Contract and Special Conditions of Contract
- Technical Specifications

- Management support
- Improved agricultural techniques
- Participatory irrigation management techniques
- Irrigation water utilising the flow monitoring system
- Construction technique & contract administration
- Project progress monitoring
- Implementation of social and environment safeguards in Gondhi implementation

4. Capacity Building

PSC will identify the training requirements and conduct trainings to augment the capacities of the PMU, PIOs, CADA, WUCSs and related agencies to enhance the technical and managerial expertise leading to successful achievement of the Program outputs. Training on MIS will be provided to the project staff. Training and capacity building plan covering all aspects will be developed to meet the Program requirements.

Major Task:	**4. Capacity Building**
Sub-tasks	
4.1 Furnish technical training in ADB procurement, financial management and project management to PMU, PIOs - Provide ongoing support in Project Management - Provide training for Project Procurement Activities to PIOs, PMU - Develop Project Financial Management System 4.2 Provide training in ADB communications policy and safeguard procedures 4.3 Prepare subproject implantation guidelines, manuals, PIOs and training to PMU, PIOs and other staff 4.4 Identify capacity building & training need program to human resource need , gender and other social & environmental safeguard aspects *4.5* Review capacity development plan (and further need assessment)	4.6 Support with PIOs and others for participatory irrigation management and improved O&M - Participatory Irrigation Management - Improved O&M - Training to Project Staff and WUCS on O&M 4.7 Prepare training manual for WUCSs technical training & capacity building in construction technique - Process Planning - Program Designing - Project Implementation - Operation and Maintenance - Monitoring - Evaluation and Learning - Training 4.8 Prepare implementation guidelines to Gender Action Plan(GAP) for women's participation in KISWRMIP 4.9 Prepare relevant implementation guidelines, safeguard documents for resettlement

Capacity Building Approach

A detailed approach for capacity building is already given in Section "Capacity Building". PSC is aware that the scope of services is not only to assist with implementation of the project but more importantly to develop the in-house capacity of the executive agency, relevant agencies and stakeholders. The real success of the project does not only rely on achieving desired improvements but also establishing the capacity in PMU, PIOs and KNNL to maintain and further advance these benefits after the consulting services are completed.

To achieve this, PSC will develop and deliver a well-planned training program, manuals, guidelines and procedures which will include formal training components, workshops, on-the-job training and study tours. On-the-job training is the most effective way of transferring knowledge and skills to the agencies and PSC through continuous cooperation with the nominated staff. PSC will include the agencies' staff in development of solutions and decision-making processes in relation to each task.

SMEC will carry out a technical training program for PMU, PIOs staff on project implementation, ADB procurement, financial management and project management, reporting, PMMS and related ADB and Government rules, regulations and policies. SMEC will also provide training in capacity building, human resources, environmental, gender and social safeguard. Training will be conducted in four formats:

- Formal classroom training
- On-the-job training
- Workshops
- Study tours

Training and technology transfer is an important component of the project. SMEC has got extensive experience in providing on-the-job, formal classroom type training and overseas training to similar projects and similar socio-cultural regions. The methodology described herein is based on this experience and on the information provided in the TOR and Training Flow chart in Figure 6.

Formal Classroom Trainings

PSC will arrange and prepare a formal classroom training plan in consultation with PMU, PIOs and AC- and IWRM for staff of relevant departments and agencies. PSC will discuss with the agencies during preparation of the training program and will agree on the following aspects of the formal training:

- **Topics** to be covered;
- **Course participants** – This includes grades of participants, experience level and the numbers;
- **Objectives of the course** – These will be stated in behavioural or performance-related terms such as what the participants will be able to do at the end of the course;
- Assumed knowledge of participants;
- **The educational approach** – derived from the nature of course participants and their assumed knowledge of the topics to be covered. The section will indicate whether the format of the course is a lecture, group discussions, case study, role play or a mix of these and other approaches;
- **Limiting factors** – This section identifies the time and resources available for the course, the times of availability of participants who may be from different organisations and also any possible constraints in the availability of training facilities; and

- **Time allocation**

On-the-job Training

On-the-job training (OJT) will be lightly tailored to the needs of the staff member in the project office. It is envisaged that a large proportion of the training will be in the form of real world OJT in which staff member and consultants develop a mentor type relationship. Within the mentor system learning-by-doing is the primary method of development and the expansion and mastery of competencies and skills can be carefully managed and monitored.

A range of creative training materials will be produced to facilitate the OJT process to ensure it provides an interesting and varied experience for trainee. The training Program developed will be well-structured though largely on-the-job and so of an informal nature. It will nevertheless be constantly monitored and evaluated.

Workshops

PSC will organise workshop in the line of respective agencies for ADB procurement, financial management to PMU, PIOs. The number of training, venue, participants and other issues will be settled after discussion with Client. The TOR includes a provisional sum for workshops and seminars which assumes approximately every quarter workshops. PSC proposes to discuss the number of workshops during preparation of the training program.

Our range of workshops will equip staff across the board with the technical, operational and implementation skills required within the organisation whilst on-the-job training will offer a flexible approach to tailor and fine tune the skills of staff in particular roles or with particular responsibilities. The success of the training program, however, lies in the implementation of practical skills acquired by the staff and their ability to utilise these skills in the implementation of the project. Consequent to the training program, trained staff should disseminate these skills to other staff across the agency, imitating the mentoring type relationship offered by the Consultant during the project.

As a part of capacity building of PIO, the one-day training workshop on the “Construction Management and Quality Control” was organised at Shimoga on 27.02.2016. The main topics covered in the workshop were:

- Importance and monitoring of quality assurance
- Quality Control and Testing Mechanisms
- Monitoring of the Third Party quality assurance
- Importance and monitoring of environmental and social safeguards

The methodology of the workshop was using PowerPoint presentation of past experiences of SMEC and relating to the Gondhi context. The workshop was more interactive in its approach and was attended by both male and female officers of the KNNL and CADA and the Gondhi modernisation contractor (Plate 11).

Participants of the workshop

CE & PIO officer advising the participants to take active participation in the workshop

CADA Administrator briefing importance of the workshop

PIO Superintendent Engineer emphasizing the relevance of the workshop

PSC Environmental Specialist discussing environmental safeguards

PSC PIM Specialist discussing social safeguards

PSC Construction Management Specialist discussing quality assurance

PSC TL/Irrigation Specialist explaining the role of PSC with regard to quality control

Plate 11: Construction management and quality control training workshop

The participants were given the training materials and certificate of participation in the workshop. They were requested to fill up the feedback form on various aspects of the workshop including suggestions on topic for next training program.

Figure 13: Potential training activities

An important step prior to preparation of the training program is to perform a Training Needs Assessment (TNA). The TNA will take the form of structured, small group interviews at the following levels:

- Representatives from the PMU, PIOs and KNNL
- Representatives from CADA, AC-IWRM, SST, other relevant agencies and stakeholders
- Staff to be addressed in the training program

Information will be collected, not only on perceived current training needs, but also future training needs to enable staff to plan and implement the project components. PSC will employ a gap analysis to verify training needs, and to identify other "non-training" organisational requirements which are considered necessary to assist the relevant department to move towards improving its technical capacity and efficiency in implementing and managing the Projects. The TNA is likely to reveal other issues and possible barriers to the implementation of new policies and/or frameworks. These barriers may include an insufficient structure or number of staff, the organisation of tasks and delivery mechanisms or other organisational hurdles. Once identified, these barriers can be discussed and appropriate methods of resolution found.

PSC identifies training needs as falling into three categories:

- **Position-related needs** arise when a person with a given professional or skill background is appointed to a position that requires interface with other institutions or individuals;

- **Skill-related needs** relate to the improvement of skills, for example in sub-project evaluation activities;
- **Assignment-related needs** arise when a person employed is deputed to carry out any project specific tasks.

Our approach recognises these differing types of need and also the fact that training needs can be both technical and non-technical in nature.

4.1 Furnish technical training in ADB procurement, financial management and project to PMU, PIOs

As mentioned earlier in Technical Approach Section on Civil Works Procurement, the Training Program in ADB procurement, financial management will directly address the identified gaps and barriers to build capacity within the relevant department, ensuring the successful implementation and ongoing operation of the project components. PSC acknowledges that the training program cannot be entirely generic as different staff roles require different skill sets. We will therefore match our training program with the required skills and needs of specific roles where deemed necessary.

Provide on-going support in Project Management

Throughout the assignment, PSC will furnish training to PMU, PIOs staff on project management & communication of the project and ensuring all the systems and tools are being implemented. This support will be in a co-worker and mentoring relation which will enable further development of the PMU, PIOs in project management.

In addition, the PSC will provide all necessary support, training to the PMU, PIOs in communicating with the High Level Policy Coordination Committee and Implementation Committee, various concerned ministries and government departments as needed, PIOs, ADB, CADA and all other relevant stakeholders as well as provide technical input to AC- IWRM on PIM and WUCs.

Provide training for Project Procurement Activities to PIOs, PMU

PSC will provide on-the-job training to the PMU, PIOs and KNNL in preparing procedures and guidelines, if required, for procurement of services, works and equipment. The procurement procedure and guideline will follow the ADB guidelines and will take into consideration the requirements of State Government of Karnataka (SGoK). PSC will facilitate training to each IAs, WUCS, contractors, field staff and other relevant stakeholders in preparing Procurement Plan on Gondi subprojects for goods/ equipments, works and services following rules of ADB and SGoK. This is currently a prerequisite for getting fund from any donors and government. During implementation, the Procurement Plan will be strictly followed that will ensure financial accountability, transparency and progress as per ADB and SGoK requirements.

Project Financial Management System

SMEC will provide training to PMU and PIOs to develop a project financial management and control system which will incorporate the project accounting procedures, cash flow processes, and ledgers.

4.2 Provide training in ADB communications policy and safeguard procedures

An important objective of SMEC is to provide and implement a 'Training Program' on ADB communication policy and safeguard procedure. PSC will provide on-the-job training in ADB communication policy in best practice, along with more formal classroom sessions to identified PMU, PIOs, AC-IWRM staff and WUCs. This will cover activities related to ADB safeguarded procedures such as social, gender and environmental.

Relevance of the training is extremely important for successful implementation of any project. Capacity of staff is created to use the system and inculcate its inclusion in day to day implementation of project activities. The training will cover ADB Communication policy 2011 such as the policy is to enhance stakeholders' trust in and ability to engage with ADB. The policy recognizes the right of people to seek, receive, and impart information about ADB operations. It will support knowledge sharing and enables participatory development to two-way communications with affected people. ADB must seek the views of its borrowers and clients, partners, and other stakeholders, and keep them abreast of its activities .A two-way flow of information between ADB and its stakeholders is crucial to building mutual understanding and trust, which form the foundation of solid partnerships. Transparency about its projects and activities is essential for ADB to gain buy-in from its stakeholders, which is fundamental to the success of a project.

In addition, PSC will provide all necessary support to the PMU, PIOs and SST in audience and best communicating mediums, designing, maintaining existing website and distribution of Program newsletter, pamphlets and other training documents with the High Level Policy Coordination Committee and Implementation Committee, various concerned ministries and government departments as needed, PIO, SSTs, ADB, and all other relevant stakeholders. PSC will also facilitate to the PMU/PIO on-going communication monitoring system

The policy is based on a presumption in favour of disclosure unless there is a compelling reason for nondisclosure. It commits ADB to disclose institutional, financial, and project-related

ADB Safeguard Policy Statement (SPS), 2009 on the environment, involuntary resettlement and indigenous peoples brings them into one single policy that enhances consistency and coherence. The training will address SPS aims to promote sustainability of project outcomes by protecting the environment and people from projects' potential adverse impacts by avoiding adverse impacts of projects on the environment and affected people, where possible; minimizing, mitigating, and/or compensating for adverse project impacts on the environment and affected people when avoidance is not possible; and helping borrowers/clients to strengthen their safeguard systems and develop the capacity to manage environmental and social risks.

4.3 Prepare subproject implementation guidelines, manuals, PIOs and training to PMU, PIOs and other staff

PSC will prepare a consolidated implementation guidelines and procedure and appraisal manual during the early phases of the project. Special consideration will be given to the format of the Guideline in order to ensure easy reporting during the implementation of the project. PSC will use appropriate project procedure and software like Microsoft Project for this purpose. PSC will also agree with PMU, PIOs at the inception phase on the task outline of the project implementation guideline procedures and manuals. The Consolidated Implementation procedure / guidelines will include such as procurement plan for equipment, materials, civil works and packaging contracts and technical services will be prepared for all required contracts. The requirement for international, national or local level bidding process will be ascertained, based on the review on the skill and capacity assessment of contracting agencies and gender and other social and environmental safeguard features. In this regard, PSC will provide training to the PMU , PIOs and other relevant staff to gender and social and in all traits of procedures and manual .this procedures and guideline will be able to support monitor progress both in physical and financial terms.

During the implementation of specific sub-projects and services identified under the Gondi project, PSC will ensure that these procedure and guidelines are prepared in a coordinated way to ensure a consistent reporting structure. On the basis of review finding, SMEC will advise the PMU, PIOs on ambiguities, inconsistencies, possible delay causes, bottlenecks and critical path obstacles.

This review will enable a proactive time management of the project and eliminate any possible time delay before it occurs instead of remedial project time management

4.4 Identify capacity building & training need program to human resource, gender and other social & environmental safeguard aspects

Provide Capacity Building and Training in Environmental/Social Management

SMEC will arrange and conduct long term training programs for KNNL, WRD, CADA, and WUCs / other relevant agencies and other stakeholders on environmental considerations during feasibility study and review of DPR and environmental management during construction and operation. Environmental training will form part of the environmental monitoring and evaluation system. The training will be directed towards all personnel for general environmental awareness.

The key objective of training program is to ensure that the requirements of the IEEs/ EMP are clearly understood and followed throughout the project. The training to the staff will help in communicating environmental strategies and measures specified in the IEEs / EIAs and EMP.

The training and capacity building methodology described above will be followed for this component as well. In addition to the methodical training, PSC will assist PMU in oversight of the environmental management to monitor that:

- The Government's and ADB's safeguard policies on environment are adequately complied at construction sites;
- EMPs are implemented during construction period;
- In case of unexpected environmental impacts during project implementation period, remedial actions to handle such impacts are taken; and
- A reporting system on implementation of EMP is developed and reports are prepared for the ADB and IAs.

PSC will also guide project implementing agencies and ensure that satisfactory institutional arrangements and staffing/ skills are available for the above tasks and outcomes.

The training program will pay full attention to all gender and other social and environmental safeguards aspects, in accordance with ADB and government's policies. ADB's environmental safeguards aims to ensure the environmental soundness and sustainability of projects, and to support the integration of environmental considerations into the project decision-making process. The Safeguard Policy Statement (SPS) requires borrowers to identify project impacts and assess their significance; examine alternatives; and prepare, implement, and monitor environmental management plans. The SPS requires borrowers to consult people likely to be affected by the project and disclose relevant information in a timely manner and in a form and in languages understandable to those being consulted.

Similarly, the National Environment Policy (NEP) 2006 is intended to mainstream environmental concerns in all development activities. The dominant theme of this policy is that while conservation of environmental resources is necessary to secure livelihoods and well-being of all, the most secure basis for conservation is to ensure that people dependent on particular resources obtain better livelihoods from the fact of conservation, than from degradation of the resource. In line with NEP objectives, the KNNL vision is to be environmentally sensitive provider of a quality, reliable and reasonably participatory irrigation management water management and other irrigation system services PSC will provide training on the following activities;

- Review and updating of Safeguard Documents
- Resettlement Frameworks (RF);
- Resettlement Plan (RP) for Tranche-1;

- IEE / EIAs and Environmental Management Plan (EMP) for Tranche -1;
- Environmental Assessment & Review Framework (EARF)- Tranche - 2
- Preparation and Implementation of IEEs / EIAs and EMPs, - Tranche - 2

Human Resources

PSC will provide training to KNNL, WRD, CADA and other relevant agencies on Human Resource Strategy of the existing institutional and operational procedures which does not compliment fully with the desired/required levels considering the spread of the activities/assets being managed by the PMU vis-à-vis the staffing levels and the skills available within the staff. PSC will maintain the desired level of resources and skill sets during the contract period.

In addition, PSC will provide training to KNNL and other relevant agencies to have proper resource plan in place to monitor changes in works, modifications, change in scope or scheduling issues both from other consultants and contractors.

The training will include also the new organisational structure that will:

- monitor development and implementation of any plan to address to the consultant from the delivery of the Program
- ensure any development of new business processes and procedures should be properly documented as a part of overall design process
- monitor any development of policy changes, procedures, forms, staffing, job descriptions, remuneration, organisation structure and responsibilities, training, checklists, development of new metrics etc

For human resource development (HRD), PSC will carry out the following tasks in assisting and in conjunction with KNNL. These will be carried out in conjunction with other training tasks.

Develop policies and procedures

- Clarify HRD's mission, role, core functions and structures;
- Align human resource practices with the service delivery needs of KNNL , CADA and WRD
- Develop and promote strong partnerships with line operations;
- Develop and promote a strong partnership with other relevant stakeholders in order to assess, develop, and implement career development and training programs;
- Assess present and future staffing credentials, competencies, staffing and training needs, and proactively develop programs to address those needs;
- Promote and continuously improve service to internal and external customers.

Develop the organization structure

- Understanding its future business objectives;
- Review of Best Practices/Industry Perspective;
- Development of the design principles and structure options including detailing the preferred option;
- Define staffing plan for the defined structure with options for staffing like external recruitment as per staffing requirements;
- Make recommendations for improvements in manpower planning and assist in the preparation of revised manpower plans in accordance with these recommendations;
- Draw out a detailed training plan by conduct a preliminary training needs analysis by interview with specific management and employees plan focusing on:

- Business Needs;
- Functional Needs
- Change Agenda;
- Capacity building needs for sustained support to the change agenda.

4.5 Review Capacity development plan (and further needs assessment)

PSC will assist and review PMU's in capacity development and training plan in improving its financial and operational management. The Consultancy services in this task will comprise the benchmarking the level of skills and competence and development of Capacity Development Plan. PSC will introduce a process for benchmarking of level of skills and competence of the PMU, PIOs personnel to improve their performance and support to KNNL in developing capacity development plan so that it will be used in advanced practices by irrigation water service providers in addition planning support to CADA.

SMEC's experience suggests that without stronger capacity and institutional reforms, improvements in performance as well as progress toward key national development objectives will be difficult to achieve and impossible to sustain. Priority areas include training, recruitment practices, planning, awareness building, organizational reforms etc. Followings are the Key Priorities and Progress Indicators for Improving Capacity Building Financial Management Performance.

- Capacity building plan
- Periodic Financial request appraisal
- Monitoring and Evaluation
- Corporate Governance

Further Training Needs Assessment

PSC will plan and design further training programs based on reviewing capacity development plan for PMU, PIOs, other implementing agencies: KNNL, CADA and WRD in relating to the other relevant agencies and respective subprojects as shown in Figure 6. PSC will manage and conduct these training programs. Regarding the respective subprojects under each relevant agency, SMEC will provide further continuous training and guidance to the PMU and PIOs of IAs in subprojects aspects such as:

- Formulation of subprojects
- Project Management/ administration
- Participatory irrigation management
- Financial Management
- Environmental, Gender and other Social Safeguards
- Human Resource Management

4.6 Support with PIOs and others for participatory irrigation management and improved O&M

Participatory Irrigation Management

PSC will support PIOs and other implementation agencies for Participatory Irrigation Management (PIM) technique for improving irrigation management along with sustainability of the system. Irrigation systems need to be restructured to make water management efficient. However increasing demand of water in all sectors including irrigation made it imperative that the efficiency of the Irrigation Water Management must be increased. The National Water Policy, State Water

Policy and ADB Policy lay emphasis on participatory irrigation management to be adopted as an essential strategy for improving the performance of sub- projects and therefore farmers should be involved progressively from the grass root level particularly in water distribution & canal maintenance.

In participatory irrigation management, the designated group moderators still have (or has) the final responsibility for making decisions and answering for them, but members of the group who are affected by those decisions are actively sought to provide observations, analysis, suggestions and recommendations in the decision making process.

The role of PSC will be to support PIOs including (CADA & SST) in PIM as the community mobilizer to ensure that the community members objectively and accurately assess and appraise their own community, cataloguing its various problems and how to improve PIM techniques. Some of the important functions are given below:

- To prepare cropping Program considering the soil and agro climatic condition with due regards to crop diversification.
- To prepare a plan for the maintenance of irrigation system in the area of its operation at the end of each crop season and carryout the maintenance works with the occasional funds of the other sources or generated from water services fee from time to time.
- To regulate the use of water among the various small canal outlets under the area of its operation according to the schedule of the system.
- To promote economy in the use of water allocated
- Prepare training documents on technical aspect for project management and information system and participatory irrigation management system

Even more important, encouraging them to participate and improve their self-confidence and motivates them in contributing to their community development. In the process of carrying them out, it is important to remember that community members are learning new skills, and ensure that PSC is transparent in his work. The skills needed by community members to carry out an appraisal are not sophisticated and difficult. Community members are normally and usually willing to engage in the process and will easily learn the skills in the process. Our job is to facilitate that learning. The participation of community members in making a community appraisal goes farther beyond laying the groundwork for community action. The result of their assessments can be used as a base line or data for measuring progress, and therefore as an element of community based monitoring and evaluation.

Operation and Maintenance

As detailed earlier in Technical Approach Section on Operation and Maintenance, the operation & maintenance (O&M) and management will be key activity that will be the responsibility of the WUCs in the long run. The development and implementation of O&M plan and its management will be shouldered by the PIOs, CADA and SST. In this context, the WUCS has to be built in carrying out the O&M and through all stages of the O&M. The WUCS will be facilitated in identification of the role identification within itself, with the PIOs, CADA and the Line agencies. These roles will be defined and delegated among the WUCs members and monitored periodically to examine the effectiveness and the success rate of the delegated activity. The O&M will also include the grievance redresser procedure that has to be handled by the WUCs on behalf of the general community and the farmer groups. The WUCS will represent all the grievances of the farmer groups with the PIOs, CADA and the line agencies and get the solutions for problems that affect the service delivery or the productivity at the farmer level.

Preparing Subproject O&M Plan

PSC will assist the development and implementation of Sub-project O&M plan and provide to the KNNL, CADA. The WUCs will need effective and economic services required for their farmers and access to business agricultural market establishments. The WUCS will also be facilitated by ensuring proper protection and maintenance of the other construction activities for the existing works or facilities including normal operations, routine and preventive maintenance. PSC will also develop detailed responsibilities including operation plans for WUCs through the SST.

PSC will ensure that existing sub-project Operations and Management Plan is incorporated and managed through KNNL, CADA and WUCs.

The Subproject O&M Plan will address:

- Maximum availability for utilization of the movable and non-movable equipment other activities for project implementation and subsequently;
- Review existing subproject maintenance plan and has to prepare for subprojects specific maintenance plan and responsibilities of KNNL, CADA and the WUCs
- Develop robust operational practices for participatory irrigation operation
- Develop broad operating guidelines based on PPTA will prepare as framework for sub project specific operational manual
- Reliable annual budgeting and whole life cost forecasting of movable and non-movable asset maintenance costs;
- Optimum residual value, where appropriate, of the movable and non-movable assets at the time of disposal.

Training to Project Staff and WUCS on O&M and SST

PSC will conduct training to WUCS on O&M and SST project Operation and Maintenance. The procedures for subproject implementation, and operation and maintenance (O&M), shall be as set for the Construction and Management of existing subproject.

4.7 Prepare training manual for WUCS technical training & capacity building in construction techniques

The objective of this task is to carry out capacity building in construction technique of the WUCS to conduct them independently after the subproject is handed over to WUCSs. The WUCSs will be trained to carry out all the activities at the field level and the institutional level. The training will not only be conducted to the WUCS's present members, but also to selected farmer groups that could be potential WUCS members from the community in the long run. The various sub-tasks that will be included under the technical training and capacity building in construction techniques are detailed in the sub-tasks below. This task and the sub-tasks will elaborate on the various operational issues that the WUCS is responsible and

Process Planning

The foremost activity of the WUCS operation will be planning its activities and the processes to be adopted in conducting the WUCs, it's functioning and enlisting of all the construction activities that the WUCs has to undertake under its jurisdiction, the relationship management between the WUCS and the WRD, PMU, PIOs – project level, Canal command level. Further, to this the WUCS will be trained to carryout it's functioning effectively through all these stages. Modules will be developed as part of the training to train the WUCS in all the processes of its functioning and in follow-up process of its activities.

Program Designing

The WUCS will be capacity build to design its program, which includes identification of the key issues such consecution such as RFI, payments billing, BOQs and delays and other social and environmental monitoring aspects , the activities at all stages, the procedure and manual of each activity and coordination structure of the WUCS with the PMU, PIO, KNNL and the other line agencies that are responsible for effective functioning of the WUCS. Further, the activities of all the line agencies will also be enlisted that influence better cropping patterns, agricultural diversification and productivity at the farmer level.

Project Implementation

On identification of the procedures, designing and manual of the program for the WUCS functioning, the WUCS will be trained to implementation all the construction techniques designed for its operations. The project implementation is the most difficult and the important aspect of the WUCS success and effectiveness in improving the service deliver and increasing productivity. The adoption of each activity, and conducting each activity along with the WUCS to introduce to the new construction technique planned, related training and reveal its successes the SMEC's Project team will examine these activities in the beginning stages of the implementation which will be taken over by the WUCS.

Operation and Maintenance

PSC will facilitate to WUCS training program for the operation and maintenance (O&M) will be key activity that will be the responsibility of the WUCS in the long run. The total O&M will be shouldered by the KNNL, PIOs to the WUCS. In this context the WUCs has to be built in carrying out the O&M and through all stages of the O&M. The WUCS will be facilitated in identification of the role identification within itself, with the WRD and the Line agencies. These roles will be defined and delegated among the WUCS members and monitored periodically to examine the effectiveness and the success rate of the delegated activity. The O&M will also include the grievance address procedure that has to be handled by the WUCS on behalf of the general community and the farmer groups. The WUCS will represent all the grievances of the farmer groups with the WRD and the line agencies and get the solutions for problems that affect the service delivery or the productivity at the farmer level.

Monitoring

In order to examine the effectiveness of the activities that are being carried out by the WUCS members a monitoring procedure will be developed. Communication specialist will facilitate to develop training material in self-monitoring of the WUCS, CADA, and KNNL, and provide for appropriate and timely corrective action at every stage of its operation. Various monitoring indicators will be developed, this will include practical and effective monitoring and evaluation system for performance benchmarking of WUCS that reflect on PIM and O&M activities as well as monitoring the Physical progress and operation of the system within the jurisdiction of the WUCS; secondly, the Financial in-flow and out-flow of funds from the PMU, KNNL to the WUCS and its expenses; thirdly, the service delivery improvement due to the WUCs intervention; fourthly, the impact on the productivity of the farmers at each of the WUCS level, and finally, Gender and other Social impact of the project development and the positive effect of the WUCS intervention. There could be some more indicators that would be identified during the project execution by SMEC Team which will be incorporated accordingly. Participation at all stages will be encouraged under the project. The advantages of participation in monitoring include: (a) a common undertaking, (b) enhancing accountability, (c) better decisions, (d) performance improvement, (e) improved design, and (f) more information.

Evaluation and Learning

Evaluation is a process of judging value on what a project or Program has achieved particularly in relation to activities planned and overall objectives. Evaluation is important to identify the constraints or bottlenecks that hinder the project in achieving its objectives. PSC will assist to organize visits for WUCS to other farmers to exchange learning and experience and to relevant institutions Solutions to the constraints can then be identified and implemented.

In order to address the field level issues an evaluation criterion will be developed. This criterion will enable the WUCS members to take corrective action and monitor its own members based on these evaluation criteria. The various activities and the processes will be evaluated based on this criterion. The evaluation will be carried out for a few of the indicators presented below:

- Implementation performance in relation to objectives
- Impediments to the achievement of the objectives
- Intended and unintended effects on various social components
- Evaluation of the entire implementation program
- Extent of success with respect to the indicators
- Evaluation of indicators as the quality of life of the farmers and the farmer groups

In addition to the program and project evaluation, the various lessons learnt will be documented for future utilisation in similar situations or projects. These will be documented as case studies on good practices. Further, specific monitoring for future benefit evaluation will also be developed.

Training

Agricultural specialist and other specialist to develop and test " experience based training " methods The training to the WUCS will include both class room and field level sessions; this will be carried out to cover:

- Management support program
- Technical support program
- Technology transfer
- Participatory Approaches
- Coordinate and organize attendance for workshops and seminars as required for the consultant and client agency project teams

Further, identification of institutions within the state, across other states in India and any available international project where PMU, PIOs, KNNL, CADA personnel can be provided exposure and capacity enhancement trips will be carried.

Feedback on training and performance evaluation for each program conducted will be carried out to improve upon the training that is being conducted periodically at the WUCs level.

4.8 Prepare implementation guidelines for Gender Action Plan(GAP) in KISWRMIP

SMEC will prepare implementation guidelines to Gender Action Plan (GAP) for woman. ADB's gender and development policy identified gender mainstreaming as a key strategy for addressing gender equity in all ADB financed activities. Gender (woman) assessments demonstrate that project gender action plans (GAPs) are effective gender mainstreaming tools. Loan projects implementing quality GAPs result in: increased participation in KISWRMIP by women in loan activities, particularly through community-based organizations; It also results in more equitable access to project and program resources including skills training, technology, and government

services as well as improved practical benefits for women such as increased income, greater financial security, and more livelihood options.

The Initial Poverty and social Analysis by ADB has categorized the proposed investment as Effective Gender Mainstreaming (EGM) where Gender Equality and Women's Empowerment (GEWE) is substantially integrated but not an explicit outcome for Water Resource Management. The program will directly support GEWE. We will undertake all tasks mentioned in ToR to ensure compliance with the ADB's policies on gender and social inclusion.

4.9 Prepare relevant implementation guidelines, safeguard documents for resettlement

As outlined in the Technical Approach Section on "Social and Environmental Safeguards", PSC will prepared the Social Management Framework and IEE/EIA as necessary for Tranche -2 subprojects and will support to PMU, CADA, WUCS and other relevant agencies wherever possible (i) to avoid resettlement; (ii) to minimize involuntary resettlement by exploring project and design alternatives; (iii) to enhance, or at least restore, the livelihoods of all displaced persons in real terms relative to the pre-project levels; and (iv) to improve the standards of living of the displaced poor and other vulnerable groups.

The ADB safeguard policy reflects the recognition that unless properly managed, people and communities displaced by development projects can suffer severe economic, social, and environmental distress, including the loss of their housing, productive lands, income sources and livelihoods as well as social tensions and diminished cultural identity. The vulnerable group and poor are more likely to be disproportionally affected, resulting in long-term hardship and impoverishment. In this regard, SMEC will monitor the compliance of safeguard requirements during the Gondhi modernisation implementation.

5. Subproject Development

Assistance with subproject development will require collection, collation, and analysis of a wide range of data and extensive interaction with key stakeholders. To achieve this in a timely manner, we will prepare and implement an action plan for each sub-project. The reconnaissance visits will be undertaken to the Krishna basin and specifically within the area K-8 or Tungabhadra sub-basin area to get a first-hand feeling of the region. During these visits, even field level offices of PIO /PMU and other line departments will be covered for discussion on implementation of different components.

Major Task:	**5. Subproject Development**
Sub-tasks	
5.1 Prepare feasibility study and support to DPRs for Tranche -2 irrigation 5.2 Review packaging contact, bidding documents for Tranche-2	5.3 Support for quality control and construction management / contract administration for Gondi irrigation subprojects 5.4 Construction Management, Monitoring and Training

5.1 Prepare feasibilities studies and support to DPRs for Tranche -2 irrigation

As described earlier in Technical Approach Section on "Feasibility Studies of VNC and TLBC", or each modernisation subproject, a participatory feasibility study and necessary due diligence will be prepared, covering technical design, economic and financial viability, institutional arrangements, social assessments including social safeguards plans as applicable, environmental analysis, and an implementation plan.

Building on the detailed project reports prepared by KNNL, SMEC will review these DPRs for Tranche-2 irrigation subprojects with regard to the compliance of information required by the ADB guidelines. PSC will prepare any necessary analysis and reports on the technical, financial, economic, legal, institutional, and safeguards Social Management Framework and Gender Action Plan for Tranche- 2 sub- projects (social, environmental, gender, etc.).

5.2 Review contact packages, bidding documents for Tranche-2

PSC will assist and review packaging and contract documents for Tranche -2 sub projects, and preparation of contract documents. The final documents shall be initialled by the Contractor's authorised representative and KNNL and shall be bound into a single document

PSC understand that KNNL and PMU intends using its e-procurement system as acceptable to ADB. SMEC has extensive experience on the use of e-procurement on similar investment programs and will be able to successfully assist the KNNL in this regard. Further, all procurement shall follow ADB's Procurement Guidelines and bidding documents for the works shall be based on ADB's standard bidding documents. However, if the recommended form of contract packaging is outside of the current catalogue of ADB standard bidding documents, PSC will propose alternative forms of contract for KNNL and ADB's consideration and approval.

PSC will compare the advantages and disadvantages of bid document procurement methods for Tranche-2 and will recommend the most appropriate method for each subproject. Procurement may be by either single stage or two stage bidding as considered appropriate once the content of contract packaging Tranche-2 has been determined.

PSC will review the proposed works in bid documents so that all bidders can compete on an equal basis. However, in order to allow for the latest technological developments, the bidders may be allowed to submit alternative bids based on their own proposed designs to meet the specified performance requirements. We will assist and review the KNNL throughout the bidding process for all works and operation contracts from bidding document preparation and prequalification through to the completion of contract negotiations and award.

PSC will assist the IAs and stakeholder organisations (PMU, PIOs, KNNL, and CADA) in preparing standards and specifications for equipments to be prepared by PMU on their account. IAs will send design, standard and specification for the equipments to the PMU, KNNL and PSC will assist PMU, KNNL in preparing all bid documents required for their respective equipment purchase, and assist them in all procurement related activities on these packages such as modernization works and finalised tender documents issuing bid invitation, receipt, evaluation, approval of bids and award of contracts, etc, as per ADB procedures for Tranche-2 subprojects. In principle, tender documents shall be prepared in a manner and to such detail that ensure the pricing, and subsequent construction by qualified contractor/s and without any ambiguity or misinterpretation.

The tender documents shall include, but will not be limited to:

- General and special technical specifications;
- Bills of Quantity detailing all the components of the works and all items of equipment, supplies and installation;
- Drawings as necessary;
- General Conditions of Contract, Particular Conditions of Contract, Form of Contract and Form of Tender;
- Pre-Qualification Notice and questionnaire for prospective contractors; and
- Instructions to Tenderers

SMEC will refer to the following documents in preparing the procurement documents:

- Handbook for Procurement under ADB loan;
- ADB procurement guidelines
- Standard Pre-qualification Documents under ADB Loans (Procurement of Work and Equipment);
- Standard Bidding Documents under ADB Guideline;

PSC will also review the current administration process for the calling, bidding and award of bids with a particular view on the procurement process and will propose suitable countermeasures for improvement of the system, if any. The evaluation committee will evaluate the bids and will prepare and submit to the Client a comprehensive draft Bid Evaluation and Recommendation within the period stated in the Implementation Schedule.

During the bidding phase, PSC will provide assistance to IAs particularly as follows:

- assist IA to conduct pre-bid conferences, and site inspection for interested contractors;
- prepare for approval and issue by IA any necessary revision or addenda to the bid documents during the bid period;
- assist in the opening of the bids, tabulation and evaluation of the bids received and prepare recommendations for contract awards;
- assist IA in contract negotiations with the contractors if necessary,
- prepare standard forms and reporting formats to be used during construction;
- prepare and compile all documents for a complete construction contract for the approval of IA.

PSC will support the PIOs during the construction phases such as construction management, construction monitoring of Gondi irrigation subprojects. PSC will oversee the performance of the construction supervision and will provide guidance for performing their activities in accordance with their contracts and in an internationally acceptable way. PSC will promptly notify for any required correction and will also advise the PMU/ PIO on such required actions. PSC support will include the following activities:

- Development of a Quality Management System;
- Reviewing Contractors' quality control procedures and advise, if necessary, where improvements may be incorporated;
- Approving construction techniques and plants after determining that they are able to produce the required quantity and quality of work to maintain contractors' stated program. Each contractor will be asked to provide performance specifications of equipment that impact on the Works quality
- Random checking of materials sources and random testing of materials and prefabricated components to confirm compliance, and to carry out retests where necessary;
- Ensuring that quality control certificates are provided with any materials or components sourced from outside suppliers;
- Random checking of setting out, and the position and dimensions of elements of the works, to confirm compliance with the specified tolerances and all other aspects that affect the quality of the Works; and
- Implementing a random re-check and re-examination program on a statistical basis.
- Physical and financial progress monitoring of the contracts

PSC will review and assist the comprehensive Program provided by the contractors, consideration for tests for approval; this system of tests check will be checked through Request for Inspection (RFIs) issued by contractors as specified by PSC.

Further PSC will review and monitor the construction progress on monthly basis and review technical memorandum, details of meetings and decisions taken, periodic compliance reports which will include all work activities, status of clearances, progress schedule and reason for any delay and along with their recommendation through monthly reports and deliver to the PMU, KNNL.

5.3 Construction Management, Monitoring and Training

For successfully implementing the subprojects, PSC will assist the PIOs in developing and implementing a Project Monitoring Plan, Construction Management Manual and structured QA/QC plan. PSC will provide necessary training to the project staff and contractors in latest construction techniques including use of project management software. PSC will also provide training to WUCS on construction methods and operation and maintenance.

5.4 Support for quality control and construction management / contract administration for Gondi irrigation subprojects

The requirement to ensure high levels of quality control (QC) on the project cannot be overstated. We assume that the Conditions of Contract will require the Contractors to develop and implement a Quality control (QC) Manual. One of our major Sub-tasks will be to review and support the Contractor's QC plans and ensure consistency across each of the contractors for Gondi Subprojects. We will closely assist for monitor the quality of materials and workmanship to ensure strict compliance with the provisions of the respective construction contract. We will apply / support vigorous QC for this Sub- project with a commitment to using environmentally, Gender, socially and financially sustainable solutions

PSC intend to assist a System Based Method of controlling construction, works quality, measurement and monthly payment. This will include requests to perform work; inspection of the Work and the testing of materials; and measurement of satisfactorily performed work.

PSC will support to PMU and PIOs use as appropriate contract administration procedure for various sub-projects to be implemented under the investment program. We will assist PMU in selecting the most appropriate type of contract and procurement method for Gondi irrigation sub-project. Following the award of a works contract, we will assist the PMU with the administration of the contract.

PSC will administer the construction contracts in accordance with the TOR and the requirements of the respective contracts. The Contract administration will involve closely monitoring the contract performance to ensure compliance and fulfilment of the contract conditions. It will also include contract maintenance and change control, time and cost monitoring, ordering and payment procedures, management reporting, and so on.

6. Program Monitoring Management Systems (PMMS)

PSC has extensive experience in supporting the ADB funded projects in development and implementation of Program Performance Monitoring System (PPMS) including environmental monitoring, MIS database development, and M&E.

Major Task:	6. Program Monitoring Management System
Sub-tasks	
6.1 Supervise the ongoing development MIS Database, Program Performance Monitoring System (PPMS) and analysed 6.2 Assist to PMU for Program monitoring Indicators 6.3 Safeguards Compliance Monitoring, implementation progress and social indicators including impact on poverty reduction	➕ Assist Confirming Preparation of Environmental and Social Assessments and Related Procurement Documents ➕ Establish Safeguard (Environmental & Social) Monitoring indicators System ➕ Provide Capacity Building and Training in Environmental/Social Management 6.4 Monitoring & Evaluation and contribute the periodic reports

6.1 Supervise the ongoing development MIS Database, Program Performance Monitoring System (PPMS) and analysed

The project Implementation needs at the PMU, AC- IWRM will be assessed through extensive consultations and discussions with the PIOs and WUCs and the community members. In addition, the management information system (MIS) will also be arranged for specific environmental monitoring data base. The ongoing PMMS will be accordingly designed to address the project implementation needs such as environmental monitoring, optimal approach for data gathering, storage and use for planning and monitoring as the MIS requirements for effective monitoring.

Further, PSC will oversee the ongoing development of MIS database including database for socio-economic and program implementation and data entry to the PMMS. Skill identification will help in this new system that will then be customized to needs and utilisation ease.

SMEC will deploy a MIS specialist who will maintain the PMMS and provide assistance PMU and PIOs & implementing departments in using the PMMS. Online tutorial will be included in the PMMS and online assistance by the PSC which will be made available to PMMS users. SMEC will assist each office for initial data entry and train staff in data entry and PMMS use. PSC will also assist KNNL and implementing agencies in using the PMMS, provide training and develop relevant documentation.

PSC will assist PMU and PIOs in carrying out progress monitoring of the project using specialised techniques and tools. SMEC is aware that the progress monitoring is very important because whether the project implementation is conducted timely and as per plan is only be evaluated by progress monitoring. Therefore, the success of the implementation would greatly depend not only on the monitoring and evaluation (M&E) of the inputs, outputs and outcomes, but also the processes underlying the design and implementation of the respective subprojects. SEMC will design, establish and carry out a sound progress monitoring system for this purpose. In this regard, PSC will review a detailed work plan, design and progress reports and implementation schedule prepared by the KNNL for project monitoring purposes covering all stages of the implementation process for each subproject to ensure effective project monitoring and timely project outputs. PSC will regularly update the consolidated and overall implementation schedule for the Project, recommend ways to accelerate project implementation, assess reasons for delay and identify means for improvement.

The Program Performance Management System (PPMS) to be prepared for data entry under the project will incorporate key performance criteria for PMU that will be developed at the project

inception period. SMEC will assist the PMU in performance evaluation as per the requirements of this performance monitoring system.

As the part of PPMS, PSC is developing the webpage for KNNL main website and uploaded all relevant project documents. This will be installed as the part of the KNNL main website. Any project documents can be uploaded for safe archiving.

6.2 Assist to PMU for monitoring indicators

Monitoring of progress will be based on the detailed work schedule accepted by the IAs at the start of project or any revised approved schedule. The progress report will include charts and graphs as indicators of physical as well as financial progress. Monthly progress reports will outline the outcomes of the progress monitoring exercise and related analyses. In addition, further detailed monitoring on a weekly basis will be carried out at field level that will be conveyed to the Consultant/ Contractors as necessary with recommended measures to cover any delays and lags. In case of activities lying in the critical path, greater emphasis will be placed on meeting planned progress. In such cases, daily monitoring of the progress and decisions on corrective measures including shift works might be necessary. Regular management meetings will be held with PMU (KNNL) and SMEC team to review and update the work program as necessary. PSC will organise the management meetings and will find out the procedure to keep the minutes of the meetings that will include a record of attendees, decisions made and agreements reached.

Contract and project progress must be clearly monitored against these programs. Copies of programs showing activity status and projecting the effect of acceleration or delay will be incorporated into the reporting regime along with graphs of real time versus contract time and various progress graphs. A Project Implementation Progress Monitoring Diagram is shown in Figure 14.

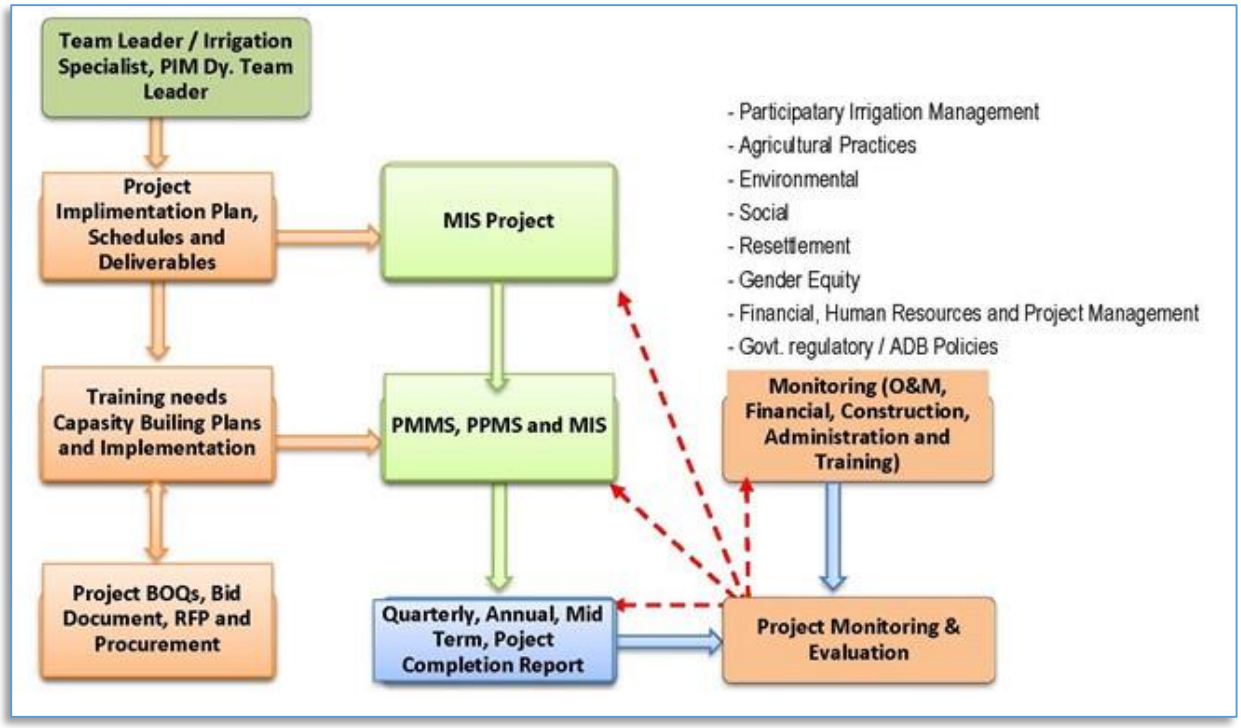


Figure 14: Project Implementation Progress Monitoring Diagram

SMEC's approach is aimed to detect any potential delay early, analyse its effects, investigate possible solutions, report and proactively intervene to keep the project to schedule.

6.3 Safeguards Compliance Monitoring, implementation progress and social indicators including impact on poverty reduction

Assisting in environmental and social safeguard monitoring

PSC will assist the PMU and PIOs to monitor environmental and social safeguards as envisaged in implementation plans and followed in accordance with the Government rules and ADB's safeguard policy requirements during the project implementation. The compliance and plans that will be prepared for each project include:

- Environmental Assessment or Initial Environmental Examinations (IEE)
- Environmental Management Plans (EMPs),
- Prepare Social Management framework and Gender Action plan tranche-2
- Resettlement Action Plans (RPs).

Detailed sub-project specific IEEs, EIAs / EMP and SIAs/ RPs will be prepared by PIOs. SMEC will review these IEEs, EIAs / EMP and SIAs/ RAPs and will provide guidance and assistance to the IAs and PMU and KNNL. The following two steps will be followed for review of EIAs:

1. Review impact significance
2. Attribute impact significance to potential impacts

The impact assessment will be reviewed for all relevant pre-construction, construction, and operation activities of the project. Cumulative impacts will also be considered, in accordance with ADB environmental and social assessment guidelines. Cumulative impacts considered for the project may include:

- Cumulative air, water and noise quality changes to the overall project area
- Cumulative social and economic changes to the overall project area

PSC will assist the positive or negative impacts identified as per above in the IEEs s/IEEs/SIAs, monitoring and collecting data will critically review / assist the mitigation/enhancement measures for those impacts included in the EMP and RP. SMEC has developed numerous mitigation strategies for ADB projects using the following hierarchy of strategies and will use a similar hierarchy for different subprojects under IAs. As per strategies to ‘avoid the impact’ are of highest priority, whilst strategies to ‘compensate for the impact’ are of lowest priority.

PSC will monitor the compliances as per Social Impact Assessments (SIAs), Social Management Plans (SMP) and Resettlement Action Plan (RAP) to ensure follow up of the ADB’s guidelines in order to:

- Minimise the risks and as necessary, mitigate direct and indirect impacts of the project that adversely affect the region;
- Manage and optimise the potential benefits and ensure that, there is an equitable distribution among different social groups; and
- Build the capacity of IAs and GOK agencies, local authorities and other stakeholders to develop, implement and manage social development strategies.

PSC will review and assist the participatory strategies prepared by KNNL, of respective implementation projects for planning and management of the social impacts and benefits, involving active participation of people directly and indirectly impacted by the project, as well as local authorities, NGOs and other organisations. The social issues of socio-economic impacts, gender, ethnicity, poverty and involuntary resettlement are fundamentally linked and the Consultant approach to ensure the identification of strategies based on these linkages, both to mitigate adverse impacts and to optimise the level and distribution of benefits.

PSC will carry out consultation with stakeholders and public on the results of the impact significance assessment and the expected ability to which the mitigation measures will reduce impacts to acceptable levels. PSC will consult with PMU, KNNL and other project team members and public to receive advice on practical methods to incorporate proposed mitigation measures (e.g. contractor specifications, method statements, re-alignment, changes to construction schedules etc).

PSC will review the Resettlement Plans (RP) according to the Government policies, and the ADB's involuntary resettlement for the Project Affected Persons (PAPs) and communities affected by land acquisition. Based on the review, PSC will provide corrective measures in EMP and RP, if necessary for Gondi subprojects under PMU, KNNL and CADA

As part of the assistance in procurement activities, PSC will assist the PMU in confirming whether EMP is included in bidding documents and civil works contracts and also assist in providing oversight on environmental management aspects of the project and ensure EMP is implemented by IAs, PMU, PIOs and CADA, and contractors.

Establish Safeguard (Environmental & Social) Monitoring indicators System

Environmental monitoring during project implementation provides information about key environmental aspects of the project and the effectiveness of mitigation measures. Such information enables the implementing agencies to evaluate the success of mitigation as part of project supervision, and allows corrective action to be taken when needed.

In this regard, the PPMS to be prepared by the PSC will incorporate environmental and social indicators for monitoring that the project is satisfying EMPs and RAPs. And including socio-economic, Program implementation data entry to the PPMS.

PSC will also provide additional inputs in the areas of performance indicators and monitoring mechanisms for environmental components during construction and operational phase of the project. In addition, it will be ensured that implementation and monitoring plan are practicable and applicable as per available resources. Monitoring frequency, locations and standards to be followed should also be clearly defined and/or based on the monitoring the indicators set out in the monitoring plan of the EMP. This will ensure to minimize the conflict between Contractor and proponent during implementation of the Gondi subprojects. It will also be ensured that impacts and their mitigation measures should be considered at all four stages of the project i.e. i) Design Stage ii) Pre-Construction Stage iii) Construction Stage and iv) Post-Construction Stage. PSC will also assist PMU, PIOs in conducting internal monitoring of resettlement process to ensure smooth implementation.

PSC will advise and assist IAs in monitoring the effects of RAP. Monitoring will be a critical process to confirm that former subsistence levels and living standards are re-established and that corrective measures are applied when necessary. The range of activities to be monitored may include:

- land acquisition and transfer
- compensation payments
- construction of replacement houses by displaced households
- Re-establishment of income levels.

PSC will assist in preparation of reports on resettlement activities and monitoring of PAPs in the inception and monthly reports. The type of baseline information that will need to be gathered to assess the resettlement impacts and devise strategies to cope with resettlement includes the following items.

- Number of population and households affected by the project
- Household demographics (number of members, relationship, age, gender, health, literacy and numeracy, education, employment and economic activity)
- Main sources and amount of monthly household income
- Control of household income and access to resources
- Average monthly expenditure (by amount and type of outgoings)
- Type of household structure, tenure, appliances and asset ownership, and levels of indebtedness
- Data related specifically to gender and ethnicity
- Access to electricity and transportation (access and mobility issues).

The range and nature of the parameters will be discussed with IAs. Once the parameters have been approved, collection and recording of the data will allow the changes to be gauged, level of benefits to be recorded and who the actual beneficiaries are to be determined.

Monitor Environmental and Social Compliance

PSC will ensure that all civil works Contractors are following the relevant design and construction standards and guidelines for earthquake resistant structures. SMEC will assist the PMU and PIOs in facilitating and confirming overall compliance with all Government rules and regulations in reviewing, monitoring and evaluating the effectiveness with which the EMP is implemented, and recommend necessary corrective actions to be taken as necessary.

The monitoring plan of the EMP and RP will be regularly updated as per the performance indicators established. SMEC will oversee the project components to ensure that the approved EMP is implemented; recommended necessary actions are taken and will evaluate the effectiveness of the actions taken. This review will be included in the regular progress reports. The Consultant will prepare consolidated quarterly environmental monitoring reports upon receipt of the quarterly reports from IAs. The Consultant will also prepare environmental monitoring reports each year to ADB.

PSC will also assist the PMU, KNNL in ensuring timely disclosure of the final EIA/s IEEs including EMP in locations and form accessible to the public.

PSC will assist in monitor the progress of the land acquisition and advice to KNNL to make sure to IAs that the Land Acquisition activities would be conducted in accordance with “ADB Guidelines for Confirmation of Environmental and Social Considerations.”

PSC will assist the IAs in implementing resettlement plans (RPs) and other social mitigation plans of project components. SEMC will assist PMU, KNNL and IAs by:

- Working in co-ordination with the PMU, PIOs, and KNNL staff.
- Supporting the KNNL identifying Environmental and monitoring actions to mitigate negative impacts and elaborate their cost for including IEEs/ EIA plan for tranche - 2subproject
- Helping to promote good working relationships between the PAPs and PMU, PIOs. This will be achieved through regular meetings with both the PMU and the PAPs during the entire duration of the assignment. All meetings and decisions taken shall be documented by the consultant.
- Preparing monthly action plans with targets in consultation with the PMU, PIOs.
- Assisting the PMU, PIOs in carrying out the implementation of the RPs.

- Updating the database of PAPs and their entitlements.
- In consultation with the PAPs, preparing micro-level plans indicating the categories of entitlement, alternative livelihood options, and relevant institutions for obtaining additional training and support. Women's perceptions are important to be incorporated in the development of these plans.
- Assisting the PMU, PIOs in submitting monitoring reports to ADB that describe the progress of the implementation of resettlement activities and any compliance issues and corrective actions. The report should prominently feature the problems and issues addressed and tackled with the PAPs and the solutions found. The report should have a separate chapter on Gender women's issues, their problems and what has been done (within the framework of the RP) to ensure their participation in decision-making as well as the options made available to them to access economic opportunities, marketing and credit. The report should clearly indicate the number of field visits made by the Consultant staff and the outcome of consultations with people.
- Implementation will be done by SST team and Monitoring of Gender Action Plan for tranche -1 and 2 subproject and will give input for MIS
- Assist the PMU and PIOs in reviewing all technical reports and designs in order to ensure that they are gender sensitive and sensitive to the needs of other vulnerable groups
- Ensure that the PT vehicles, as well as all facilities constructed under the Project, abide by the appropriate standards and regulations for vulnerable groups

6.4 Monitoring & Evaluation and contribute to the periodic reports

The PMMS will be designed to meet specific needs of key stakeholders. It will primarily be required to make day-to-day decisions about work program, monitor key activities related to intervention implementation report and provide systematic information. The monitoring system will be made simple, pragmatic, cost effective and user friendly. Use of computer technology is introduced as it is necessary to ensure online monitoring systems to be effective, efficient and cost effective. The success of the monitoring system is dependent upon the extent to which an IA uses information to improve implementation.

PSC's scope of PMMS, in general, will include four main areas:

- Input monitoring;
- Timely monitoring of implementation processes;
- Measurement of success in meeting the objectives; and
- Measures to ensure stakeholders participation.

As each project needs to develop a monitoring plan that covers all essential aspects of the project. The various stages of the project should be covered in the monitoring plan they are:

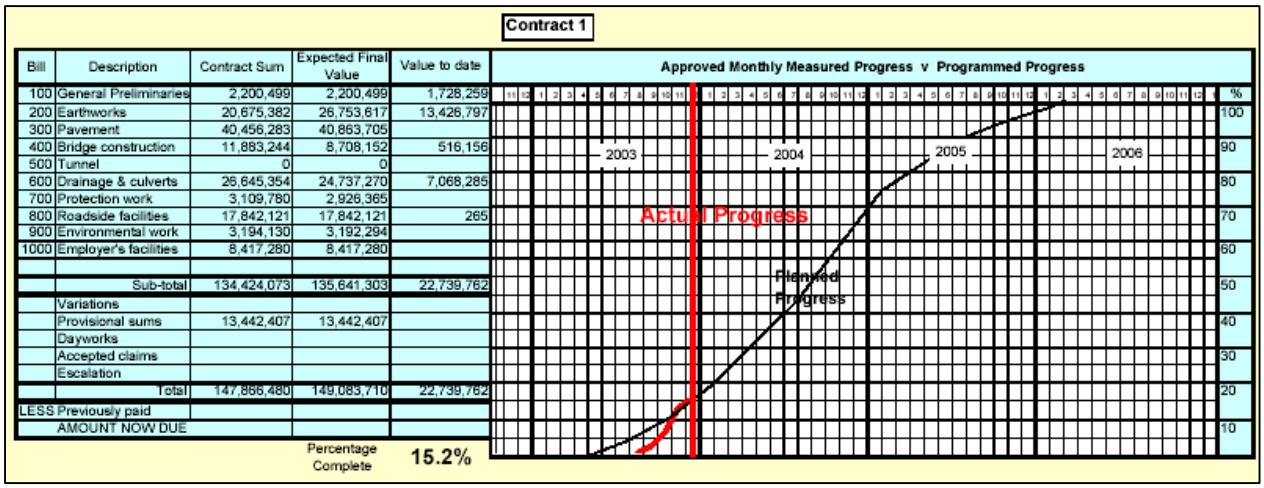
- Preparatory Stage;
- Intervention implementation stage; and
- Post implementation stage.

The key performance indicators that will be utilised for conducting the monitoring will be defined after discussing with PMU and each IAs and the SEMC will use this as the basis for the development of project specific PMMS, if necessary, by adjusting and fine tuning the indicators and targets. Any adjustments will be done in consultation with the ADB and the project implementing agencies (PMU, CADA and AC-IWRM).

PSC will also prepare a review report on its evaluation training and other progress in addition to the regular reporting of project progress, inputs, outputs, and outcomes to the PMU, PIOs, and the ADB task team.

Monitoring of progress will be based on the detailed work schedule accepted by the KNNL, PMU at the start of project or any revised approved schedule. The progress report will include charts and graphs as indicators of physical as well as financial progress. Quarterly progress reports will outline the outcomes of the progress monitoring exercise and related analyses. In addition, further detailed monitoring on a weekly basis will be carried out at field level that will be conveyed to the Consultant/ Contractors as necessary with recommended measures to cover any delays and lags. In case of activities lying in the critical path, greater emphasis will be placed on meeting planned progress. In such cases, daily monitoring of the progress and decisions on corrective measures including shift works might be necessary. Regular management meetings will be held with PMU, and PIOs PSC to review and update the work program as necessary. PSC will organise the management meetings and will find out the procedure to keep the minutes of the meetings that will include a record of attendees, decisions made and agreements reached.

PSC will support to Contractors, PIO, and KNNL to project progress monitoring with preparation of S- curves for physical and financial progress and other monitoring methods must be clearly monitored against these programs. Copies of programs showing activity status and projecting the effect of acceleration or delay will be incorporated into the reporting regime along with graphs of real time versus contract time and various progress graphs. A Sample S-curve Project Physical and Financial Monitoring Chart is shown in Figure 15.



Bill	Description	Contract Sum	Expected Final Value	Value to date
100	General Preliminaries	2,200,499	2,200,499	1,728,259
200	Earthworks	20,675,382	26,753,617	13,426,797
300	Pavement	40,456,283	40,863,705	
400	Bridge construction	11,883,244	8,708,152	516,156
500	Tunnel	0	0	
600	Drainage & culverts	26,645,354	24,737,270	7,068,285
700	Protection work	3,109,780	2,926,365	
800	Roadside facilities	17,842,121	17,842,121	265
900	Environmental work	3,194,130	3,192,294	
1000	Employer's facilities	8,417,280	8,417,280	
	Sub-total	134,424,073	135,641,303	22,739,762
	Variations			
	Provisional sums	13,442,407	13,442,407	
	Dayworks			
	Accepted claims			
	Escalation			
	Total	147,866,480	149,083,710	22,739,762
LESS	Previously paid			
	AMOUNT NOW DUE			

Figure 15: Sample Project S- Curve Physical and Financial Monitoring Chart

7. Assist PMU & PIOs in Physical & Financial Management

Major Task:	7. Assist to PMU & PIOs in Physical & Financial Management
Sub-tasks :	
7.1 Physical & Financial Management - Quarterly progress and financial monitoring - Periodic progress reporting	

7.1 Physical & Financial Management

The PSC will assist PMU to develop a project financial management and control system which will incorporate the project accounting procedures, cash flow processes, and ledgers and will serve two purposes:

- to ensure that the Program can account to the State Government of Karnataka (SGoK) and the financing agencies, in accordance with their procedures and requirements, for the expenditure of all project funds;
- to generate data and information for financial management of the project.

It is essential that separate and accurate records, with full supporting documents, are maintained of all project receipts, expenditures and commitments. These records are required in order to prepare withdrawal applications; to prepare consolidated statements of expenditures, project accounts and financial reports for the SGoK and the donors; and to ensure that the project has the necessary records for financial audit and review by the SGoK and the donors. However the system should not just record receipts and expenditures but should also be capable of generating up-to-date information for use in financial management of the project. Hence, PSC will assist PMU and PIOs in establishing, updating and managing an appropriate Management System.

Quarterly progress and financial monitoring

PSC will prepare and submit the quarterly report to PIOs. The Quarterly report will cover the progress on their: (i) activities; (ii) compliance with safeguard requirements; and (iii) progress toward output targets. The PMU will consolidate these in a quarterly progress report (QPR) that will be finalized and circulated to ADB, WRD and through WRD, to the state IWRM and program steering committees. QPRs will be circulated within one month of the end of the reporting quarter.

Periodic progress reporting

PSC will prepare the periodic monitoring reports and ensure timely and quality deliverables by implementing the quality procedures. We will have an internal monitoring system to ensure that the various elements of the program are on track, and various specialists are performing their functions effectively.

During the course of program implementation, the PPMS will be further fine-tuned as needs are recognized. Project performance monitoring will be undertaken by PD with the support of the PSC. PMU will provide ADB with:

- QPRs in a format consistent with ADB's PPMS;
- consolidated annual reports including
  - (a) progress achieved by output as measured through the indicator's performance targets;
  - (b) key implementation issues and solutions;
  - (c) updated procurement plan; and
  - (d) updated implementation plan for next 12 months.

8. Document / Report to be Submitted

Major Task:	8. Document / Report to be submitted
Sub-tasks :	
8.1 Reporting - Inception Report - Quarterly progress - Annual Reports	- Mid-Term Report - Project completion Report - Feasibility Report
*Outputs/**Due***	- Inception report (draft submitted within 2 months of mobilization and finalized within 3 months of mobilization); - Quarterly progress reports (within 30 days of the end of each quarter) - Annual report (within 30 days of the end of each calendar year) - Mid-term report (middle of year 2 for Project-1) - Project completion reports (draft submitted 3 months prior to tranche-1 completion and finalized within 3 months after tranche-1 completion)

8.1 Content of Reports and schedule of submission with Experts' Input

The Team Leader/ Irrigation Specialist and PIM /DTL will compile the requisite details to prepare the inception report at the end of the second month. The inception report submitted to the PMU, KNNL will have the following details

Inception Report

- Outline of overall methodology to be used
- Work plan, deliverables
- Deployment schedule of key staff
- Training Schedule – output indicators for effectiveness of the training

Time Schedule: Draft report within two months and final report within 3 months of start of the project

Quarterly Reports

PSC will prepare and submit the quarterly report to PMU and PIOs. The Quarterly reports will cover the progress on their: (i) activities; (ii) compliance with safeguard requirements; and (iii) progress toward output targets. The PMU will consolidate these in a quarterly progress report (QPR) that will be finalized and circulated to ADB, WRD and through WRD, to the state IWRM and program steering committees. QPRs will be circulated within one month of the end of the reporting quarter.

ToR provides the list of task which should be monitored on quarterly basis as follows:

- progress on project activities;
- monitoring of compliance (policy, legal, financial, economic, and other covenants)
- safeguard issues (monitoring of social and poverty action plans)
- environmental quality monitoring (as per IEE and EARF)
- gender mainstreaming, monitoring of gender and social dimensions including potential resettlement impacts

- monitoring gender indicators and targets as per Gender Action Plan
- quality of work necessary to ensure sustainable basis
- progress toward output targets

Time Schedule**:** Within 30 days of the end of each quarter

Annual Reports

- Report on work of previous year and cumulatively
- Impact of work done (Case studies, presentations etc.)
- Work expected in next year
- Key issues for attention of PMU, PIOs
- Progress achieved by output as measured through the indicator's performance targets,
- Key implementation issues and solutions;
- Examine the continuing appropriateness of implementation arrangements;
- Examine activity schedules with particular concern for progress towards IWRM targets and institutional strengthening parameters such as capacity building and;
- Construction standards and quality of works implementation;
- Review compliance with agreed procurement procedures;
- Analyze progress and success of capacity building and training programs; and
- Monitor the effectiveness of safeguard procedures.
- Updated procurement plan and
- Updated implementation plan for next 12 months

Time Schedule: Within 30 days of the end of each calendar year

Mid-Term Report

- Identify problems during Tranche -1
- Constraints encountered under Tranche -1
- Report on progress upto mid-term review
- Assessment of need for modification of the tranche-1 scope and future course of action and
- Work expected in remainder of project
- Impact of work done (Case studies, presentations etc.)
- Key issues for attention of PIOs, PMU (including any suggestions for restructuring related to this Consultancy)
- Financing and/or implementation arrangements and implications for tranche- 2

PSC will assist the PIO, PMU during mid-term reviews of the Project. A comprehensive mid-term review will be undertaken within 24 months of loan effectiveness to identify any problems and constraints encountered, and assess any need for modification of the tranche-1 scope and financing and/or implementation arrangements as well as implications for tranche- 2.

Time Schedule: 18th months (middle of year 2 for Tranche-1)

Project Completion Report

- Report on the working of selected Gondi subproject WUCSs , other stakeholders

- Safeguard and quality of work compliance
- Review of implemented activities
- Outcome of training programs
- Contributions by other line depts. and PRIs, regular interaction with PRIs.
- Overall report for Project-1
- Lessons learnt

Time Schedule: Draft report by 3 months prior to tranche-1 completion and final report within 3 months after tranche-1 completion

9. Document / Report to be Submitted

Major Task:	9. Deployment of WUCS Support Service Team (SST) for Gondi Sub-Project
Sub-tasks :	
9.1 Support PMU for deployment of WUCS Support Service Team (SST) for Gondi Sub-Project	

PSC will organise hiring of WUCS Support Service Team (SST) as per the scope given in TOR and norms of ADB and KNNL. Procurement Expert will assist in hiring of services of SST and prepare the draft contract and conduct negotiation. The WUCS Support Service Team (SST) will be integral part of the PSC. The PSC will ensure that the SST services are part of the PIO activities for social mobilization and capacity building of WUCS under Tranche 1 of the Gondi Anicut project in Bhadravati Taluk, Shimoga District.

The WUCS Support Services Team (SST) will be deployed for a period of 36 months for tranche-1 implementation and will be part of the Project Support Consultant (PSC) team. The PSC will deploy a SST which will comprise four members - two Community Organizers (Female and Male), one Water Management Extension Agent and one Agricultural Extension Agent. The total input will be 144 person months for national consultants. The SST will be fluent in Kannada and have prior experience in rural development preferably with water and irrigation issues. Computer literacy and practical experience in using the latest software (MS Office etc) is needed.

One of the objectives of the assignment is to assist the PMU/PIO with the strengthening of Gondi project WUCS by providing training, capacity building and hand holding support to the WUCS. It is expected that the number of SSTs will be expanded for subsequent Tranche 2.

The PSC will provide support and training to the hired SST. The PSC will ensure that SST has sufficient capability to:

- Manage the activities of the SST;
- Provide orientation training to the SST on program activities and implementation arrangements etc; and
- Familiarity in organizational structure of program, clarity in roles and reporting lines.

The institutional strengthening process for WUCS adopted by the project is in four sequential phases implemented over a period of 48 months in Tranche 1:

Phase 1	WUCS Mobilization	(8 Months)
Phase 2	Planning Modernization	(4 Months)
Phase 3	Executing Modernization Plan	(18 Months)
Phase 4	Irrigation Management	(18 Months)

The PMU will detail the process, methods, tools and the results to be achieved in implementation of each of these activities in a program guideline. Based on this the implementation schedule for WUCS institutional strengthening will be prepared with clearly demarcated timeline and milestones. The SST will institutionally strengthen the WUCS adhering to these guidelines following the laid out timelines and milestones.

10. Document / Report to be Submitted

Major Task:	10. Support to PIO and PMU during Periodic Reviews by KNNL and ADB
Sub-tasks :	
10.1	Support to PIO and PMU during Periodic Reviews by KNNL and ADB

Such periodic reports will be submitted to meet the requirement of PMU for loan implementation. We will also keep a record of minutes of meetings with key functionaries so as to identify and follow up actions at higher levels as part of its responsibility to support the PMU. PSC will also play a major role during periodic review by ADB and the Government.

PSC will produce a draft Project Completion Report (PCR) for Tranche -1 /Project -1 three months before its completion. This will be finalized during the last month of the Project after the receipt of comments from Govt. of Karnataka and the ADB received by the start of that final month. The content of PCR will be finalized with the project stakeholders (KNNL and ADB) who will detail the lessons of Project-1 implementation for the guidance of future similar activities.

PCR will be completed within 6 months of physical completion of the Project-1. To ensure projects continue to be both viable and sustainable, project accounts and the executing agency‘s audited financial statements, together with the associated auditor's report, should be adequately reviewed.

It is expected that within 6 months of physical completion of the Project- 1, the KNNL will submit a project completion report to ADB. The PSC will assist the KNNL in finalizing the same. The procedure will be followed for Project-2.

4.4 Work Plan

4.4.1 Introduction

PSC has carefully drawn up a Work Schedule that takes into consideration the nature and objectives of the assignment. The Work Schedule is based on PSC’s understanding of the assignment from the ToR, review of the relevant documents, field visits and discussion with KNNL officers and other stakeholders, its regional experience, and its extensive experience in undertaking similar projects under similar conditions around the world.

PSC has outlined the work plan for the implementation of the main activities/tasks of the assignment, their content and duration, phasing and interrelations, milestones (including interim approvals by the Client), and scheduled delivery dates of the reports.

The consultancy services will be provided over a continuous term of forty-two (42) months. The scope of the services is significant and PSC is of the opinion that it will be important to follow a logically constructed work schedule in order to achieve the project milestones within allotted 42 months and deliver the required deliverables.

4.4.2 Work Schedule

The rationale behind this Work Schedule is to provide KNNL a clear and concise work flow. PSC has prepared a detailed Work Schedule for the assignment (Table 13), which is consistent with the technical approach and methodology described here based on the understanding of the TOR. The reporting milestones are also carefully scheduled and are consistent with the requirements of ToR.

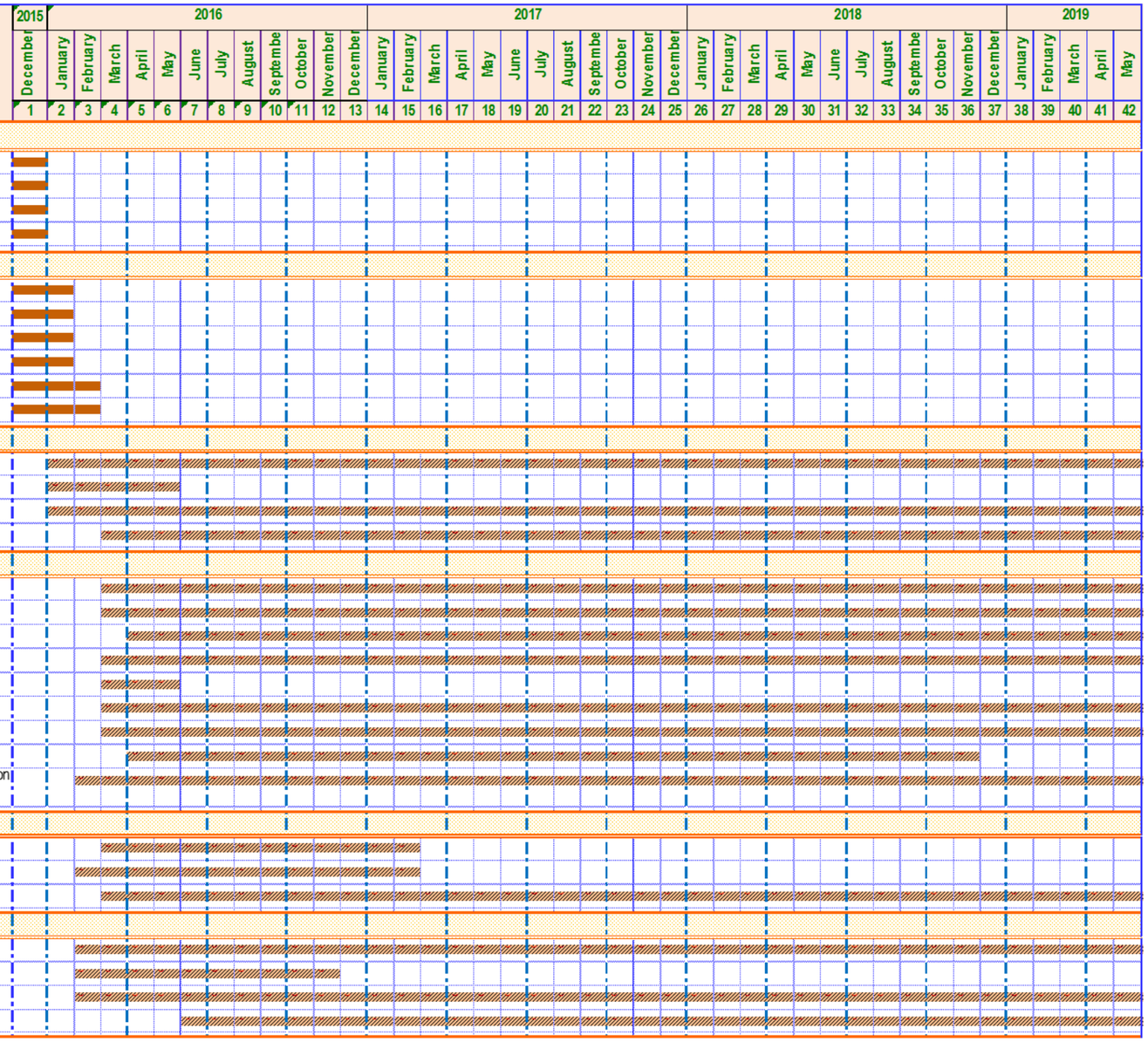
The proposed Work Schedule is based on the following important aspects:

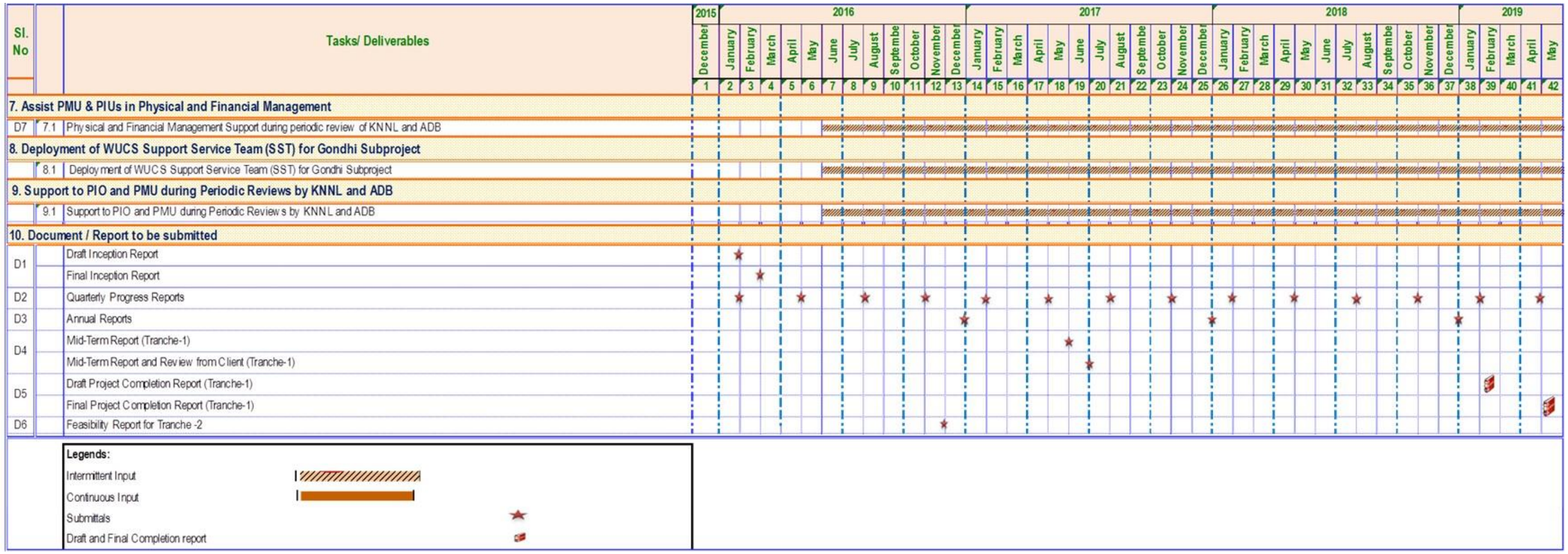
- The assignment duration of 42 months;
- The commencement of the assignment will be with a start-up meeting with the Client;
- The overlapped implementation phase of Tranche 1 and planning for Tranche 2;
- Active stakeholder consultation and participation being the key planning, implementation and management approach for the project, early and sustained commencement of the stakeholder engagement is the key;
- Key points identified for stakeholder consultation and training and workshops, study tours.

These schedules will be reviewed during the initial few weeks of the assignment and an updated and detailed version will be presented in the Inception Report.

Table 13: Work schedule and planning for deliverables

Sl. No		Tasks/ Deliverables
		1. Project Initiation
	1.1	Project Initiation
	1.2	Team Mobilization and Deployment of Staff
	1.3	Start-up Meetings with KNNL Officials to gain understanding of project activities
	1.4	Office Set-up and Logistic arrangement
		2. Preparation of Inception Report
	2.1	Collection of all Project Documents from Client including Tranche -I and Review current Project Activities Team
	2.2	Review of documents and discussion with various project Stakeholders and Reconnaissance Visits to sites
	2.3	Review of Methodology & Work Plan
D1	2.4	Review of Deployment Schedule of Consultant Team
	2.5	Preparation & Presentation of the Inception Report
	2.6	Submission of Inception Report
		3. Overall Coordination and Implementation Support
D2,	3.1	Support & Coordination to PMU, PIOs and other relevant agencies
D3,	3.2	Prepare Programe Implementation Plan (PIP) and Annual Implementation Plans
D4,	3.3	Support implementation of the monitoring system and preparation of periodic reports
D5	3.4	Support & Coordination with other relevant agencies (FAO, ICRISAT) for improved agricultural production
		4. Capacity Building
	4.1	Provide technical training in ADB procurement, financial and project management to PMU and PIOs
	4.2	Provide training in ADB communications policy and safeguard procedures
	4.3	Prepare subproject implementation guidelines & manuals and training to PMU, PIOs and other staff
D2,	4.4	Identify capacity building & training program to human resources, gender and other social & environmental safeguard aspects
D3,	4.5	Review Capacity development plan
D4,	4.6	Support PIOs and others for participatory irrigation management and improved O&M
D5	4.7	Prepare training manual for WUCS technical training & capacity building in construction techniques
	4.8	Prepare implementation guidelines to Gender Action Plan (GAP) for women's participation in KISWRMIP
	4.9	Prepare, implementation guidelines, safeguard documents for resettlement to facilitate implementation by PMU, PIUs and WUCS and preparation of periodic reports
		5. Subproject Development
	5.1	Prepare feasibility studies and support preparation of DPRs for tranche -2 irrigation sub-projects
D6	5.2	Review packaging of contacts and bidding documents for tranche-2 sub-projects
	5.3	Support for quality control and construction management / contract administration for Gondi irrigation subprojects
		6. Programme Monitoring and Management Systems
D2,	6.1	Supervise the ongoing development of MIS Database for Programm Performance Monitoring System (PPMS) and analysis
D3,	6.2	Assist PMU on Programm Monitoring Indicators
D4,	6.3	Safeguards Compliance Monitoring, implementation progress and social indicators including impact on poverty reduction
D5	6.4	Establish Monitoring and Evaluation Indicators and preparation of periodic reports




Sl. No
Tasks/ Deliverables
2015
2016
2017
2018
2019
December January February March April May June July August Septembe October November December January February March April May June July August Septembe October November December January February March April May June July August Septembe October November December January February March April May
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42
7. Assist PMU & PIUs in Physical and Financial Management
D7 7.1 Physical and Financial Management Support during periodic review of KNNL and ADB
8. Deployment of WUCS Support Service Team (SST) for Gondhi Subproject
8.1 Deployment of WUCS Support Service Team (SST) for Gondhi Subproject
9. Support to PIO and PMU during Periodic Reviews by KNNL and ADB
9.1 Support to PIO and PMU during Periodic Reviews by KNNL and ADB
10. Document / Report to be submitted
D1 Draft Inception Report
Final Inception Report
D2 Quarterly Progress Reports
D3 Annual Reports
D4 Mid-Term Report (Tranche-1)
Mid-Term Report and Review from Client (Tranche-1)
D5 Draft Project Completion Report (Tranche-1)
Final Project Completion Report (Tranche-1)
D6 Feasibility Report for Tranche -2
Legends:
Intermittent Input
Continuous Input
Submittals
Draft and Final Completion report

4.4.3 Submission Schedule for Deliverables

The submission of deliverables are planned to meet the objectives of the assignment. Timely Deliverables in the scheduled time will contribute to the KNNL's effort to steer the project in right direction. Apart from these deliverables, there may be thematic and sectoral reports on specific tasks depending on the requirement of project and the client. These will be submitted to facilitate the project progress and decision making of both the Client and the Consultant as the need of the project activities. The schedules of key deliverables/ outputs are given in Table 14.

Table 14: Submission schedule for deliverables

#	Reports/Deliverables	Descriptions	Timing (from Start)
D01	Inception Report (Draft)	Outline of overall methodology to be used Work plan, deliverables Deployment schedule of key staff Training Schedule – output indicators for effectiveness of the training	Within 2 months of mobilization
	Inception Report (Final)		Within 3 months of mobilization
D02	Quarterly progress reports	Progress on Activities (Training, manual, safeguards, financial and procurement) compliance with safeguard requirements; and Progress toward output targets.	Within 30 days of the end of each quarter
D03	Annual report -1 Annual report -2 Annual report -3 Annual report -4	Report on work of previous year and cumulatively Impact of work done (Case studies, presentations etc.) Work expected in next year Key issues for attention of PMU, PIOs	Within 30 days of the end of **each calendar year**
D04	Midterm report	Report on progress upto mid-term review Work expected in remainder of project Impact of work done (Case studies, presentations etc.) Key issues for attention of PIOs, PMU (including any suggestions for restructuring related to this Consultancy)	18th months (middle of year 2 for Project-1)

#	Reports/Deliverables	Descriptions	Timing (from Start)
D05	Project completion report (draft)	Report on the working of selected Gondi irrigation project WUCs , other stakeholders the adherence to prescribed procedures and processes, content of discussions, the decisions made Review of implemented Programs and activities Benefit flow to targeted members and training Contributions by other line depts. and PRIs, regular interaction with PRIs. Overall report for Project Lessons learnt	39 months (3 months prior to Tranche-1 completion)
	Project completion report (Final)		42 months
D06	Feasibility Report	Feasibility Report	12 months

The Consultant will submit 10 copies along with soft copy of all final reports to the Client as per schedule. In addition, PSC will also submit the adequate number of copies of draft reports. Regarding PMMS Manual, PSC will submit 30 copies along with soft copy. The Manual will also be available online on the PMMS. PSC will submit the periodic progress reports to PMU based on loan implementation. Annual workshops will be organised to discuss findings, recommendations and provide trainings.

4.5 Project Organisation and Staffing

4.5.1 Project Organisation

PSC has given significant consideration to the staffing for the assignment and have nominated a highly experienced Team Leader, other team members and support staff. SMEC's highly developed project management systems will ensure that the team functions as an integrated unit and works effectively with the Client to deliver a successful project. The scheduling of the key experts and other expert inputs have been carried out to optimise the resources available and to facilitate the transfer of technical skills to counterpart staff.

Figure 16 shows the project organisation for this project. It clearly demonstrates that SMEC's Team has adequate technical, project management and logistic supports when these are required, guaranteeing almost fool-proof mechanism against the poor project performance.

Where SMEC India provides all management support including mobilisation of the national project staff, SMEC International Australia supports the mobilisation of international project staff. Local project office in Shimoga assists with the logistics and local staff. SMEC has also large backstopping technical resources across various operations around the globe that can be mobilised to support any skill gap in the SMEC's Project Team.

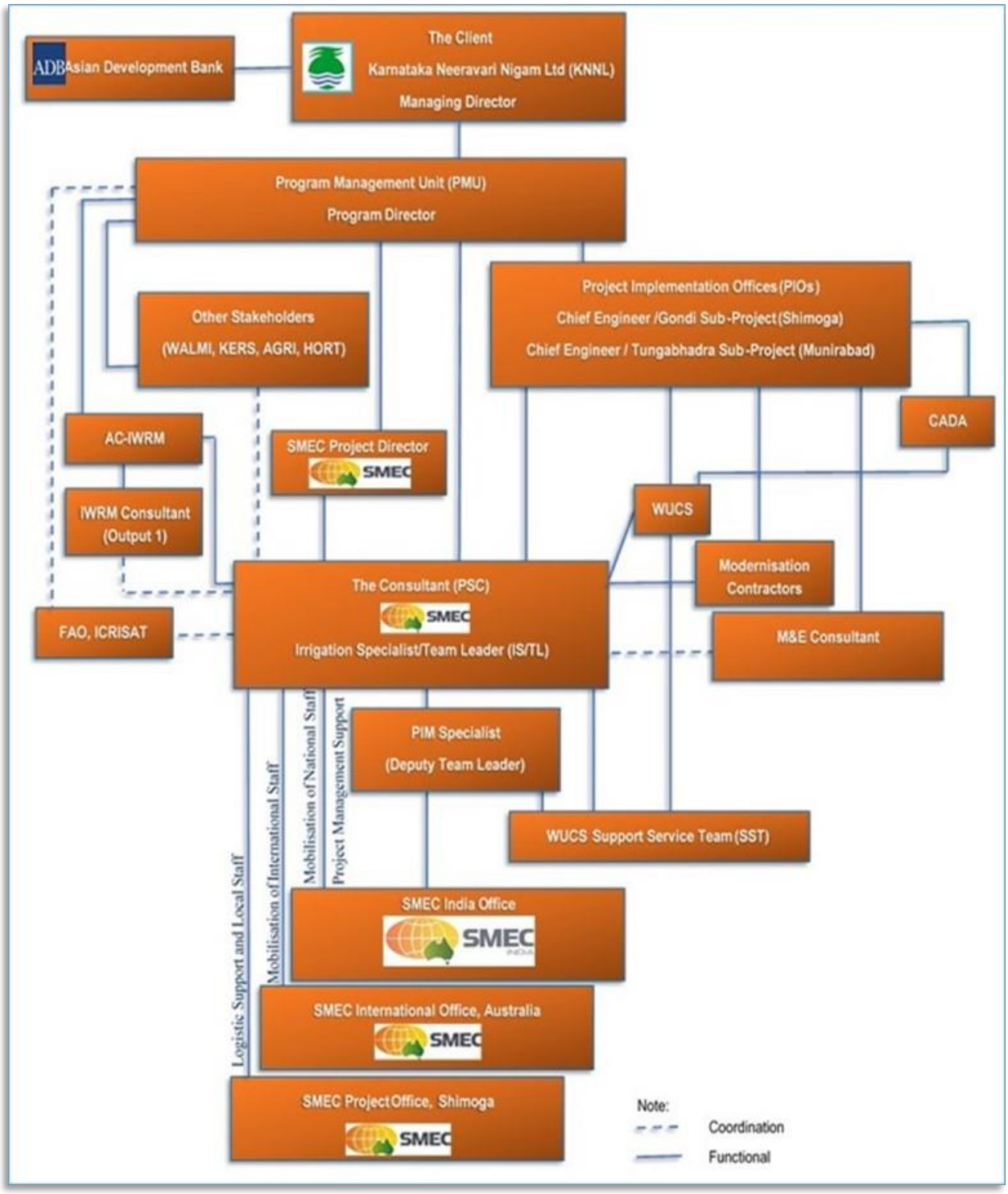


Figure 16: Project organisation for PSC

4.5.2 Home Office Support

The Head offices of SMEC International and SMEC India would extend all support to the key experts and project office staff stationed at Shimoga for carrying out all major and minor activities, so that the quality outputs are delivered to the client well within the time frame. The technical, managerial and financial support would always be provided for smooth and timely delivery of reports. The staff at SMEC India from its head office will provide backstopping technical,

administrative and IT support to the key and support staff team members. In addition to the above support, SMEC would also extend the conceptual support for the development of PMMS through experiences from similar projects implemented worldwide in the past.

4.5.3 Project Management Support

The Project Management unit headed by Functional Manager of Water, Environment and Social Group at SMEC India, who will act as Project Director, will regularly guide and support the SMEC's project team to strengthen its delivery and also monitor and review the progress of the deliverables under the assignment. SMEC will also ensure the deployment of consultant team members as per the proposed schedule so that the services are delivered as per requirements. The Project Director from head office will liaison with the Client and get independent feedback about the Experts' input and establish close liaison with the client. SMEC will periodically discuss with the Client to get feedback to take mid-course correction, if any.

4.5.3.1 Client Liaison from Head office

The Project Management team from head office will also liaison periodically with the Client and get independent feedback from the Client about the Experts' input. In addition to the above, SMEC Bangalore Office will also extend the necessary logistics and administrative support to the Project Team. SMEC will also have a direct liaison with the Client offices at KNNL head office and Division office at Shimoga.

4.5.3.2 Client Liaison from Local office

The SMEC has a regional presence in Karnataka with a Branch office located in Bangalore and is headed by the Branch Manager, who will look after the liaison with the client and will extend the full support to the Consultant Project team members for successful completion of the project. He will also establish close coordination with the KNNL head office and Division office at Shimoga.

4.5.3.3 Quality Management Procedure (QMS) Support

The Quality Management System will be established in the project so as to follow the quality procedures during the consultancy services. SMEC is an ISO certified company and follows the QMS procedure to control quality of its services to the clients.

SMEC will adopt an integrated approach whereby all team members are made fully aware of their roles and responsibilities, both with respect to the individual works and also the project as a whole. SMEC will ensure all team members are given a comprehensive induction to the project, and will hold periodic team meetings and workshops to ensure strong internal communications and knowledge sharing.

SMEC is committed to implementing quality management in all corporate activities and on projects undertaken on behalf of clients, and to this end operates under a quality management, environmental management, safety management and risk management system which satisfies the requirements of ISO 9001:2000, ISO 14001:2004, AS 4801:2001 and AS 4360:2004. SMEC is certified as a "Quality Endorsed Company" with SAI Global on certificate number QEC0655.

SMEC will implement quality assurance on all activities undertaken on the Project. Project management and quality management systems will be established and used so that each team

member clearly knows and understands their responsibilities and duties and has the means to undertake them in a satisfactory manner.

SMEC will monitor and control the project through the following processes:

- Quality management system providing basic guidelines for quality assurance and control;
- Quality assurance audits to ensure procedures are followed and documented;
- Project management plan and time schedules with project-specific details;
- Liaison meetings with the Employer and other stakeholders;
- Project reports submitted as specified;
- Program which is updated and submitted with monthly reports and quarterly reports;
- Project management through proven procedures.

The Project Plan and timeline schedules will enable the SMEC and the Client to monitor the progress of the work at all stages of PSC. SMEC will encourage the interaction and communication between the team members and its management for effective project management.

To ensure the Client's requirements are incorporated into project outputs, Project Performance Management System (PPMS) will be prepared in accordance with the quality management system. The system will outline how the various tasks and components in the project will be managed, and the quality procedures to be implemented during project execution. The system will include a PPMS, including procedures for incoming and outgoing documents, and establishment of a filing system and the action taken on incoming correspondence.

As a part of its quality procedures, SMEC will identify potential project risks within all work phases and will detail out the measures to manage these risks. Given the complex nature of this project, this undertaking will be an essential component of SMEC's overall approach to providing the Client with the level of protection it needs to safeguard its interests. SMEC has extensive experience in applying this approach successfully on similar projects, both internationally and in developing countries.

4.5.4 Project Staffing

In determining the team composition we have fully complied with the requirements/guidelines provided in the ToR issued to us. The team for PSC consultancy consists of three categories of staff:

A. Key Professional Staff

B. Non-key Technical Staff, and

C. Administrative Staff.

SMEC will deliver the services using Key Experts and Other staffs, and deploy adequate technical support staff and administrative support staff to the key experts (Figure 17). All proposed key experts have got required qualifications and adequate experience in their respective field to deliver the tasks assigned under this assignment. All experts have demonstrated high involvement to ensure the quality and timely delivery of services.

The key professional team consists of 11 Key professionals as suggested in ToR. The key professional team is a core group, and will be assisted by other professionals. The core group comprises of the Irrigation Specialist / Team Leader, PIM Specialist (Deputy Team Leader), Operation & Maintenance Specialist, Water Institutions Specialist, Agriculture Specialist,

Environment Specialist, Social Development & Gender Specialist, Construction Management Specialists, Communication Specialist, MIS Specialist and Procurement Specialist.

The members of the core group will collectively handle the responsibility of ensuring quality and timely delivery of services. In line with the requirement, team of key experts having substantial international and local experience in integrated water resources management (IWRM) have been proposed. The language proficiency of some of the key experts in Kannada has also been considered to ensure effective communications during stakeholder consultations and training Programs. Required key and other staff proposed in the team are fluent in both spoken and written English and possess computer usage skills with some having Kannada language capabilities at a working level. The experts who are expected to provide state-of-the-art inputs in key areas of the assignment have substantial relevant experience in externally aided funded by ADB and World Bank including overseas projects in India, South Asia and elsewhere.

PMMS design and development team supported by MIS / IT support staff to take up PMMS development while key experts will provide domain understanding.

In addition to the experts, SMEC will also deploy necessary administrative staff like Office Manager, Bi-linguistic Translator and computer operators to support all the logistical and administrative requirements. SMEC will work in close co-ordination/consultation with PIO and PMU of KNNL, Nodal Officers of relevant agencies /departments during the project period.

Considering ToR's emphasis on IWRM, Team Leader and Deputy Team Leader and the other key experts who have worked extensively on IWRM projects, SMEC have proposed them to be part of this current assignment.

In addition, hiring of WUCS Service Support Team (SST) consisting of 4 members is underway by PSC. This SST will take up the activities for WUCS under Tranche -1 during the contract period which will be implemented in four sequential phases. The CV's for SST Team are being collected through the contacts in relevant local institutions. The applicants will be interviewed in order to assess their suitability for the relevant positions, and submitted for PMU's approval.

The PSC Services involve significant project financial and economic analyses, particularly with VNC and TLBC that will require the inputs of a good **Project Economist**. However, there is no designated such position in the project team. In this regard, SMEC proposed that four months input of Water Institutions Specialist can be reduced and the same man months be utilised for input of Project Economist. SMEC was advised to prepare the Terms of Reference for the Project Economist and submit the same to PMU for necessary approval.

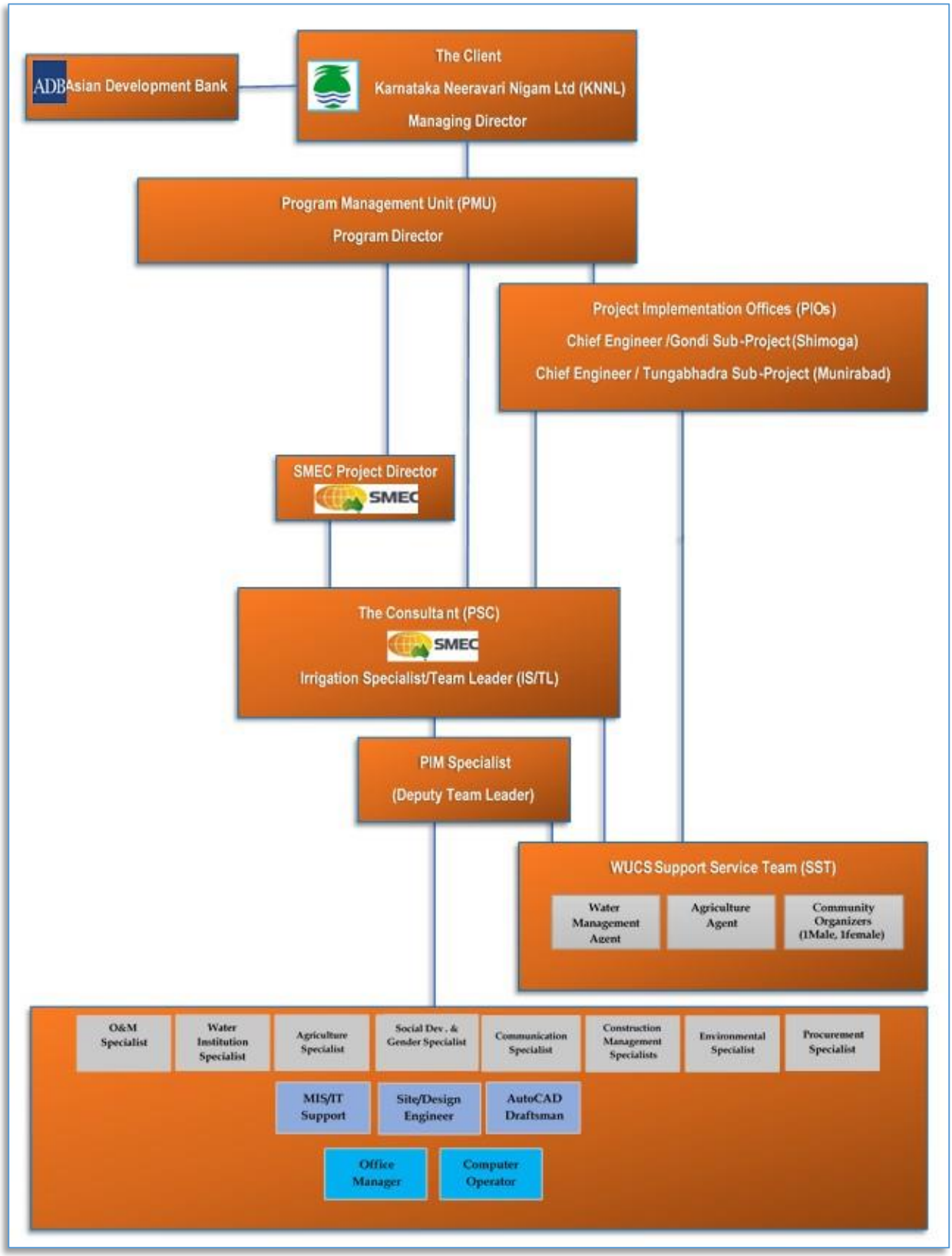


Figure 17: Project staffing for PSC services

4.5.5 Project Staffing Schedule

The scheduling of international and national experts inputs has been proposed to optimise the resources available and facilitate the transfer of technical skills to the counterpart staff (Table 15). The schedule is consistent with the work schedule, particularly the submission deadlines of major deliverables and the completion deadlines of major activities. For example, the proposed inputs of Irrigation Specialist and Team Leader is envisaged to be more during feasibility studies of Tranche-2 projects and major submissions such as annual, mid-term review, and draft completion and final submissions. In a similar manner, the inputs of Environmental Specialist are concentrated more during feasibility studies of VNC and TLBC and then on a regular basis for monitoring of safeguard compliance during the Gondhi modernisation implementation.

Table 15: Staff schedule for PSC services

No.	Name	Position	Location of Input	Expert's Input (in person /months)																																										Total time-input (in Months)		
				2015	2016												2017												2018												2019							
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	Home	Field	Total
	KEY EXPERTS																																															
International																																																
K-1	Dr. Ashok Kumar Raut	IS/TL	Home																																											0.0	▨	20.0
			Field	🟦	🟦	🟦		🟦	🟦			🟦	🟦			🟦	🟦	🟦			🟦	🟦			🟦			🟦			🟦			🟦			🟦				🟦	🟦			🟦	▨	20.0	
		Subtotal																																												0.0	20.0	20.0
National																																																
K-2	Doraiswamy. R	PIM/DTL	Home																																											0.0	▨	42.0
			Field	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	▨	42.0	
K-3	Dr. M.K. Khaishagi	Operation & Maintenance	Home																																											0.0	▨	32.0
			Field	🟦	🟦		🟦	🟦		🟦	🟦	🟦		🟦	🟦	🟦		🟦	🟦	🟦		🟦	🟦	🟦		🟦	🟦	🟦		🟦	🟦	🟦		🟦	🟦	🟦		🟦	🟦	🟦		🟦	🟦	🟦	🟦	▨	32.0	
K-4	A. Rajagopal	Water Institutions Specialist	Home																																											0.0	▨	32.0
			Field	🟦		🟦	🟦		🟦	🟦	🟦		🟦	🟦	🟦		🟦	🟦	🟦		🟦	🟦	🟦		🟦	🟦	🟦		🟦	🟦	🟦		🟦	🟦	🟦		🟦	🟦	🟦		🟦	🟦	🟦	🟦	🟦	▨	32.0	
K-5	Dr. Virendra Pratap Singh	Agriculture Specialist	Home																																											0.0	▨	20.0
			Field	🟦		🟦	🟦		🟦	🟦			🟦	🟦			🟦	🟦			🟦	🟦			🟦	🟦		🟦	🟦				🟦				🟦				🟦	🟦			🟦	▨	20.0	
K-6	Srinath N. Anekal	Environment Specialist	Home																																											0.0	▨	8.0
			Field		🟦		🟦		🟦				🟦					🟦				🟦							🟦											🟦						▨	8.0	
K-7	Dr. K. Balachandra Kurup	Social Development & Gender Specialist	Home																																											0.0	▨	24.0
			Field		🟦		🟦	🟦		🟦	🟦		🟦	🟦		🟦	🟦	🟦				🟦	🟦		🟦	🟦			🟦	🟦			🟦	🟦			🟦	🟦	🟦		🟦	🟦	🟦			▨	24.0	
K-8	Sambasiva Rao Kandimalla	Construction Management	Home																																											0.0	▨	9.0
			Field							🟦	🟦			🟦					🟦	🟦			🟦	🟦		🟦	🟦																			▨	9.0	
	Pushpendra Srivastava	Construction Management	Home																																											0.0	▨	9.0
			Field		🟦			🟦	🟦			🟦	🟦			🟦	🟦				🟦	🟦																								▨	9.0	
K-9	Gopala Rao B S	Communication Specialist	Home																																											0.0	▨	8.0
			Field			🟦					🟦					🟦						🟦						🟦				🟦				🟦				🟦						▨	8.0	
K-10	Jitendra Kumar Agrawal	MIS Specialist	Home																																											0.0	▨	8.0
			Field	🟦	🟦			🟦			🟦				🟦					🟦							🟦												🟦							▨	8.0	
K-11	Shreeshail. V. Yakkundimath	Procurement Specialist	Home																																											0.0	▨	12.0
			Field			🟦	🟦			🟦	🟦				🟦	🟦				🟦	🟦				🟦	🟦				🟦	🟦															▨	12.0	
		Subtotal																																												0.0	204.0	204.0
Non-Key Experts / Staff																																																
N-1	Sairamulu Saidugari	MIS/IT Support	Home																																											0.0	▨	42.0
			Field	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	▨	42.0	
N-2	Deepak Kumar G N	Site/Design Engineer	Home																																											0.0	▨	42.0
			Field	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	▨	42.0	
N-3	To be Named	AutoCAD Draftsman	Home																																											0.0	▨	12.0
			Field										🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦																						▨	12.0	
		Subtotal																																												0.0	96.0	96.0
Administrative Support Staff																																																
A-1	Giridhar Gowgua	Office Manager	Home																																											0.0	▨	42.0
			Field	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	▨	42.0	
A-2	Naveen Kumar	Computer operator	Home																																											0.0	▨	42.0
			Field	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦	▨	42.0	
		Subtotal																																												0.0	84.0	84.0
		Total																																														404.0

5 QUALITY MANAGEMENT

The quality of the Consultant's outputs must meet or exceed the industry and country norms and any additional requirements specified in the Contract. Prior to commencing any design, the Team Leader shall meet with the Client, to develop a clear understanding of what standard of quality is required and what can be achieved. Throughout the consultancy, the Team Leader will monitor:

1. process performance (e.g. are Consultant's staff following process procedures (such as design procedures), are Consultant's staff complying with activity schedules in performing tasks, etc.)
2. product conformity (i.e. do the Consultant's outputs conform, and are they delivered on time)
3. customer satisfaction.

As mentioned earlier also in Staffing and Organisation Section, internal audits and oversight by the SMEC's Project Director for the assignment will be the main 'tool' used to conduct monitoring of the above three items.

5.1 Consultancy Audits and Audit Schedule

The Consultant shall be subject to internal audits (i.e. conducted by the Consultant's staff), noting that the auditor/s may be from the Consultant's Team, or may be the Consultant's staff from another office. Any of these audits can focus on just certain aspects of the consultancy or may be a full consultancy audit. These audits can focus on performance, management processes, and/or technical outputs.

Although the Team Leader is always reviewing the progress and performance of the Project, a formal internal audit provides a more structured approach to the monitoring of the consultancy. Ideally the auditor/s is/are independent (i.e. are not part of the Consultant team), to provide a better level of impartiality in the audit (checking) process. As a result of any audit, a record (as the audit report) is produced.

The Team Leader shall determine the schedule of any internal audits to be conducted by the Consultant's non-project staff. The Consultant's relevant business management system procedures for these audits are shown in Table 16.

Table 16: Relevant SMEC Business Management System Documents for Audits

Description	Location
SC PR101: Audits	BMS / Supporting Functions / Systems and Controls / Procedures
F-SC10108: Audit Schedule	BMS / Supporting Functions / Systems and Controls / Form

5.2 Quality Management System

The International Standard for Quality Management is ISO 9001:2008. SMEC and a number of the Consultant subsidiaries (e.g. SMEC India) are certified to ISO 9001:2008.

An integrated management system will be implemented. This will conform with the requirements established in the Consultant's Quality Management System which conforms to the requirements stated in ISO 9000:2006. Although the Team Leader has overall responsibility for project quality,

SMEC's Regional and Functional Managers also have a responsibility to ensure quality standards are being achieved.

5.3 Review and Verification

All consultancy outputs will be reviewed and verified prior to issue. The Verification\Review Schedule identifies which deliverables are to be reviewed and assign responsibility for the review. All outputs will be verified using a work verification record in accordance with the standard Consultant procedures. The Team Leader will define which processes and forms are used when undertaking work verification and these shall be included in the Design Process Plan. The Internal Work Verification Record (IWVR) Forms are to be attached to the Design Process Plan as a tool for controlling the process and is retained on file as a record.

6 COMMUNICATIONS MANAGEMENT

The success of a Project is very much dependent on regular, efficient and well documented communications. The Consultant's Project Team will hold regular progress meetings with KNNL PMU/PIO, to ensure that the agreed tasks as identified in this Inception Report are achieved within applicable deadline dates and to communicate key issues and proposed solutions arising during the process. Where required, members from the Consultant's Team will attend these meetings to provide relevant feedback and advice. It is foreseen that the Team Leader will liaise with PMU and PIOs on a regular basis to ensure that the Project stays on track and that any potentially problematic issues will be unblocked immediately.

6.1 Authorized Representatives

The Authorized Representatives are:

For the Client:

The Management Director

Karnataka Neeravari Nigam Ltd (KNNL)

4th Floor, Coffee Board Building, No.1 Dr B R Ambedkar Veedhi, Bangalore – 560 001

Phone: 22280374-78

Fax: 22386015

Email: pdadb.knnl@gmail.com

For the Consultant:

The Team Leader

SMEC International Pty Ltd

#28, 1st Cross Street, Gandhi Nagar, Shimoga – 577 201 INDIA

Telephone: +91-8182 402342

E-mail: ashok.Raut@smec.com

In any case, all communications are binding to both parties the Client and the Consultant carried out as per the provisions of the Consultancy Contract Agreement between the KNNL and SMEC.

6.2 Communications Protocol

The communications protocol identifies the types of information to be distributed, the authority to distribute and the method of distributing information to stakeholders. The Team Leader, once delegated the authority to do so, is the only person who will be authorized to communicate formally with the Client.

Informal communications may occur between other members of the Consultant's Team but these are always treated as non-binding until such time as confirmed in writing by the Team Leader.

The Team Leader has discussed these protocols with each team member during early stage of the assignment and will do so when new member is mobilised on the project.

7 MANAGEMENT OF STAKEHOLDERS

The Consultant understands that there are a number of key stakeholders involved in the project including large community in the form of WUCSs. Sensitising such a large mass as per the project requirement is obviously a challenge, which may require a structured consultation process to be devised.

7.1 Identification of Stakeholders and the Compilation of a Database

Some of major stakeholders have already been identified and their names and contact details registered on a project stakeholder database. The stakeholder database will be managed and maintained during the course of the consultancy and will be used to keep all registered stakeholders informed on the progress of the consultancy and Project. Apart from the EA (KNNL)'s operations at various levels, some of the key stakeholder institutions are:

- Water Resources Department
- AC-IWRM
- WALMI
- CADA
- KERS
- Agriculture Department
- Horticulture Department
- FAO
- ICRISAT
- WUCSs (Gondhi, VNC and TLBC), and
- Allied institutions such as HAMPI World Heritage, etc

7.2 Communication Strategy

The Consultant will work with PMU/PIOs to develop an effective communication and engagement strategy, particularly with water users in three selected subproject areas. The preparation of the communication and engagement strategy is to be closely aligned to the social work stream, and the Consultant's team of PIM specialist, Social Development and Gender Specialist and Communication Speciality will develop a communication strategy during early stage of the assignment, and implement it. This will assist to communicate and disseminate various information to the key stakeholders and ensure that they are well informed of the progress, process and outcomes of the work carried out in relation to the Project.

8 RISK MANAGEMENT

Risk is defined in AS/NZS 3100:2009 as the 'the chance of something happening that will have an impact upon objectives'. Risks arise out of uncertainties and are the exposure to the possibility of such things as financial losses or gains, physical damage, injury or delay as a consequence of pursuing or not pursuing a particular course of action. It is measured in terms of a combination of probability of an event and its consequences.

8.1 Project Risk

The Project stakeholders receive the adverse and/or beneficial impacts from the Project risks that are realized. Stakeholders also have the task of managing these risks. Some of the risk criteria identified as to whether a risk is acceptable or not relate to the likelihood of:

- death or serious injury
- project delay
- project cost overrun
- poor quality
- environmental damage
- negative social impacts
- negative publicity
- tampering the canal and structures
- tampering the automation and telemetry.

If necessary, the Consultant will work closely with PMU to develop a Risk Management Plan (RMP) which describes how risk management will be performed for the project. The purpose of a RMP is to ensure that the risks associated with the planning and design are identified, assessed and managed to prevent adverse impacts on the stakeholders and to enhance opportunities with potentially beneficial impacts on these stakeholders.

8.2 Methodology

The risks associated with this Project will be determined and their characteristics documented. The process to be followed in producing this RMP is as follows:

- all risks are identified and included in a risk register
- a risk context will be established
- the risks will be prioritized and its probability of impact and occurrence will be assessed
- the possible cause of the impacts will be described
- existing controls will be described
- corrective and preventative actions will be described
- the roles of and responsibilities will be provided for those who affect the outcome from the risk
- the methodology for mitigating the risk will be described
- an action plan for monitoring proposed.

Each of these aspects will be included in a table format RMP.

8.3 Risk Analysis and Evaluation, Management and Monitoring

8.3.1 Risk Prioritization Method of Ranking

Each of the risks included in the risk register are assigned priorities for further action based on the context in which the risk is found. The evaluation of significance of risk uses the quantitative criteria as shown in Table 17, where likelihood implies the chance of occurrence of risk, consequence the degree of impact if the risk occurs.

Table 17: Risk prioritisation methodology

Likelihood (1)	Consequence (2)	Level of Risk (1x2)	Risk Priority (Score)
1 – Very rare chance of occurrence or causing harm	1 – Insignificant impact or harm	≥ 20	1
2 – Rare chance of occurrence or causing harm	2 – Minor impact or harm	≥ 14 < 20	2
3 – Moderate chance of occurrence or causing harm	3 – Moderate impact or harm	≥ 8 < 14	3
4 – Above average chance of occurrence or causing harm	4 – Major, but reversible impact or harm	≥ 4 < 8	4
5 - Almost certain chance of occurrence or causing harm	5 – Catastrophic impact or harm	≥ 0 < 4	5

8.3.2 Risk Evaluation, Management and Monitoring Plan

Each risk will be assessed in terms of consequence and level of risk to determine a priority with recommendations for possible corrective and preventative actions and a monitoring time frame.

8.3.3 The Risk Management Plan (RMP) for the Consultant

As well as a Project RMP, the Consultant will now develop its own RMP following the same process as described above. This will be followed throughout the life of the Project to monitor risks for the Consultant. The Project progresses, some risks which are identified as serious may downgrade to less serious category, and for this reason, as the circumstances change, the RMP will be revised accordingly.

8.3.4 Project Challenges

Modernisation of the selected subprojects (i.e. Gondhi, VNC, and TLBC) cover a large geographical area involving large community with varied ethnic, political and social backgrounds. The Project stakeholders are scattered across the State and outside such as Bangalore, Shimoga, Munirabad, Dharwad, etc. Also, the selected subprojects in themselves are varied technical issues requiring innovative solutions. As a result, the Consultant expectedly foresee several challenges; some of them will be more evident as the Project progresses. Some of major challenges that are evident at this stage are briefly outlined here.

8.3.4.1 WUCS Mobilisation

As per the requirement of the project selection criteria, the WUCSs in Gondhi need to be sensitised and made them conversant with the project requirements and their roles and

responsibilities before the physical CAD works will start. In a similar manner, the water users of VNC and TLBC need to be mobilised and sensitised to form WUCS and endorse their commitment to share the modernisation cost for CAD woks. These are pre-requisites for the finalisation of feasibility studies of these subprojects.

This is indeed a challenging task, and will require full support from respective CADA offices and KNNL field offices in order to complete the feasibility studies and implementation of physical CAD works in time.

8.3.4.2 Consultation with Stakeholders

As mentioned earlier, the Project covers a large geographical area with large community with diverse ethnic, socio-economic and political backgrounds. Also, the other project stakeholders are scattered across various locations in the State and outside. Consulting all of them as and when required is expected to be a serious challenge. The PSC will need the significant facilitation in this regard from KNNL and CADA operations at various operation levels.

8.3.5 Project Issues

8.3.5.1 PIO Constitution

The FAM stresses the requirement of having individual PIOs for all subprojects selected for modernisation (Figure 18). It will be helpful for PSCs to interact with relevant engineers and officers of both KNNL and CADA on as-required basis if the PIOs are constituted with specifically designating officers on PIOs. For this reason, the PSC was also of the opinion that the PIOs for VNC and TLBC be constituted. PSC assisted TGB Munirabad to constitute PIO for VNC and TLBC as shown in **Appendix D**.

8.3.5.2 Coordination between KNNL and CADA

There is a need for both KNNL and CADA to work together in tandem for successful implementation of the project. As per the institutional arrangement provided in FAM, PIO comprising officers of KNNL and CADA were brought under one platform called PIO.

8.3.5.3 Ownership of DPRs for VNC and TLBC

Considering these subprojects are large by area and also technically complex, the modernisation works are scattered over the large area involving many structures. DPRs were prepared by the Consultants with involvement of KNNL engineers. As feasibility studies will be prepared based largely on the engineering designs and cost estimate and drawings covered in the existing DPRs, The PIO, Munirabad has made arrangements to bring the engineer engaged with consultants during preparation of DPR for VNC and TLBC. PSC would assist PIO in carrying out detailed review of the DPR in consultation with the consulting firm.

8.3.5.4 Understaffing of CADA and KNNL Field Offices

Based on the information through the meetings with KNNL and CADA engineers and other officers, the Consultant observe that there is shortage of staff in field offices of Munirabad. This may be an issue during the feasibility studies when the Consultant specialists are mobilised to the field for community mobilisation, field verification of the proposed modernisation civil works and other information collection. PIO, Munirabad has taken measures to resolve the above issue by making necessary deputation of field officers.

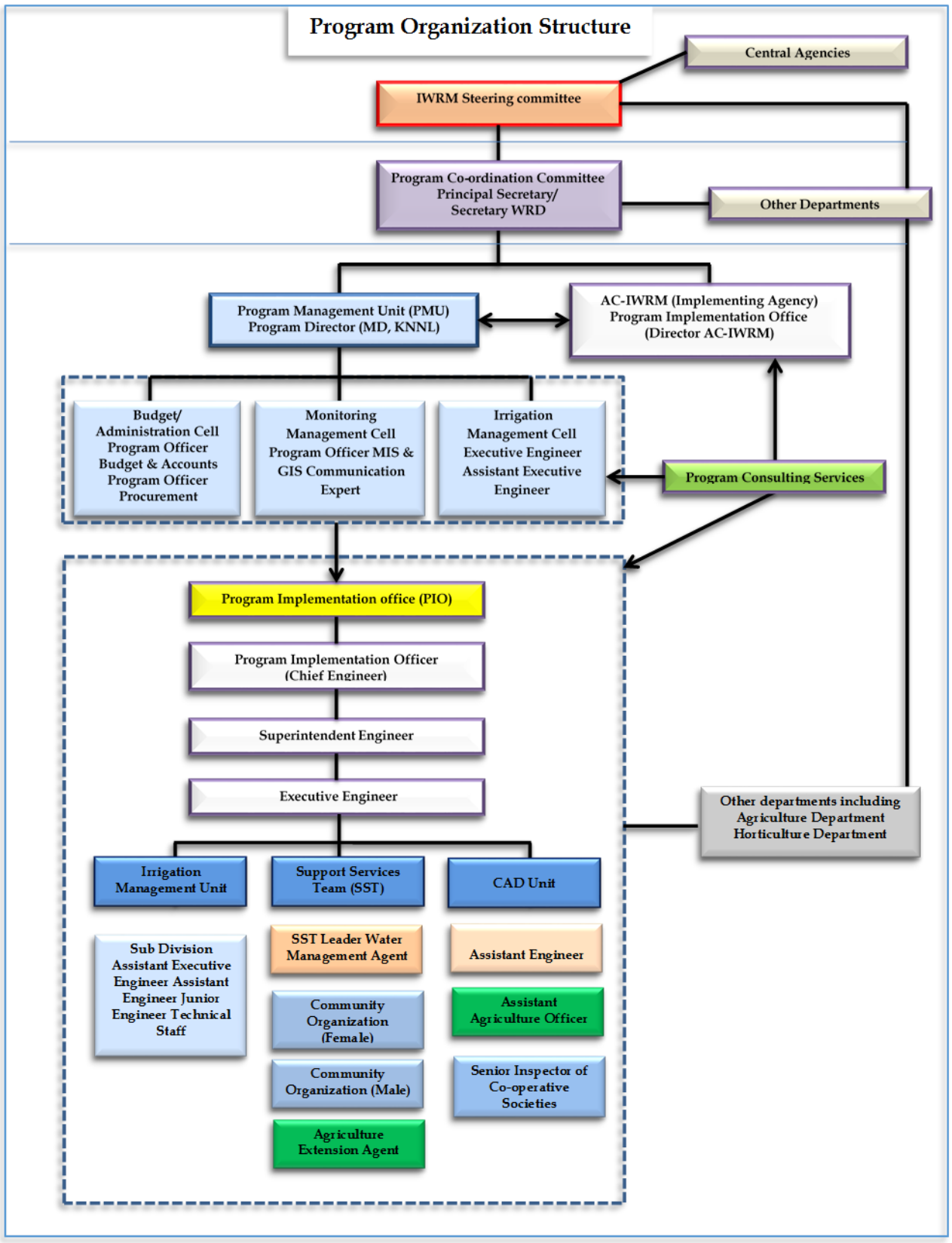


Figure 18: KISWRMIP Detailed Organisation Structure

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Malano and van Hofwegen, 1999. *Management of irrigation and drainage systems- a service approach.* Balkema Publication

Appendix A: Karnataka Government Order on Constitution of PMU

ಕರ್ನಾಟಕ ನೀರಾವರಿ ನಿಗಮ ನಿಯಮಿತ
(ಕರ್ನಾಟಕ ಸರ್ಕಾರದ ಉದ್ಯಮ)
Karnataka Neeravari Nigam Limited
(A Government of Karnataka Enterprise)

Karnatka Neeravari Nigam Limited
(A government of Karnataka undertaking)

OFFICE ORDER

Subject:-	MFF 0085/ Loan No 43253 Implementation of KISWRMIP in the State of Karnataka with the Loan Assistance of Asian Development Bank- Constitution of Project Management Unit Regarding.
Reference:-	Govt Order No: WRD 61 MBI 2012 dated 19 April 2013

***

PREAMBLE

Government of Karnataka, vide Government Order cited above has constituted Project Management Unit (PMU) for implementation of Karnataka Integrated and Sustainable Water Resources Management Investment Programme (KISWRMIP) under Asian Development Bank (ADB) investment appointing Managing Director, KNNL as the Project Director. Further, Government has issued instructions to comply with all the stipulated ADB requirements and the State Government from time to time during implementation of the Programme. Accordingly, the PMU in KNNL has been functioning and taking actions on various activities like recruitment of Project Support Consultants (PSC), Gondhi modernization, telemetry etc of tranche-I of KISWRMIP. The PMU is assisted by Project Implementation Office (PIO) which is the field office headed by the Chief Engineer, UTP Zone, Shimoga. Necessary Order is issued on constitution of PIO by the Chief Engineer. It is necessary now to formalize the arrangements made in Registered Office, KNNL in the implementation of the Programme. Hence, the following Order.

ORDER

Under the circumstances explained in the preamble, following Order is issued on the formation of PMU in KNNL with associated staff with their roles and responsibilities. Managing Director (MD), KNNL is the Project Director for ADB assisted KISWRMIP. The role of PMU staff will be as follows.

Sl No	Designation	Duties and Responsibilities
TECHNICAL WING		
1	Superintending Engineer (SE)	Will assist the Project Director in finalizing all the activities related to KISWRMIP Tranche-I such as recruitment of PSC, Gondhi modernization, telemetry, capacity building, PIM and all other procurement activities as per ADB norms and liaise with PSC once recruited, Tranche-II activities and any work assigned.

A Concern for Water

Regd. Office : 4th Floor, Coffee Board Building, No. 1, Dr. B.R. Ambedkar Veedhi, Bangalore - 560 001. Ph : 22283074-78, Fax : 22386015 CIN : U85110KA1998SGC024503 Website : www.knnlindia.com

Sl No	Designation	Duties and Responsibilities
2	Executive Engineer (EE)	Assist the SE in the implementation of KISWRMIP tranche-I and any work assigned.
3	Technical Assistant (TA)	Assist the EE in the implementation of KISWRMIP tranche-I and any work assigned.
4	Assistant Engineer	Assist the TA in the implementation of KISWRMIP tranche-I and any work assigned.
FINANCE & ESTABLISHMENT WING		
5	General Manager Finance (GM (F))	In-charge of Finance and Accounts wing of the PMU. His role would be to deal with all accounts matters related to KISWRMIP tranche-I.
6	Manager Finance	Assist the GM (F) in the implementation of the Programme.
7	Deputy Manager Finance	Assist the Manager (F).

Sd/-
Project Director,
KIWRMIP & Managing Director,
KNNL

KNN/ADB-PMU/2014-15/593 Dated: 13/1/2015

Copy for information and necessary action to;

1. Mr M G Shivakumar SE, Registered Office, KNNL, Bangalore
2. Mr Ravindra Prasad GM (F), Registered Office, KNNL, Bangalore
3. Mrs Nagaveena M (F), Registered Office, KNNL, Bangalore
4. Mr Rajeev Patil Dy M (F), Registered Office, KNNL, Bangalore
5. Mr Manjunath S EE, Registered Office, KNNL, Bangalore
6. Mr Manjunath S TA, Registered Office, KNNL, Bangalore
7. Mrs K Deepa AE, Registered Office, KNNL, Bangalore

Project Director,
KIWRMIP & Managing Director,
KNNL

Appendix B: Proceedings of Startup Meeting

ಕರ್ನಾಟಕ ನೀರಾವರಿ ನಿಗಮ ನಿಯಮಿತ

(ಕರ್ನಾಟಕ ಸರ್ಕಾರದ ಉದ್ಯಮ)

Karnataka Neeravari Nigam Limited

(A Government of Karnataka Enterprise)

Proceedings of the startup meeting held under the Chairmanship of Project Director &Managing Director KNNL on 23.12.2015 at registered office, KNNL, Bangalore with SMEC International Pty Ltd.

List Of officers: Enclosed separately.

The multi-tranche financing facility (MFF) of the Karnataka Integrated and Sustainable Water Resource Management Investment Program (KISWRMIP) is under implementation by Karnataka Neeravari Nigam Limited (KNNL) under ADB assistance.

The agreement with SMEC International Pty Ltd as Project Support Consultants (PSC) for tranche-1 has been entered in to by KNNL on 20-11-2015. This meeting has been convened to review the progress of various activities taken up by the PSC in tranche-1. The activities of PSC mainly comprise of support to Gondhi modernization, strengthening of WUCS in Gondhi command area, the capacity building programme an development of MIS. The Project Director, KISWRMIP & Managing Director KNNL, Bengaluru stressed on the necessity of time bound implementation of the activities under Tranche-1.

Mr.K.K. Gupta of SMEC (India) Pvt. Ltd. reported that after signing the agreement on 20.11.2015, they have already established their local offices in Shivamogga and the Irrigation Specialist and team leader Dr. Ashok Raut has been deployed. Dr. Ashok Raut present in the meeting reported that he had visited the offices of Chief Engineer, UTP Shivamogga and ICZ Munirabad and also visited the project areas of Gondhi, Vijayanagara Channels (VNC) and TLBC and gathered the data. The scope of work of PSC covering the following outputs coming under ADB assisted projects was discussed;

1. Output 1: State and basin institutions strengthened for IWRM
2. Output 2: Irrigation System Infrastructure and Management Modernised.
3. Output 3: Program Management System Operationalised

The scope of the project involves both irrigation modernization and CADA activities such as Command Area Development activities, strengthening WUCs etc. It is necessary that both KNNL and CADA have to work in coordination with other in implementing the programme. In this regard, Mr. M. Shivaswamy, Director CADA expressed that his Department would take up activities pertaining to CADA through the respective CADAs in Shivamogga and Munirabad.

Mr. R.Doraiswamy, PIM Specialist (Deputy Team Leader) from SMEC reported that the modernization of Gondhi being taken up now has generated interest among the farmers of the area and that they are eagerly looking forward to the modernization programme and to participate in the irrigation management. He mentioned that earlier, during 2015, a *Jatha* was organized with the farmers of Gondhi with the slogan "*Namgagi Gondh, Gondhigage Navu*" i.e. *Gondhi is for us, and we are for Gondhi* which was very successful and brought about awareness in the farmers in the participatory approach and the need for water savings. The

A Concern for Water

Regd. Office : 4th Floor, Coffee Board Building, No. 1, Dr. B.R. Ambedkar Veedhi, Bangalore - 560 001. Ph : 22283074-78, Fax : 22389015 CIN : U85110KA1998SGC024503 Website : www.knnlindia.com

command area of Gondhi covers an area of ten WUCs, out of which nine are formed and one WUC is yet to be formed.

The need and urgency of preparing feasibility report of tranche-2 by PSC was discussed in detail and SMEC were impressed upon to expedite the preparation of feasibility report on the DPRs of modernization of VNC and TLBC as per ADB norms and formats. Mr Ashok Raut acknowledged that he was in receipt of the DPRs of these projects which are placed before CWC, New Delhi and awaiting clearance.

The Project Director stressed upon the PSC to expedite the feasibility report so that the tranche-2 can be taken up during 2016. All the Officers of KNNL connected with the implementation of the Programme should take keen interest in the Programme implementation and CE as head of the Project Implementation Office (PIO) based in Shivamogga should monitor the progress of the activities of KISWRMIP by conducting monthly review meetings with the PSC during first week of every month and report to Managing Director. A monthly review meeting with PSC would be held in KNNL Registered Office, Bengaluru during second week of every month.

The meeting concluded thanking the Chair.

Project Director,KISWRMIP
& Managing Director

No.KNN/KISWRMIP/PSC/Start-up meeting/AE-15/2015-16/5095 Dt:02/01/2016

Copy for information and necessary action to:

1. The Director, CADA, Nirman Bhavan, Complementary Building, 1 Floor, Dr. Rajkumar Road, 1 Block Rajajinagar, Bengaluru (e mail: cadadirectorate.kar@gmail.com).
2. The Chief Engineer, Irrigation Central Zone, Munirabad. (e mail : ceiczmrb@yahoo.co.in)
3. The Chief Engineer, Upper Tunga Project Zone, Shivamogga. (e-mail: ceutpknnlsmg@gmail.com)
4. The Superintending Engineer, Tungabhadra Project Circle, Munirabad.
5. The Superintending Engineer, Bhadra Project Circle, BR Project. (e mail: sehpcbrp@yahoo.co.in)
6. Executive Engineer, No.4, BRLBC Division, Bhadravathi, Shivamogga.
7. Executive Engineer, KNNL Bengaluru.
8. Executive Engineer (Designs), KNNL Bengaluru.
9. Managing Director, SMEC (India) Pvt. Ltd, 5th Floor, Tower C, Building 8, DLF Cyber City, Phase-II, Gurgaon, Haryana-122002. (email : krishna.gupta@smec.com)

List of Officers

Sriyuths

1.	R. Rudraiah	:	Project Director, KISWRMIP & Managing Director, KNNL - in the Chair
2	M G Shivakumar	:	Superintending Engineer (RO), KNNL
3	S Manjunath	:	Executive Engineer
4	C.S. Nagendra	:	Executive Engineer (Designs)
5	D.S. Harisha	:	Technical Assistant (Designs)
6	Eshwar Chandra K.S.	:	Technical Assistant-6
7	C B Niranjan	:	Assistant Engineer
	UTP Zone		
8	A.S.Patil	:	Chief Engineer
9	B. N. Phaniraju	:	Superintending Engineer, Bhadra Project Circle, BRP
10	R. Ravichandran	:	Executive Engineer (I/c) No.4 BRLBC Division & Assistant Executive Engineer, No.3, BRLBC Sub-division
11	Pradeep M	:	Assistant Engineer, O/o EE, No.4, BRLBC Division.
	Irrigation Central Zone		
12	Nagabhushan	:	EE. No.1, TR Division
13	Lalitha Prasad	:	Assistant Executive Engineer
	CADA		
14	M.Shivaswamy	:	Director, CADA
15	Syed Nayeemullah Khadri	:	Superintending Engineer

Appendix C: Proceedings of Review Meeting

PROCEEDINGS OF THE MONTHLY REIVEW MEETING ON KARNATAKA INTEGRATED AND SUSTAINABLE WATER RESOURCES MANAGEMENT INVESTMENT PROGRAM (KISWRMIP) HELD UNDER THE CHAIRMANSHIP OF CHIEF ENGINEER, KNNL, UPPER TUNGA PROJECT ZONE, SHIVAMOGGA ON 25.01.2016

List of Officers present: Enclosed separately.

ADB assisted Karnataka Integrated and Sustainable Water Resources Management Investment Program (KISWRMIP) is under implementation by Karnataka Neeravari Nigam Limited (KNNL).

The agreement with M/s SMEC International Pty Ltd as Project Support Consultant (PSC) for tranche-1 has been entered in to by KNNL. The tranche-1 will be implemented within 42 months between 2015 and 2019. This meeting was convened to review the progress of various activities taken up since its mobilisation by PSC in tranche -1.

The Chief Engineer, KNNL, UTP Zone, Shivamogga as head of the Project Implementation Office (PIO) welcomed the officers and asked Mr. Ashok Raut, Team Leader, SMEC International Pvt. Ltd to briefly explain the scope of work, role of KNNL, CADA and PSC in IWRM, program of KISWRMIP and purpose of consulting services.

Mr. Ashok Raut, Team Leader, M/s SMEC International Pty Ltd presented briefly the scope of work, role of KNNL, CADA and PSC in IWRM, program of KISWRMIP and purpose of consulting services.

The Chief Engineer has constituted PIO for tranche -1 subprojects as below.

Sl.No.	Designation/Address of the officer	Remarks
1	Chief Engineer, KNNL, Upper Tunga Project Zone, Shivamogga	Program Implementation Officer
2	Superintending Engineer, KNNL, Bhadra Project Circle, B.R.Project	Supporting Officer
3	Executive Engineer, KNNL, No.4, BRLBC Division, Bhadravathi	Supporting Officer
4	Assistant Executive Engineer, No. 3, BRLBC Sub Division, Bhadravathi	Supporting Officer
5	Assistant Executive Engineer, No. 2, BRRBC Sub Division, D.B.Halli	Supporting Officer
6	Shri Ranganath, Assistant Engineer, Bhadra CADA, Malavagoppa, Shivamogga	CADA Staff deputed to PIO

7	Shri Kanthanj, Senior Inspector of Co-Operative Society, Bhadra CADA, Malavagoppa, Shivamogga	CADA Staff deputed to PIO
8	Shri Shivamurthy, Assistant Agriculture Officer, Bhadra CADA, Malavagoppa, Shivamogga	CADA Staff deputed to PIO
WUCS Support Service Team		
1	Community Organiser (Male)	To be recruited by PSC
2	Community Organiser (Female)	To be recruited by PSC
3	Water Management Extension Agent	To be recruited by PSC
4	Agriculture Extension Agent	To be recruited by PSC

The PSC has been looking for the suitable candidates for the WUCS Support Services Team and will soon present the CVs to PIO for discussion and concurrence before sending the recommendation to PMU.

Similarly, PIO has to be constituted for tranche-2 subprojects in the office of Chief Engineer, KNNL, Munirabad Zone comprising of Project Implementation Officer and supporting officers.

Doraiswamy R, Deputy Team Leader, M/s SMEC International Pvt. Ltd requested the Chief Engineer to allow them to establish office for WUCS Support Service Team in the Gondhi PIO. Superintending Engineer, KNNL, Bhadra Project Circle, B.R.Project has assured that suitable arrangements will be made to establish office at Bhadravathi Division.

Chief Engineer has advised the PSC to hold the contract management training for the officers as early as possible. The Team Leader has informed that training will be held during the month of February for officers of the PIO.

Deputy Team Leader has informed that the inception report comprising of progress and other necessary details will be submitted as early as possible.

It was decided in the meeting that monthly review meeting will be convened on 5th day of every month,. If the 5th day happens to be a holiday, then meeting will be held on the next working day.

The meeting concluded with the note of thanks by the Chair.

Sd/-
Chief Engineer,
KNNL, Upper Tunga Project Zone,
Shivamogga

No:C.E:KNNL:UTP Zone:KISWRMIP:TA-2:PB-1:2015-16

5555 30 JAN 2016

Copy to:

1. The Additional Chief Secretary, Water Resources Department, Vikasasoudha, Bengaluru for kind information.
2. The Managing Director, KNNL, Bengaluru for kind information.
3. The Director, CADA, Nirman Bhavan, Complementary Building, I Floor, Dr. Rajkumar Road, I Block, Rajajinagar, Bengaluru for kind information.
4. The Administrator, Bhadra CADA, Malavagoppa, Shivamogga for kind information and necessary action.
5. The Chief Engineer, Irrigation Central Zone, Munirabad for kind information and necessary action.
6. The Superintending Engineer, Tungabhadra Project Circle, Munirabad for information and necessary action.
7. The Superintending Engineer, KNNL, Bhadra Project Circle, B.R.Project for information and necessary action.
8. Executive Engineer, KNNL, No.4, BRLBC Division, Bhadravathi for information and necessary action.
9. Executive Engineer, No. 1, T.R. Division, Munirabad for information and necessary action.
10. Executive Engineer, Bhadra CADA, Malavagoppa, Shivamogga for information and necessary action.
11. Mr. Ashok Raut, Team Leader, House No. 28, 1st Cross Street, Gandhi Nagar, Opp. Bhandari Gas Agency, Shivamogga for information and necessary action.

Chief Engineer,
KNNL, Upper Tunga Project Zone,
Shivamogga

LIST OF OFFICERS PRESENT

1. Shri A.S.Patil, Chief Engineer and Project Implementation Officer (KISWRMIP), KNNL, Upper Tunga Project Zone, Shivamogga.
2. Shri B.N.Phaniraju, Superintending Engineer, KNNL, Bhadra Project Circle, B.R.Project.
3. Shri M.S.Basavappa, L.D.O (Engineering), Bhadra CADA, Malavagoppa, Shivamogga.
4. Shri Ravichandra, Executive Engineer (I/c), No.4, BRLBC Division, Bhadravathi.
5. Shri Shambiah, Executive Engineer, Bhadra CADA, Malavagoppa, Shivamogga.
6. Shri S.B.Nagabushan, Executive Engineer, No. 1, T.R Division, Munirabad.
7. Shri B.A.M. Manjunath, Executive Engineer (I/c), No.1 Division, Oddaratti.
8. Shri P.H.Fazlulla, Assistant Executive Engineer, Bhadra CADA, Malavagoppa, Shivamogga.
9. Shri Pradeep.M, Assistant Engineer, Office of Executive Engineer, No. 4, BRLBC Division, Bhadravathi.
10. Dr. Ashok Raut, Team Leader, M/S SMEC International Pvt. Ltd, Shivamogga.
11. Shri Doraiswamy, Deputy Team Leader, M/S SMEC International Pvt. Ltd, Shivamogga.

Appendix D: Project Implementation Offices for VNC and TLBC