

Ministry of Water Resources
Bangladesh Water Development Board (BWDB)
Climate-Smart Agriculture and Water Management (CSAWM) Project (BWDB
Part)

Terms of Reference (TOR)
for
Consultancy Services for Design & Construction Supervision
(Package No. CSAWM-WDB-PCU-SD-01)

1. Background of the Project:

The Government of Bangladesh has prepared the Climate-Smart Agriculture and Water Management Project (CSAWM) for introduction of climate resilient agricultural and water management technologies and effective on-farm water management to support the cropping pattern. The Project Development Objective (PDO) of CSAWM Project is to enhance climate resilience and productivity of irrigated agriculture and fisheries in targeted sub-projects. The Government of Bangladesh (GOB) has received World Bank credit for implementation of the project. The project will emphasize on improved water use efficiency and will upgrade the safety standards and efficiency of the water management infrastructure systems to actively support the climate smart agricultural practices. The proposed project, i.e., CSAWM will scale up the pilot reforms program initiated under recently completed Water Management Improvement Project (WMIP) and will incorporate climate change aspects in the project design. Further, the project is aimed to widespread implementation of the participatory subproject management approach on a larger scale and institutionalization within Bangladesh Water Development Board (BWDB), Department of Agricultural Extension (DAE) and Department of Fisheries (DOF) structure. The proposed project will also strengthen Water Management Organizations (WMO) formed under WMIP, where possible, and will form the new WMOs.

During the past half a century, more than 910 water resources sub-projects were completed, ranging in size from small to large with varying multipurpose types from FCDI (Flood control Drainage & Irrigation) / Flood Control and Drainage-FCD (inland and coastal embankments and polders; small-scale FCDs; compartmentalization; river training and bank protection and river dredging), urban FCD, minor/small-scale irrigation, and major/large-scale irrigation to structural and non-structural flood proofing subprojects. Infrastructures provided in these subprojects constitute, about 16443 km of embankments, 5337 km of irrigation canals, 4425 km of drainage channels, 1379 km of revetments, 15682 sluices, 140 cross dams, 80 groynes, 850 bridges, 225 km of roads and 1,350 buildings and sheds. Some approaches have failed to deliver the intended benefits due to climate change and anthropogenic factors while others have achieved reasonable amount of success; some interventions have helped alleviation of rural poverty while others have aggravated the situation, creating a good social cohesion as well as bad social conflict.

In this backdrop, the GOB has formulated the National Water Policy (NWP) with the intention of guiding future public and private actions for ensuring optimal development and management of water that benefit both individuals and the society at large. The NWP provides the directives and the guidelines for fundamental and wide-ranging reforms of the water sector and its two principal organizations, BWDB and WARPO. In 2001, a *Guideline for Participatory Water Management (GPWM)* was approved by the National Water Resources Council (NWRC) to facilitate the process of participatory water management at all levels of water management in Bangladesh. A National Water Management Plan (NWMP) has been approved by the Government in 2004 with the main objective of developing a macro water management plan for operationalizing the directive of the NWP. For effective people's participation Government has approved Participatory Water Management Rule 2014 under the purview of BWDB Act 2000.

The reform initiatives thus initiated by the Government have created an enabling environment for taking concrete actions and as a result, this Project has been conceived as an instrument for carrying forward Climate Smart Agricultural Water Management.

The Consultants will assist BWDB in ensuring improved functionalities of the BWDB sub-projects through proper rehabilitation/modernization of the water management infrastructures like water control structures, embankments, protective works, khal/canal/river digging or dredging, pump house etc. in order to create enabling water management conditions for improved and climate resilient agriculture and fisheries production. 19 numbers medium to very large BWDB sub projects (ranging between 1,000 ha to 15,000 ha) have been finalized under this project which will be implemented in 27 upazilas of 17 districts in Bangladesh at a cost of IDA loan USD\$ 100 million and GoB Tk. 33255.18 Lakh. The Consultants will also assist in capacity development of the BWDB officials including the Office of the Chief Water Management. In addressing the climate change properly among others it would also require consulting services for (i) Updating & implementation of Subproject Information Management System-Smart (SiMS-Smart) and limited scale morphological modelling for erosion protection and dredging as required (ii) Screening and Technical & Environmental Auditing of BWDB Subprojects and (iii) Implementation Resettlement Action Plan (RAP) for the subprojects as required. For the services under SI(iii) one Individual consultant on land Acquisition & Resettlement under PCU and/or BWDB by its own manpower will do the job. There will be an individual Procurement consultant for procurement related activities of goods, works, non-consulting services and services under PCU.

2. Project Components

The project has the following components.

Component 1: Improved Climate Resilience of Flood Control, Drainage and Irrigation (FCDI) Infrastructure Systems

The activities under this component include: (i) rehabilitation of selected FCD & FCDI subprojects identified by the BWDB in consultation with local communities and/or WMOs (Water Management Organization); (ii) management transfer of rehabilitated water management subprojects/infrastructures to local communities, e.g. WMOs; and (iii) institutional development of the BWDB including the Office of the Chief Water Management (OCWM).

Proposed subproject rehabilitation works will seek to modernize the water management infrastructures to the safety standards that can adequately address climate change challenges as well as satisfy the changed demands and needs from farmers who chose to adopt and practice climate-smart agricultural technologies promoted by the project.

In addition, this component will also address Participatory Subproject Cycle Management (PSM) approach to promote the participatory and community mobilization aspects of subproject rehabilitation and management transfer and the involvement of communities in operations and (routine) maintenance (O&M) management. The participatory process is based on the Participatory Water Management Rule 2014 adopted by the Government. This component will also include a series of capacity building and training activities focused on capacity strengthening of BWDB with emphasis on OCWM and Directorate of Audit, and WMOs. The capacity enhancement of the WMOs will be done so that they can effectively take responsibilities for O&M of the subprojects whose management is transferred to them.

Component 2: Climate-Smart Agriculture and Fisheries Production and Marketing

Taking advantage of the improved and resilient water management conditions (both in terms of flood control and drainage in the monsoon season, and increased availability of water in the dry season) accruing out of investments in Component 1, project support under this component will focus on increasing the productivity and resilience of both crop and fisheries production systems to climate change while also pursuing opportunities for reducing greenhouse gas (GHG) emissions from these production systems. This is a departure from the earlier project and is meant to improve farmers' incomes and livelihoods which would in turn also improve the prospects of sustainability of investments under Component 1.

Component 3: Project Management Support

This component will cover the project management including implementation of ESMF, monitoring and evaluation of all project activities in line with the Results Framework, and set-up adequate fiduciary, governance, audit and accountability mechanisms; grievance redress mechanism, communication and monitoring and evaluation, and special studies. This component will also support introduction of interactive voice response (IVR) system to promote effective citizen engagement through disseminating information of projects and associated agriculture and aquaculture interventions to seek community feedback.

Component 4: Contingency Emergency Response

This component with zero budget allocation will concentrate on the expenditures under the Immediate Response Mechanism (IRM) in case of natural or man-made crises or disasters, severe economic shocks, or other crises and emergencies in the country.

3. Objectives of CSAWM

The objectives are (a) to rehabilitate and modernize the FCD and FCDI subprojects to enhance agriculture and aquaculture/fisheries production by improving the water use efficiency, management transfer and capacity building of WMOs and to enhance institutional performance of BWDB including the OCWM.

(b) to improve national water resources management introducing IWRM and to build resilience to climate change risks by involving the local communities to play an expanded role in all stages of the Participatory Subproject Cycle Management (PSM), from planning and design to operations and management.

4. Implementation Arrangement

To promote an integrated approach, the project implementation has a joint and shared responsibility of the Ministry of Water Resources (MOWR), Ministry of Agriculture (MOA) and the Ministry of Fisheries and Livestock (MOFL), respectively working through the BWDB, the DAE and the DoF. Working jointly, each implementing entity- BWDB, DAE and DoF- will take the lead on project elements under their respective institutional mandate, capacity and skills endowment. In this case, BWDB will take the lead on activities related to Component 1 (Improved Climate Resilience of Flood Control, Drainage and Irrigation (FCDI) Infrastructure); DAE will be the lead entity on Component 2 (Agriculture Production Improvement and Market Access); while activities targeting to the Aquaculture production improvement and Market Access (Component 2) will be led by DoF. Each of these components have separate DPPs approved by the Government having common project objectives to be achieved via working in close collaboration and integrated manner. Both DAE and DoF should be actively engaged in all steps of WMO formation, activities and their sustenance.

Project Coordination Unit (PCU) at BWDB is responsible for overall coordination across all project activities. The PCU will be headed by a Project Coordinating Director (PCD) and will be staffed with a Procurement Specialist, Financial Management Specialist and M&E Expert. The DAE and DoF have established their Project Implementation Unit (PIU) responsible for implementation of their respective components and coordinating with the PCU. Short term Technical Assistance/consultancy services will be recruited to fill specific skill gaps during project implementation, as needed.

A Project Steering Committee (PSC) has been formed with the chair of the Secretary/Senior Secretary of MoWR and it will be formed with representatives from different ministries/agencies as per GoB directives. The PSC of MoWR works as coordinating PSC, and representatives of Secretary/Senior Secretary of MoA and MoFL are the members of this PSC. The PSC provides overall policy guidance during project implementation. In addition, each of the agencies have their respective Project Implementation Committee (PIC) having the Director General as its chair. There is also a PIC under BWDB formed by MoWR. This PIC acts as central/coordinating PIC. The central PIC is presided over rotationally by the DG of BWDB, DAE & DoF and then other two DGs are the members of that committee. The PIC provides necessary assistance/suggestions for implementing project activities.

The following steps will be followed/reviewed from starting to ending of the project:

Step 1: Short-listing of Subprojects

Initially, BWDB Technical Committee identified 132 subprojects, then the project preparation consultants reviewed and finalized a short list of eligible 42 priority subprojects. The BWDB DPP review committee and an EIA committee then reviewed the 42 subprojects and finalized a short list of eligible 23 priority subprojects. Finally, a technical committee consisting of members from BWDB, DAE, DoF & Department of Forest, formed by MoWR, reviewed the 23 subprojects and selected 19 subprojects. These short listed 19 subprojects had been reviewed and justified for implementation.

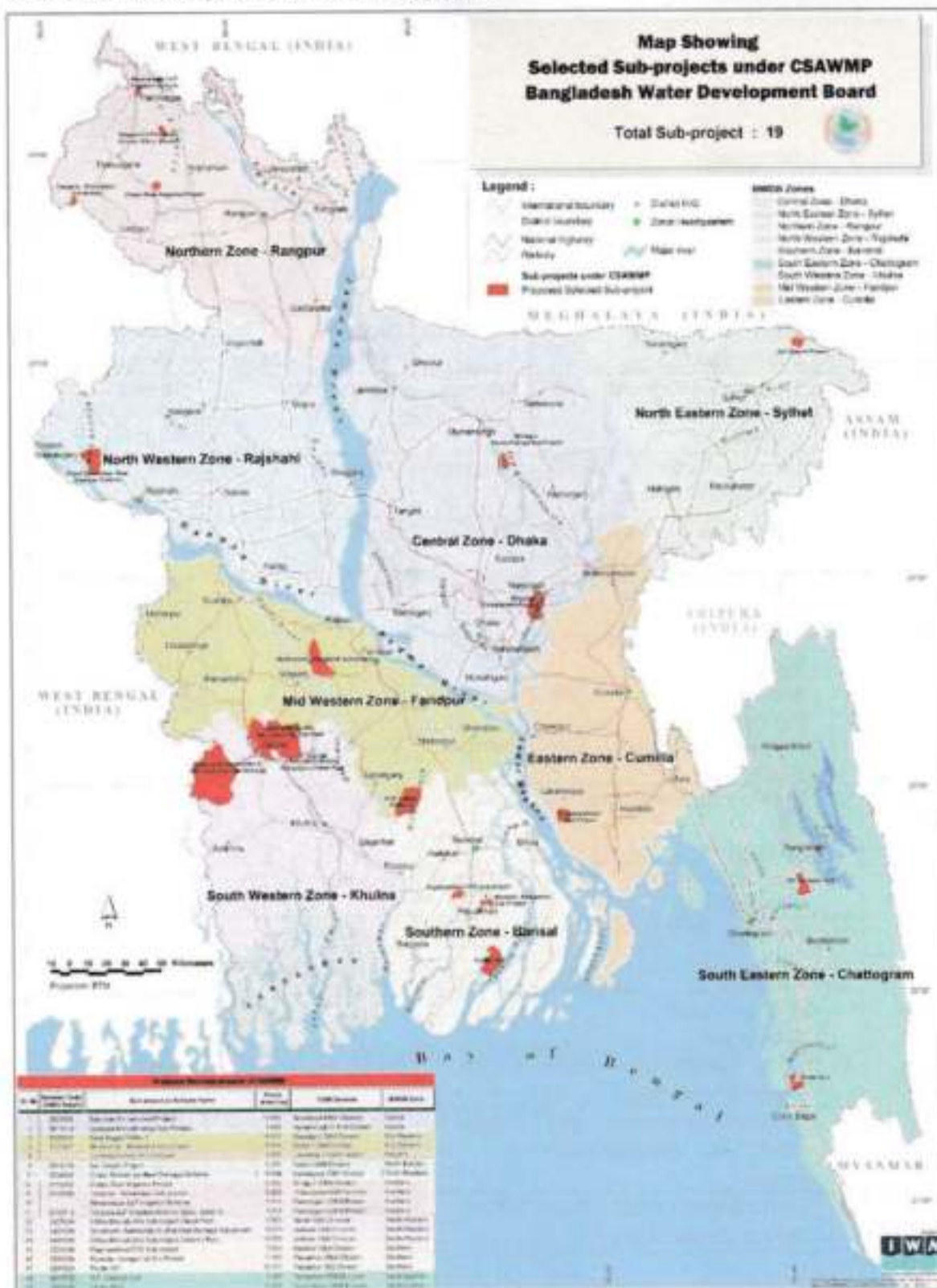
Out of 910 FCD/I completed Subprojects of BWDB, the following criteria has been adopted to select the 19 candidate Subprojects.

- (i) Subprojects ranging between 1,000 ha to 15,000 ha;
- (ii) Subprojects which are most vulnerable to climate change impact;
- (iii) Subprojects with high poverty level;
- (iv) Subprojects with existing WMOs/CBOs or willing to form WMOs; and
- (v) Cost effectiveness of the rehabilitation.

This study considers 19 sub-projects for implementation as mentioned in Table below:

Sl n o	Name of the Sub-Project	Division	District	Upazila
1	Balushair Flood Embankment FCDI Sub-project	Dhaka	Narsingdi	NarsingdiSadar

Sl n o	Name of the Sub-Project	Division	District	Upazila
2	Satla-Bagda FCDI (Polder-1) Sub-project	Dhaka	Gopalganj	Tungipara, Kotalipara
3	Modhukhali-Baliakandi Sub-project (Remaining Work)	Dhaka	Rajbari	Baliakandi
4	Ujanpara-Komarbhanga FCDI sub-project	Mymensingh	Mymensingh & Kishoreganj	Nandail and Iswarganj
5	Sarigoyain FCDI Sub-Project	Sylhet	Sylhet	Jaintapur
6	Chari-Shameshpur FCD Sub-Project	Rajshahi	Rajshahi, Chapai Nawabganj	Chapai Nawabganj Sadar, Godagari
7	Tangaria-Gobindapur Sub-Project (FCDI)	Rangpur	Thakurgaon	Haripur
8	Dhepa-Punarbhaba Water Management Sub-project	Rangpur	Dinajpur	Birol
9	Ahamednagar Low Lift Pump Irrigation Sub-project	Rangpur	Panchagar	Boda
10	Telepara Low Lift Pump Irrigation Sub-project (Electrical Block-3)	Rangpur	Panchagar	Debiganj
11	Ragunathpur FCD Sub-project	Barishal	Barishal	Bakerganj
12	Muradia-Kalagachia Sub-project	Barishal	Patuakhali	Patuakhali & Dumki
13	Rehabilitation of Polder No. 55/1 Sub-project	Barishal	Patuakhali	Galachipa
14	Tie Embankment FCDI Sub-project	Chattogram	Lakshmipur	Lakshmipur Sadar
15	Polder no. 66/3 Sub-project	Chattogram	Cox's Bazar	Cox's Bazar Sadar
16	Karnafuli Irrigation (Ichamati Unit) Sub-project	Chattogram	Rangamati	Rangunia
17	Chitra-Bhairab-Afra Sub-Project (Narail Part)	Khulna	Narail	Narail Sadar
18	Sonamukhibanmandar and other beel drainage sub-project	Khulna	Jashore	Jhikargacha & Sharsa
19	Chitra-Bhairab-Afra Sub-Project (Jashore Part)	Khulna	Jashore	Jashore Sadar, Bagharpara



Step 2: Assessment of Subprojects

Review of assessment of the *Subprojects* will be based on (i) socio-economic base line information; (ii) a technical audit in terms of current effectiveness of the flood control, drainage and/or irrigation infrastructure; (iii) PRA on the rehabilitation requirement; and (iii) vulnerability of the subprojects to climate change impacts.

Step 3: Re-Prioritizing the Subprojects to be implemented under CSAWM

Review and re-prioritization of the *Subprojects* for CSAWM to be implemented batch-wise based on multi-criteria analysis. The criteria includes (i) climate change vulnerability index (CCVI) which shall provide classifications of subprojects as extremely vulnerable, highly vulnerable, moderately vulnerable and less vulnerable; (ii) subproject performance improvement criteria (SPIC) due to proposed rehabilitation/development works under various climate change scenarios; (iii) poverty index, iv) implementation readiness including availability of design, and v) land acquisition required or not.

Step 4: Formulation/mobilization of WMOs

The existing WMOs will be mobilized or new WMOs will be established. The WMOs will be appraised with relevant information regarding the objective of the project, data on existing situation, probable impacts of climate change in the subproject area and proposed interventions (rehabilitation works).

They will also be trained on how effectively they participate in the participatory subproject cycle management (PSM) process.

National WMO expert, junior WMO specialist, and community facilitators/extension overseers will work under the guidance of WMO Consultant, in consultation with PCD/PDs, Chief WM and TL of the Main Consultant. Regular performance monitoring of the facilitators as well as WMO will be done for attaining good quality works and sustainability.

The WMO formation will follow the attached draft 'guidelines for WMO formation and functioning' (*Annexure-I*) to be finalized in consultation with PD and OCWM, BWDB. Identification of prospective WMO members should be done based on, i) hydrological sub-unit via mapping and land classification, and ii) land ownership. In this regard, the successful as well as failure experiences of WMIP, Southwest Area Project, Phase-I & II, Blue Gold Project and IPSWAM project should be used for this task.

Step 5: Planning and design

The local stakeholders and WMO members should be involved in all steps of participatory water management starting from sub-project identification to planning, design, implementation and O&M works and, WMO formation/implementation/sustenance processes. Review of the planning exercise shall include: (i) formulation of a *Subproject* improvement plan in consultation with WMOs; (ii) analyzing feasibility of the plan; (iii) preparing an outline for the operation and maintenance plan; (iv) sign agreement between BWDB, WMO and LGI as required. In all these stages, active participation of the WMOs and other stakeholders should be ensured.

Step 6: Implementation

In this step the following will be executed: (i) preparation/review of designs and cost estimates of rehabilitation and improvement components; (ii) assist in the preparation of tender documents, tendering and award of contracts; and (iii) construction supervision.

The consultant's role will be to prepare a guideline for preparation of designs and cost estimates of the infrastructures to be rehabilitated, and bidding documents according to the applicability of WB Guidelines or GoB, PPA/PPR. The guidelines will be circulated to the field offices to prepare their respective designs, cost estimate and bidding documents.

Step 7: Capacity building for environmental management and O&M

Review of the environmental management plan (EMP) will be finalized for the O&M period with active participation of the WMOs and other stakeholders. Trial operation of the Subprojects will be made for one year together with the WMOs after completion of rehabilitation works. The WMOs will be provided with O&M manuals written in Bangla. WMOs will be trained on the use of O&M manuals.

Step 8: Management transfer

Subproject performance will be assessed jointly with the WMOs and BWDB. The management of the subprojects will be transferred to the WMOs as per agreed guidelines.

5. Duration of the Project

As per the DPP the CSAWM project is to be implemented over a period of four and a half years starting from January, 2022 to June, 2026. The duration of this Consultancy Service is expected to be 36 (thirty six) months within the project duration.

6. Scope of the Consulting Services

This Consultancy services includes Design & Supervision Consultancy with Subproject Inventory & Mapping, Environmental Screening & Auditing, PSM and related activities. The scope of the proposed consultancy services are as follows, but not be limited to:

Task A. Various studies and designs have been done in relation to the implementation of the BWDB sub projects. Before work commencement the Consultant should undertake a comprehensive review of all earlier studies covering the area, such as Water Management Improvement Project, WMIP (2016), Coastal Embankment Improvement Program, CEIP (2012), Integrated Coastal Zone Management Program - ICZMP (2006), Southwest Area Integrated Water Resources Planning & Management Project (SWAIWRPMP-1 & 2, 2015 and ongoing), Blue Gold Project (2021) etc.

Task B. Review and update the infrastructure designs coordinating with the BWDB's design office to finalize the detailed engineering designs with specifications & construction drawings of the subprojects for implementation. Prepare a guideline for preparing the bidding documents of the rehabilitation works and related environmental and social plans (EIAs, EMPs and SIAs). Review and update the information of 19 sub projects to be implemented.

Task C. Assist the Project Director coordinating with Individual Procurement Expert in preparing/reviewing the bidding document, preparation of designs and cost estimates of the infrastructures to be implemented by the BWDB field Executive Engineers.

Task D: Assist in reviewing detailed designs for the WMO Training Centre, coordinating with the BWDB's design office, to finalize the detailed engineering designs with specifications, cost estimate and construction drawings.

Task E: Prepare detail electro-mechanical design, drawing, specification and estimates for remote control based operating system design for water control structures (where feasible and applicable) to make the water control structures automatically operated.

Task F: Updating & implementation of Sub-Project Information Management System-Smart (SiMS-Smart) and limited scale morphological modelling if required for erosion protection and also dredging of the morphologically critical areas of the selected sub projects as required. Detailed Task-F is attached in *Annexure-1*.

Task G: Preparation of EIA and EMP. BWDB has already developed a draft Environmental Management Framework (EMF) for the Project which has been duly reviewed by the World Bank. The EMF provides the guidelines to comply with national legislation and World Bank environmental safeguards policies, and defines all environmental requirements and management plans needed for the re-construction/rehabilitation of physical interventions in the sub-projects. This task will cover the preparation of EIA/EMPs for each subproject & be responsible for getting Environmental clearance from the DoE. This EIA/EMP will form part of the design report mentioned above. For the preparation of the EIA/EMP the Consultant will follow the guidelines of the EMF.

Task H: Screening and Technical & Environmental Auditing of the BWDB selected sub-projects including preparation of Sub-project wise Environmental & Social Impact Assessment (ESIA). Detailed Task-H is attached in *Annexure-2*

Task I: Will assist & coordinate in Implementation of the RAP & LAP. Land Acquisition activities will be needed in 7 subprojects. Resettlement Action Plans (RAPs) must be formulated and implemented as necessary. PCU support Expert (Land Acquisition and Resettlement Expert) and/or BWDB by its own manpower will prepare and implement the RAP & LAP (Land Acquisition Proposal) under the guidance of the PCU.

Task J: Supervise construction of all works under the project, and assist the concerned Engineer in the works contract that will be procured and implemented according to the World Bank Procurement Regulations using World Bank Standard bidding documents as well as agreed bidding document as per applicability. Will also be responsible for supervising the implementation of the EMP.

Task K. Institutional Development & Capacity building of BWDB including the Office of the Chief Water Management, and Water Management Organizations.

Task L. Provide overall project management support to the BWDB and Project Coordination Unit (PCU).

Task M. Coordinate with the M&E Consultant to be engaged under a separate contract regarding monitoring and evaluation of the activities. Also coordinate with the Land acquisition & Resettlement expert/BWDB's nominated concerned person and concerned executive Engineer for assisting in implementation of LAP & RAP and make close coordination with them for achieving the aims & objectives of this consulting services.

Task N. Participate and assist BWDB in formation of WMOs and sustenance of their functioning. In this regard, a draft 'guidelines for WMO formation and functioning' (*Annexure-3*) will be finalized in consultation with PD and OCWM, BWDB and followed accordingly.

Additional Tasks. The consultant will update and carry out any additional engineering studies, investigations and social & environmental studies according to the requirements of the project.

The consultant, relating to WMO activities, will work in a coordinated way with the Water Management officials under PCU and OCWM of BWDB.

The PDO related to irrigation is to increase productivity of irrigated agriculture in the subprojects. The subprojects include large-scale and small-scale schemes including schemes with low-lift pumps, and a few drainage schemes.

For identifying the problems impacting irrigation-water productivity the consultant's tasks need to start with a comprehensive diagnostic exercise, both field-based and desk-based. The checklist for increasing water productivity and farmer income is as follows:

1. Rehabilitation or upgrade of the off-farm system (head works, main-level canals, branch canals);
2. Rehabilitation or upgrade of the on-farm system (below turnouts along the branches, typically WUA-level tertiary canals 1 m³/sec or serving 1,000 hectare each, down to the field-level water courses).
3. Improving the farm level and value chain, linking to markets.

For the off-farm and on-farm systems, the consultants could consult our "What" and "How" chapters of the I&M Guide, which are quite detailed. The following are examples copied from our I&M Guide:

Conducting a diagnostic analysis of system performance: An initial diagnosis of the present performance of the system is a prerequisite to planning. An initial diagnosis – perhaps a 'rapid appraisal' – is essential to have a first idea of the current state of the system and to identify the constraints to improved performance and their causes. The diagnosis may also gauge performance against original design and against comparable systems. The result will be a problem statement and a measure of how far the system falls short of meeting farmers' (evolving) needs. It may also give a first idea of the possible – what are the points that could be improved in the context, what are the possible objectives, what might be the technical (and institutional) itinerary to reaching these objectives.

The application of water accounting in I&M planning: Water accounting is a crucial planning tool as part of the basin/system-wide diagnostics, beyond assessing system performance. Water accounting, which was originally used largely to determine the water balance, nowadays includes the myriad functions of remote sensing, modelling and ICT tools that can be applied to assess before-vs-after modernization impacts on water quantity and quality. Water accounting should thus form part of an I&M feasibility study. Since I&M affects the return flows (environmental flows and groundwater recharge), water accounting is often needed to inform investment decisions. For example, if I&M aims to deliver more flexible water supplies to farms, this typically leads to increased operational/tail-end losses (unless the return water is recoverable downstream at low cost through drainage reuse or pumping). That is why irrigation and drainage systems in the water short or arid areas in Egypt, Uzbekistan and India UP (warabandi) were initially designed for a pre-set rotational water delivery. Hence, the crucial importance of undertaking a basin/system-wide water accounting exercise before investing in modernizing the delivery approach.

For the farm level and value chain, consultants could consult the FLID (Farmer led irrigation development) Guide on facilitating linkages between farmers and market players. The WB draft I&M Guide states:

The decision-making process for smallholder modernization is described from the perspective of development planners in the 2020 World Bank Farmer-led Irrigation Development (FLID) Guide: A what, why and how-to for intervention planning. The FLID Guide sets out seven factors to consider, two of which are assessment of resource potential and evaluation of farmer benefits. Farmers will balance the potential of innovative technology for improving their irrigated farming and tapping into new markets against the availability and potential of water and land under the current regime or, if system level improvements are coming, against what they can do with better water service. This diagnostic process will enable them to set realistic objectives. Typically, these will be business objectives designed to increase farm income: to grow a more profitable crop (inter cropping, diversification), to improve yields or quality of same existing crop; to take advantage of a specific time-bound opportunity such as

off-season production; to reduce costs; or to expand their irrigated area horizontally or increase cropping intensity.

The construction works will be executed by the BWDB as Employer and the Project Director or concerned Executive Engineers from BWDB involved in execution will function as the Engineer. The Consultant will supervise the civil works contracts and ensure that the project works are constructed in accordance with the provision of the contracts. The Consultant will be required to nominate representatives to the work site to ensure that the project works are constructed in accordance with the provision of the contracts.

Note. The scope of the consulting services in this ToR might require adjustment based on the project demand and situation during implementation of the project.

7. Consultant's Staff Requirements with Man-Month

This TOR provides an indicative staffing list for the consultant. The consultant may propose alternative staff and skill mix in order to carry out its role and responsibilities according to the project requirement. Key members of the indicative staffing for the Consultant's team are as follows:

A. International Expertise

Key Expert

Sl. No.	Position	Number	Total Estimated Staff months
K-01	Team Leader/Water Resources Specialist	1	18

B. National Expertise

Key Experts

Sl. No.	Position	Number	Total Estimated staff months
K-02	Deputy Team Leader/Water Management Specialist	1	36
K-03	Deputy Team Leader-1 / Water Resources Specialist-1 (Specially assigned for Task-G &H)	1	12
K-04	Deputy Team Leader-2 (for task F)	1	3
K-05	Construction Monitoring and Quality Control Specialist	2	46
K-06	Participatory Water Management Specialist/Sociologist-1	1	30
K-07	Environmental Specialist-1	1	12
K-08	Socio Economist	1	10
K-09	O & M Specialist	1	12
K-10	Design Engineer	3	60

Sl. No.	Position	Number	Total Estimated staff months
Non Key Experts			
NK-01	Agronomist	1	12
NK-02	Fisheries Specialist-1	1	8
NK-03	Environmental Specialist-2(for Task-G &H)	1	15
NK-04	Database Specialist(for Task-F)	1	3
NK-05	Institutional/WMO Professional(for Task-G &H)	1	3
NK-06	Gender Specialist	1	8
NK-07	GIS Specialist-1	1	6
NK-08	Remote Sensing Specialist	1	4
NK-09	Water Resources Engineer/ Irrigation Engineer	1	15
NK-10	Sociologist-2	1	12
NK-11	Mechanical Engineer	1	12
NK-12	Construction Supervision Engineer	10	290
NK-13	Training Specialist	2	60
NK-14	GIS Professional-2	4	48
NK-15	Participatory Water Management Specialist-2	3	81
NK-16	Database Programmer/Analyst	1	30
NK-17	MIS Professional (for Task-G &H)	1	4
NK-18	Software Engineer(Web and GIS Development)(for Task-F)	1	2
NK-19	Software Developer(Web and mobile)(for Task-F)	1	14
NK-20	Software Tester (for Task-F)	1	2
NK-21	Environmental Expert-3	1	8
NK-22	Fisheries Expert-2	1	8
NK-23	Civil Engineer(for Task-G &H)	3	36
NK-24	Agriculture Engineer(for Task-G &H)	2	24
Non Key Professional			
NK-25	Surveyor	9	216
Technical & administrative Support Staff			
01	Office Manager	1	36
02	Office Engineer-1	1	30
03	Office Engineer-2	1	30
04	Auto CAD Operator	1	30
05	Computer Software/Hardware Maintainer	1	34
06	Data Collection, Entry, Digitizing Assistant(for Task-F)	3	36
07	Office Accountant	1	36
08	Word Processor	3	102
09	Office Assistant	3	99
10	MLSS	3	96

The Consultant may propose other professional/supporting staff required to accomplish the tasks outlined in the ToR. It is the Consultant's responsibility to select the optimum team and to propose the professionals which he believes best meets the needs of the Client. Consultant's head office will be located at Dhaka at their own cost preferably nearby PCU-CSAWM(BWDB Part) Project office.

8. Required Qualifications & Job Descriptions of the Key Professionals of the Consultant.

A. International Expertise: Key Expert

Position	Qualifications and Job Descriptions
K-01: Team Leader / Water Resources Specialist	<u>Qualifications and Experience</u> Team Leader / Water Resources Specialist should have Master Degree in Civil/Water Resources Engineering or Irrigation Engineering with a minimum of 20 years relevant experience in water resources development/ management projects, of which about 10 years in management positions including as a Team Leader. S/he should have at least 3(three) years international experiences outside her/his country of nationality. S/he must have proven ability of working with community organizations in water sector (flood control, drainage and irrigation, river bank/coastal protection etc.) projects. The candidate will have to be computer literate and familiar with relevant programs for this assignment. English ability: Good standard of oral and written English. <u>Job Descriptions</u> The Team Leader will have the overall responsibility for providing timely and quality support to PCU and BWDB's field Units for implementation of the project components in accordance with the TOR for the Consultant. S/he will coordinate and supervise the works carried out by the team members to ensure adequacy and timeliness of the support. The specific job responsibilities of the Team Leader would include but not necessarily be limited to the followings: • Ensuring the successful completion of the prime responsibilities of the Consultant i.e. "building, mainstreaming and institutionalizing the participatory water management systems in selected FCD/FCDI sub-projects"; • Prepare a detailed work plan and determine strategies for accomplishing the agreed Work/Activity Plan; • Full responsibility for day-to-day functions of professionals of the consultants team in the form of providing advice and guidance; • Organize acquisition of primary and secondary data, surveys works, reports, drawings, maps, etc. relevant to the projects; • Liaison and coordinate with other consultants engaged for CSAWM; • Review in consultation with the client organizations the components of selected sub-projects for rehabilitation and improvement under CSAWM; • Co-ordinate the preparation of the quarterly progress reports; • Maintain liaison with concerned officials of

Position	Qualifications and Job Descriptions
	BWDB/MOWR/other related agencies; • Work in close coordination with the PCU and reporting to the Project Director, PCU. • Perform any other project related works assigned by the Project Director as & when required and he/she will be liable to the project Director.

B. National Expertise : Key Expert

Position	Qualifications and Job descriptions
K-02: Deputy Team Leader/ Water Management Specialist	<u>Qualifications and Experience</u> S/he should have Master Degree in Civil Engineering or Water Resources Engineering/development/management or Irrigation Engineering with at least 20 years relevant experience in water resources development projects, including in leadership roles. The Deputy Team Leader/Water Management Specialist will work in close coordination with the Team Leader and assist the Team Leader in accomplishing the planned activities. Experience in working with the foreign aided project will be additional qualification and get preference. The candidate will have to be computer literate and familiar with relevant programs for this assignment. English ability: Good standard of oral and written English. <u>Job Responsibilities</u> Specific job responsibilities of the Deputy Team Leader are similar to those of the Team Leader: • Assist the Team Leader in accomplishing the timely and quality delivery of the agreed Work/Activity Plan; • Assist in Coordinating the activities of the different components in the team; • Organize acquisition of secondary as well as additional data, surveys works, reports, drawings, maps, satellite images etc. relevant to the project; • Provide general guidance to the team and coordinate their activities in conducting or reviewing feasibility study, access and analyze including initial screening of subprojects; • Direct and coordinate the activities under the component in social aspects, technical assessment, non-engineering features and EIA of the selected subprojects; • Provide regular technical backstopping to the team; and the Project Coordinator, PCU; • Develop institutional arrangement that is to be adapted for beneficiaries involvement in O&M activities; • Develop institutional arrangement for the people's participation in O&M and prepare sustainable O&M plans for the subprojects. • Prepare the necessary O&M manuals based on the above assessment; • Prepare guidelines for management and/or execution of O&M activities including recovery of O&M costs from beneficiaries;

	• Prepare guidelines for O&M, including funding arrangements for FCD projects through consultations with beneficiaries and local institutions/organizations; • Assist the WMO Specialist under PCU in preparing annual O&M Plan for the WMG; • In absence of the Team Leader perform the activities of Team Leader and report to the Project Coordinating Director, PCU. • Suggest best solution to the Team Leader in case of ambiguity during project implementation. • Perform any other project related works assigned by the Project Director as & when required and he/she will be liable to the project Director
K-03: Deputy Team Leader-1 / Water Resources Specialist-1 (Specially assigned for Task-G &H)	<u>Qualifications and Experience</u> Deputy Team Leader-1/ Water Resources Specialist-1 should have a Master's degree in water resources development/engineering/Hydrology with at least 20 years of experience of which minimum 5 years in conducting EIA/SIA and water management studies of water development projects as Team Leader/Deputy Team Leader of multi-disciplinary team of professional which include hydrologist, soil scientists, agronomists, fishery specialist, sociologist, environmentalist, economists etc. S/he must have clear idea on using remote sensing techniques in the water resources assessment and must have clear idea on interpretation of modeling results required for environmental study. <u>Job Responsibilities</u> The specific job responsibilities of the Deputy Team Leader-1/ Water Resources Specialist-1 (Specially assigned for Task-H) would include but not necessarily be limited to the followings: • He/She will be responsible for overall task management of the Task-G & H with planning, development, coordination & reporting. • As Deputy team leader of the Screening and Technical and Environmental Auditing, the Water Resources Specialist-1 would be responsible coordinating and integrating the activities of the multi-disciplinary team engaged for the purpose as well as maintaining close contact with all agencies having a stake in the study. • S/he would be responsible for guiding the multi-disciplinary team in the identification of important environmental concerns, identifying the state indicators which influence the environmental concern, identification of the FCD/I subprojects, hydrological and hydraulic impact assessment, and environmental impact assessment including environmental management plan. • Perform any other project related activities assigned by the Project Director and he/she will be liable to the project Director.

K-04: Deputy Team Leader-2 (for task F)	<u>Qualifications and Experience</u> Deputy Team Leader-2(for Task F) should have Masters in Computer Science & Engineering and BSc in Civil Engineering or relevant technical field from a reputed university. PhD in GIS and experience in developing water resources database application development will be given preference. Should have minimum 20 years of experience on development of MIS and GIS applications; should have working experiences as team leader/deputy team leader in GIS related projects. More than five years of experience of leading a group of GIS and IT professionals in a unit/ Division in an organization would be given preferences. Experience of working in water sector with modelling will be given extra privilege. <u>Job Responsibilities</u> The specific job responsibilities of the Deputy Team Leader-2 would include but not necessarily be limited to the followings: • He/She will be responsible for overall task management of the Task-F with planning, development, coordination & reporting. • He/She will be responsible for planning the overall system for updating & implementation of the SiMS-Smart • She/he will attend the meeting related to project as and when required by the Design & Supervision Consultant as well as the PD, PCU-BWDB • She/he will present the output of his task before the client • Perform any other project related activities assigned by the Project Director and he/she will be liable to the project Director.
K-05: Construction Monitoring and Quality Control Specialist	<u>Qualifications and Experience</u> The specialist should have at least a B.Sc. Engineering degree in Civil/Water Resources Engineering. Preference will be given for to a postgraduate degree. The Engineer should have minimum 15 years experience in construction monitoring & quality control of civil works preferably in FCDI/FCD sub-projects. S/he must be computer literate and familiar with relevant programs for this assignment. English ability: Good standard of oral and written English. <u>Job Responsibilities</u> The job responsibilities of the Construction Monitoring & Quality Control Specialist shall include but not be limited to the followings: • Assist the Team Leader/Deputy Team Leader in all construction monitoring of the FCD/FCDI sub-project rehabilitation works including Quality Control aspects of civil works, structures and

	embankments, dredging, etc.; • Constantly visit and monitor the existing works in site; • Collect all data relating to quality of the materials used on site; • Preparation of systems/ways to monitor the works and ensure they are utilized properly; • Monitor the flood conditions, drainage congestion and storm surge effects including salinity intrusion problems; • Ensure the quality of existing types of protection works with respect to durability, stability, cost, suitability and availability of local materials as well as use of imported materials; • Assistance to prepare preliminary design comprising of hydrological and hydraulic aspects; • Recommend for each situation the most appropriate alternative and make corresponding cost estimates; • Organize engineering surveys and geotechnical investigations for construction programs; • Arrange soil investigations in existing or new borrow areas where earth will be used for embankment construction; • Strictly monitor the works as per approved detailed design, specification and tender documents; • Constantly visit the site and ensure the quality & quantity of the works during field execution as per design, specification & contract documents; • During implementation, if any change/modification is required in the prevailing field situation, inform it immediately to proper authority and get necessary approval, if needed. • Perform any other project related works assigned by the Project Director and he/she will be liable to the project Director
K-06: Participatory Water Management Specialist/Sociologist-1	<u>Qualifications and Experience</u> The Participatory Water Management Specialist should have at least M.Sc in Irrigation and Water Management or B.Sc. in Water Resources/Civil Engineering or Master degree in sociology/economics or relevant field with a minimum 10(ten)years relevant experience. S/he must be computer literate and familiar with relevant programs for this assignment. English ability: Good standard of oral and written English. <u>Job Responsibilities</u> The responsibilities of the Participatory Water Management Specialist shall include but not be limited to the followings: • Assist Team Leader/Deputy Team Leader in performing the consultancy services; • Collection and review of data related to institutional setting, NGO's and Community based organizations (CBO) in the Subproject areas; • Carry out study on beneficiaries participation in all stages of project life and suggest institutional framework; • Study the existing institutional framework for O&M and identify the shortcomings; • Prepare institutional framework for project implementation, construction supervision works and O&M and provide guidelines for involvement of WMOs/CBOs in all the activities; • Prepare guidelines for social mobilization activities, motivation

	activities for organizing/motivating beneficiaries (WMOs/CBOs) and formation of WMOs/CBOs; • Preparing training needs assessment of WMOs/CBOs and training schedule for preparing WMOs/CBOs for active involvement from subproject planning to implementation and finally to take the responsibilities of subprojects management including O&M. • Perform any other project related works assigned by the Project Director and he/she will be liable to the project Director
K-07: Environmental Specialist-1	<u>Qualifications and Experience</u> The Environmental Specialist-1 should have M.Sc. degree in Environmental Science or B.Sc. Degree in Civil/Water Resources Engineering with a minimum of 15 years relevant experience. The consultant should have carried out environmental impact assessments related to water resource projects as well as preparation and implementation of an environmental management and monitoring plan. Experience in M&E of environmental aspects of World Bank or any other donor funded project will be an added advantage. S/he will have to be computer literate and familiar with relevant programs for this assignment. English ability: Good standard of oral and written English. <u>Job Responsibilities</u> His/Her responsibilities shall include but not be limited to the followings: • Review and ensure the compliance of the guidelines in the ESMF of the project • Review and update Environmental Management Plan; • Review and clear EAs/EMPs of the Project. • Design and conduct surveys and studies to assess environmental impact of the project. • Formulate grievance process to address environmental and social safeguards issues for adoption by the project; • Assist the project authority to supervise technical studies to monitor key environmental issues; • Prepare proposals for inclusion in construction contracts; • Contribute to regular M&E reports, MTR report and PCR. • Perform any other project related activities assigned by the Project Director and he/she will be liable to the project Director.
K-08: Socio Economist	<u>Qualifications and Experience</u> The Socio Economist should have Master Degree in Economics/Sociology or relevant field. S/he should have minimum 15years relevant experience. S/he will have to be computer literate and familiar with relevant programs for this assignment. English ability: Good standard of oral and written English. <u>Job Responsibilities</u> His/Her responsibilities shall include but not be limited to the followings: • Assist the Team Leader/Deputy Team Leader in executing the components on economic and financial analysis of the project; • Elaboration of the cost estimate incorporating foreign exchange (both direct and indirect) and local cost requirements, contingency amounts, detailed price escalation;

	• estimates on the expected implementation schedule; administration costs and tax and duties shown as separate line items and the method of calculation of these costs; • Estimation of the benefits including profits from extra agriculture production as a result from reduced flood damages, higher cropping intensities and use of higher yielding varieties based on the cropping by agronomist (it will be assessed whether fisheries can provide benefits or only costs); • Estimates for EIRR, FIRR and NPV; • Benefits and costs of each planning option will be estimated based on the with and without project situation; • Comprehensive sensitivity analysis to changes in costs, benefits and implementation time; • Assessment of risk to the viability of the work, (This will include social risks as well as traditional benefit and implementation schedule assumptions); • Review of available published and recorded report, data and information and social/socioeconomic/institutional aspects of the proposed work; • Identification of different income generating activities in the project area including agriculture, fisheries, industry, services etc.; • Identification of different social potential interest group working with the concerned government agencies, NGOs of the area; • Collection and collation of recent information on socio-economic parameters including population, employment, production practices including agriculture, livestock and fisheries, income from farm and non-farm sources, resources endowment, institutional support services, attitude towards project and participation in projects implementation, operation and maintenance and cost recovery process etc.; • Assessment of present livelihood of the households depending on fisheries, navigation and probable effect of the project on these activities; • Identification of basis for livelihood of the poor men and women to be affected by executing the work and the related land acquisition; • Identification of social and community based organizations, NGOs and determine gaps between different interest groups. Suggest for effective interlinked organizational network relation to the project objective; • Arrange group discussion meetings with the stakeholders; and WMOs; • Devising policy and plan for formation of association of interest groups and WMOs with responsibilities and modus operandi with a view to ensuring people's participation in execution and O&M process of the project activities. • Perform any other project related works assigned by the Project Director and he/she will be liable to the project Director.
K-09: O & M Specialist	<u>Qualifications and Experience</u> The O&M Specialist shall have M.Sc degree in Civil/ Water Resource Engineering with minimum experience of 12 years or B.Sc degree in Civil/ Water Resource Engineering with more than 12 years experiences.

	<u>Job Responsibilities</u> • The O&M Specialist will have the overall responsibilities of O&M aspects of the study following the existing Acts, Policies, Guidelines related to O&M activities. • SWOT (Strengths- Weaknesses-Opportunities-Threats) analysis on O&M activities of BWDB. • In order to improve the O&M activities more efficient, more flexible and with clearer responsibilities with an integrated O&M concept focusing on beneficiary participation. • Help in institutional arrangement for the people's participation in O&M and prepare sustainable O&M plans for the subprojects. • Prepare guidelines for O&M, including funding arrangements for FCD/FCDI projects through consultations with beneficiaries and local institutions/organizations; • Assist the WMO Specialist in preparing annual O&M Plan for the WMG; • Prepare guidelines for management and/or execution of O&M activities including recovery of O&M costs from beneficiaries; • Will assist the Team Leader and Deputy Team leader in preparing the O & M Manual of the project intending a guide on planning, implementation and monitoring of the O&M of the water related infrastructures and/or supervising contracting O&M works of the water related infrastructures with the inclusion of beneficiaries participation. • Perform any other project related works assigned by the Project Director and he/she will be liable to the project Director.
K- 10: Design Engineer	<u>Qualifications and Experience</u> The Design Engineer should have at least B.Sc in Civil/Water Resources Engineering degree and 5 (five) years of relevant experience in design of water resources/Civil infrastructures. S/he will have to be computer literate and familiar with relevant programs for this assignment. English ability: Good standard of oral and written English. <u>Job Responsibilities</u> The responsibilities of the Design Engineer shall include but not be limited to the followings: • Assist the Team Leader/Deputy Team Leader in all technical aspects including design of structures and embankments/canals, protective works, pump houses, buildings and other related infrastructures; • Review of existing reports; • Collection and review of all kinds of engineering data; • Preparation of system for computerized design; • Analysis of flood conditions, drainage congestions, storm surge effects and climate change impacts on flood levels and storm surge levels, salinity intrusions etc.; • Assess the capacity of the existing water control structures like

	regulator/sluice, etc. with the consideration of climate change effects. In case of inadequacy recommend for rehabilitation and process of rehabilitation; • Assess the capacity of the existing irrigation canals addressing the climate change effects. • Review benchmark controls and detailed topographic surveys of the irrigation systems; • Develop performance objectives at the tertiary and higher order canals; • Study existing types of protection works with respect to durability, stability, cost, suitability and availability of local materials as well as use of imported materials; • Study improvement of access to all subprojects/polder areas and alternative life-saving measures; • Derive design conditions based on statistical combination of storm surge level, wave height, climate change impact, period and direction; • Optimize location of embankments to be rehabilitated and embankment design considering combinations of seaward face geometry, durability of embankment body and living materials as well as climate change effect; • Prepare detail structural design or review the design of various infrastructures included in the project coordinating with concerned design circle office of BWDB and take appropriate steps to approve it from the Chief Engineer, Design, BWDB. • Prepare a design report to explain rationale and methodology. • Perform any other project related works assigned by the Project Director and he/she will be liable to the project Director
National Non Key Expert	
NK-01: Agronomist	<u>Qualifications and Experience</u> S/he should have at least a Master Degree in Agronomy/Agriculture/Soil Science with minimum 10 years experience in the related field of water use studies, cropping intensity and cropping pattern design, technically, socially, and environmentally viable production plan for cropping scenarios. S/he will have to be computer literate and familiar with relevant programs for this assignment. English ability: Good standard of oral and written English. <u>Job Responsibilities</u> His/Her responsibilities shall include but not be limited to the followings: • Collect and review data, maps, photos, satellite image, previous studies, report on already developed and projects under development; • Assessment of additional data requirement of land and agriculture production and cultural practices; • Assessment of soil and land use status in the project area

	including capability assessment of WMOs working; • Assessment of cropping practices in the project area including input-output mixed and cultural management; • Assessment of HYV technology in the area and its impact on traditional agriculture, land water fisheries, wild life, human resources, etc.; • Assessment of impact of the proposed cropping practices on the land and other ecological balance in the proposed project area; • Assistance to Environmental Expert in developing agriculture related program of EIA; • Assessment of the impact of the project structures on the productivity of land and agriculture and Suggestion on possible remedial measures to incorporate in the project technical and agricultural production planning with a view to minimizing negative impact on ecological balance. • Perform any other project related works assigned by the Project Director and he/she will be liable to the project Director.
NK-02: Fisheries Specialist-1	<u>Qualifications and Experience</u> The Fisheries Specialist-1 should have a Master's degree in Fishery/Zoology with minimum 10 years of experience of working in the field of fisheries development. Experience of working in multi-disciplinary EIA team in an interdisciplinary manner for minimum 5 years is essential for the position. <u>Job Responsibilities</u> His/Her responsibilities shall include but not be limited to the followings: • The Fishery Specialist-1 would be responsible for selecting important fisheries components likely to be impacted by the rehabilitation works, collecting historical data on fisheries for generating the FWOP condition and compare the same with the FWIP condition for assessing impacts of the rehabilitation works on fisheries in the subproject. S/he would be specifically responsible for detecting adverse impacts of the proposed interventions on fisheries resources and suggest mitigation measures for minimizing the impact of the negative impacts. • S/he would also suggest enhancement measures for increasing benefits of the positive impacts in addition to suggesting a fisheries monitoring plan. • Perform any other project related works assigned by the Project Director and he/she will be liable to the project Director.
NK-03: Environmental Specialist-2 (for Task-G &H)	<u>Qualification and Experience:</u> S/he should have a Master's degree in Environmental Engineering/Environmental science/Environmental management or Water resources development/Engineering with about 15 years of working experience of which at least 5 years in conducting EIA/SIA and water management studies of water development projects as a member of multi-disciplinary team of professionals including soil

	scientists, agronomists, fishery specialist, sociologist, environmentalist, economists etc. S/he must have clear idea on using remote sensing techniques in the water resources assessment required for environmental study. <u>Job Responsibilities</u> • S/he would be particularly responsible for covering ecological aspects in the environmental baseline, selection of important ecological components, ecological impact assessment, and environmental management plan including mitigation plan, enhancement plan, contingency plan and environmental monitoring plan with the help of the mid-level environmentalist. • As the Environmental Specialist-2 of the Screening and Technical Audit and Environmental assessment, he/she would represent the Deputy Team Leader-1 / Water Resources Specialist-1 as and when needed. • S/he would be responsible for overall planning and implementing data collection; and coordinating with interpretation on all with the other members of the multi-disciplinary team. • S/he will be specifically responsible for guiding data collection on flora and fauna including the assessment of the impacts of the proposed interventions on the eco-system of the project. • Perform any other project related activities assigned by the Project Director and he/she will be liable to the project Director.
NK-04: Database Specialist(Specially assigned for Task-F)	<u>Qualifications and Experience</u> The Database Specialist should have M.Sc. degree in Computer Science/Computer Science & Engineering/MSc in Geographical Information System/Civil Engineering/Software Engineering/Water Resource Engineering or Masters in Applied Physics & Electronics/Physics or any other related subject. He should have minimum 15 (fifteen) years of experience as a Database Developer/Database Administrator/Software Engineer. Proven experienced of Oracle/Postgre SQL/SQL Server Database for design, development, and implementation. Should have working experience in Geo-database design, development and implementation using ArcGIS. Well experienced in coding and using VB.Net, C# and ASP/ASP.Net. Application knowledge on HTML/DHTML/ Java Script/VB Script with coding experience will be preferred. Knowledge of database architecture and design, administering database server, design new solutions, supervise programmer, system performance tuning, and security management, maintain data storage capabilities are must.

	<u>Job Responsibilities</u> The specific job responsibilities of the Database Specialist would include but not necessarily be limited to the followings: • Supervise data collection and preparing database for SiMS-Smart • Assist Team Leader in data related activities • Updating of Water Management Group (WMG)/Water Management Organization database • Finalize design and develop database including the design and development of Geo-database • Database performance tuning, security and database administration • Perform regular database backup, restore and maintenance • Prepare Database requirements and design reports • Prepare Database Technical Reference manual • Provide database operational training to the Client • Responsibilities are also included for preparing Inception, Interim, Draft Final and Final Report related to the database issues, attend meeting as and when required • Perform any other project related works assigned by the Project Director and he/she will be liable to the project Director.
NK-05: Institutional/ WMO Professional (Specially assigned for Task-G &H)	<u>Qualifications and Experience</u> Institutional/WMO Professional will have at least a Master degree from recognized university with minimum 10 years experience in relevant field. <u>Job Responsibilities</u> The job responsibilities of the Institutional Specialist shall include but not be limited to the following: • Assist Team Leader/Deputy Team Leader in conducting the study; • Collection and review of data related to institutional setting, NGOs and Community Based Organizations (CBO) in the sub-project areas; • Carry out study on beneficiaries participation in all stages of project life and suggest institutional framework; • Study the existing institutional framework for O&M and identify the shortcomings; • Provide assistance in preparing the report; and • Prepare institutional framework for project implementation, construction supervision works and O&M. • Perform any other project related works assigned by the Project Director and he/she will be liable to the project Director.
NK-06: Gender Specialist	<u>Qualifications and Experience</u> S/He will have at least Master Degree in Sociology/Social

	Science/Social Welfare/Economics or relevant field with at least 10 years relevant experience in Gender/ Women-in Development activities. S/he will have to be computer literate and familiar with relevant programs for this assignment. English ability: Good standard of oral and written English. <u>Job Responsibilities</u> • She/He should have capacity and experience in participatory research, participatory identification and design of the project. • She/He should have experience in formulating & implementation of GAP/GALS. • She/He will be looking after the gender aspects of the project under direct supervision of the Team Leader and Deputy Team Leader. • Perform any other project related activities assigned by the Project Director and he/she will be liable to the project Director.
NK-07: GIS Specialist-1	<u>Qualifications and Experience</u> The GIS Specialist-1 should have a B.Sc degree in Urban & Regional Planning or Masters in Geography or any other relevant subject from a reputed university. Individual must have 10 years working experience in the field of GIS. <u>Job Responsibilities</u> The specific job responsibilities of the GIS Specialist would include but not necessarily be limited to the followings: • Prepare GIS task plans for coordinating resources, work assignment and scheduling • Supervise and provide technical support to the GIS personnel and their activities in the project • Providing assistance for development and management of GIS tasks, defining requirements ensuring quality of spatial features and GIS maps. • Analyze geographic relationships among various types of BWDB Subprojects and on-going projects level data • Design and development of geo-database and prepare GIS data processing methodology • Provides GIS-related technical guidance and assistance to the Software Development team members as well as other members in the project • Administrating the GIS development and tracking version control in ArcGIS Server platform • Prepare GIS training manuals, manuscripts and provide GIS training to BWDB officials • Contribute to preparing Inception Report, Interim Report,

	Progress Report, Draft Final Report and Final Report of the project • Perform any other project related works assigned by the Project Director and he/she will be liable to the project Director.
NK-08: Remote Sensing Specialist	<u>Qualifications and Experience</u> The Remote Sensing Specialist should have minimum a B.Sc. in Urban & Regional Planning or Masters in Geography or any relevant subject from a reputed university. The candidate also should preferably have advanced degree in GIS and Remote Sensing. Individual must have 8 years working experience in the field of Remote Sensing. <u>Job Responsibilities</u> The specific job responsibilities of the Remote Sensing Specialist would include but not necessarily be limited to the followings: • Satellite Data procurement and processing • Ortho-rectification and Feature Extraction from Images • Data processing and preparation of geo-database for GIS • Generation of cartographic outputs for the project • Reporting and Presentation • Perform any other project related works assigned by the Project Director and he/she will be liable to the project Director.
NK-09: Water Resources Engineer/ Irrigation Engineer	<u>Qualifications and Experience</u> The Water Resource Engineer should have minimum a B. Sc. degree in Civil/Water Resources Engineering/Agriculture Engineering/Irrigation Engineering from a reputed University. He/She should have minimum 10 years working experience in FCD/FCDI sub-projects, water resources planning and implementation of water/irrigation infrastructures. <u>Job Responsibilities</u> The specific job responsibilities of the Water Resource Engineer/Irrigation Engineer would include but not necessarily be limited to the followings: • Assist the Deputy Team Leader-1 in identification of potential locations for irrigation and drainage structures and its hydraulic parameters. • Identify the problems impacting irrigation-water productivity which need to start with a comprehensive diagnostic exercise, both field-based and desk-based and develop the system performance. • The decision-making process for smallholder modernization is

	described from the perspective of development planners in the 2020 World Bank Follow World Bank Farmer-led Irrigation Development (FLID) Guide: A what, why and how-to for intervention planning • Supervise and monitor the data collection and processing • Contribute to prepare the Inception, Interim, Draft Final and Final Report • Perform any other project related works assigned by the Project Director and he/she will be liable to the project Director.
NK-10: Sociologist-2	<u>Qualifications and Experience</u> S/he should have a Master's degree in Sociology/Anthropology/Economics with more than 12 years of working experience in social aspects of water development projects. Experience of working in multi-disciplinary EIA team in an interdisciplinary manner is essential for the position. <u>Job Responsibilities</u> • S/he would be responsible for covering all social aspects of the screening and environmental audit. • S/he would be responsible for covering the social aspects of the baseline study and selection of important social components, which are likely to be impacted by the proposed rehabilitation works. • S/he would be responsible for guiding in collection of historical social data for generating the FWOP condition and compare the same with the FWIP condition for assessing impacts of the proposed interventions on the important social components in the subproject. • S/he would be specifically responsible for designing and conducting socio-economic surveys including the analysis and interpretation of the data collected through such surveys. • Perform any other project related works assigned by the Project Director and he/she will be liable to the project Director.
NK-11: Mechanical Engineer	<u>Qualifications and Experience</u> The Mechanical Engineer should have at least B.Sc. in Mechanical Engineering or relevant Engineering field and 5 (five) years of relevant experience in mechanical/electrical design of water resources infrastructure. S/he will have to be computer literate and familiar with relevant programs for this assignment. English ability: Good standard of oral and written English. <u>Job Responsibilities</u> The responsibilities of the Mechanical Engineer shall include but not be limited to the followings: • Assist the Team Leader/Deputy Team Leader in all technical aspects including mechanical & electrical design/ remote control

	based operating system design of Water control structures, pumps and other related infrastructural works to make the structures automatically operated(where feasible & applicable).Review of existing related reports; • Collection and review of all kinds of relevant engineering data; • Preparation of system for computerized design; • Analysis of flood conditions, drainage congestions, storm surge effects and climate change impacts on flood levels and storm sure levels, salinity intrusions etc. for preparing mechanical & electrical design, drawing & specification or remote sensing design of Water control structures, pumps and other related infrastructures to make the structures automatically operated. • She/He will coordinate with design Engineer & concerned design circle of BWDB to finalize the mechanical & electrical design/ remote control based operating system design (where feasible & applicable) and take appropriate steps to approve it from the Chief Engineer, Design, BWDB. • Prepare a design report to explain rationale and methodology. • Perform any other project related works assigned by the Project Director and he/she will be liable to the project Director.
NK-12: Construction Supervision Engineer	<u>Qualifications and Experience</u> The Construction Supervision Engineer should have at least B.Sc. degree in Civil/Water Resources Engineering/Irrigation Engineering and 5 (five) years relevant experience in construction supervision. S/he must be computer literate and familiar with relevant programs for this assignment. English ability: Good standard of oral and written English. <u>Job Responsibilities</u> The job responsibilities of Construction Supervision Engineer (the off-farm and on-farm systems, the consultants could consult "What" and "How" chapters of the I&M Guide)shall include but not be limited to the followings: • Assist Construction Monitoring and Quality Control Specialist in all construction monitoring of the works in FCD/FCDI subprojects including quality control aspects of civil works, structures and embankments etc.; • Constantly visit and monitor the existing works in site; • Collect all data relating quality of the materials used in site; • Preparation of system/ways to monitor the works; • Monitor the flood conditions, drainage congestion and storm surge effects including salinity intrusion problems; • Ensure the quality of existing types or protection works with respect of durability, stability, cost, suitability and availability of local materials as well as use of imported materials; • Assist in organizing engineering surveys and geotechnical investigation for construction programme; • Strictly & regularly supervise the construction works as per design and quality manual and ensure the quality & quantity during implementation;

	- Any dispute/delay/problems arises during implementation, inform it to proper authority immediately, and seek necessary assistance. - Perform any other project related works assigned by the Project Director and he/she will be liable to the project Director.
NK-13: Training Specialist	<u>Qualifications and Experience</u> The Training Specialist should have at least B.Sc. degree in Civil/Water Resources Engineering or Master Degree in Sociology/Social Science/Social Welfare/Economics or equivalent degree and at least 5 years of relevant experience in training activities. S/he will have to be computer literate and familiar with relevant programs for this assignment. English ability: Good standard of oral and written English. <u>Job Responsibilities</u> The job responsibilities of the Training Specialist shall include but not be limited to the followings: - Assist the Team Leader / Deputy Team Leader in conducting the training programme. - Carryout training needs assessment considering the objectives of CSAWM. - Design, organize and manage training programs and provide logistical support i.e. arrange venue, training materials etc. in consultation with PD, Team leader/Deputy team leader & concerned persons. - Assist in developing training modules, training materials, and presentations. - Assist in identifying the available resource persons under the modules to carry out the training. - Develop training plan and maintain training calendar. - S/he will be responsible for conducting training for WMOs, community facilitators, BWDB employees and other concerned stakeholders. - Maintaining liaison with PD-PCU, the resource persons, development partner and other concerned stakeholders in connection with training. - Perform any other project related tasks assigned by the Project Director and he/she will be liable to the project Director.
NK-14: GIS Professional-2	<u>Qualifications and Experience</u> The GIS Professional-2 should have a B. Sc. degree in Urban & Regional Planning or Masters in Geography or any other relevant subject from a reputed university. Working experience in both commercial and open-source GIS software such as Arc GIS and Quantum GIS will be an added advantage. Individuals must have 4 years working experience in the field of GIS. <u>Job Responsibilities</u> The specific job responsibilities of the GIS Professional-2 would include but not necessarily be limited to the followings: - GIS Data processing and preparation of GIS layers and Maps - GIS data verification and validation and GIS database



	preparation • Assist GIS Specialist for design and development of geo-database and follow the guidance of GIS specialist for GIS database preparation • Analyze geographic relationships among various types of BWDB Subprojects and on-going projects level data • Generation of cartographic outputs for the BWDB projects/sub-projects • Supervise and coordinate the field data collection • Data processing and preparation of Maps • Generation of cartographic outputs for the project • Perform any other project related tasks assigned by the Project Director and he/she will be liable to the project Director.
NK-15: Participatory Water Management Specialist-2	<u>Qualifications and Experience</u> The Participatory Water Management Specialist-2 should have at least B. Sc. degree in Agriculture /Water resources/Civil Engineering or relevant field and at least 5 years relevant experience. S/he will have to be computer literate and familiar with relevant programs for this assignment. English ability: Good standard of oral and written English. <u>Job Responsibilities</u> The job responsibilities of the Participatory Water Management Specialist-2 shall include but not be limited to the followings: • Assist the Participatory Water Management Specialist in conducting the study; • Collection and review of data related to institutional setting, Community based organizations (CBO) in the subproject/polder areas; • Carry out study on beneficiaries participation in all stages of project life and suggest institutional framework; • Study the existing institutional framework for O&M and identify the shortcomings; • Provide assistance in preparing the draft feasibility report; • Prepare institutional framework for project implementation, construction supervision works and O&M. • Perform any other project related tasks assigned by the Project Director and he/she will be liable to the project Director.
NK-16: Database Programmer/Data Analyst	<u>Qualifications and Experience</u> The Database Programmer/Data Analyst should have at least a Bachelor Degree in Computer Science & Engineering/Computer Science or relevant field and 5 years relevant experience in Data Analysis. English ability: Good standard of oral and written English.

	<u>Job Responsibilities</u> The responsibilities of the Database Programmer/ Data Analyst shall include but not be limited to the followings: • Assist Team Leader/Deputy Team Leader/Deputy Team Leader-1/Deputy Team Leader-2 in data analysis and providing report as per needs • Develop and implement databases, data collection systems, data analytics and other strategies that optimize efficiency and quality; • Acquire data from primary or secondary data sources and maintain databases/data systems and retrieve, process, and analyze the data related to project activities; • Data analysts will develop analysis and reporting capabilities; • Work with the consulting Authority & Project authority to prioritize business and information needs; • Provide assistance in preparing different project related reports; • Perform any other project related works assigned by the Project Director and he/she will be liable to the project Director.
NK-17: MIS Professional (Specially assigned for Task-G &H)	<u>Qualifications and Experience</u> He/She should have a Master degree in Computer Science and Engineering/Computer Science with 5 years of relevant work experience. He/She must have working experience in application of GIS software. <u>Job Responsibilities</u> • Establish linkage of model results/relevant results and RS data with environment, ecological and socio-economic monitoring results; • Analyze the monitoring data and create a MIS for future updating of the results; • Mapping of socio-economic, environmental and ecological monitoring information and the change. • Perform any other project related works assigned by the Project Director and he/she will be liable to the project Director
NK-18: Software Engineer(Web and GIS Development)(Specially assigned for Task-F)	<u>Qualifications and Experience</u> The Software Engineer (Web and GIS Development) should have minimum a B.Sc in Computer Science/Computer Science & Engineering/Software Engineering/ Information and Communication Engineering (ICE) or Masters in Applied Physics & Electronics/Physics or any computer related subjects. He/She should have at least 5 years' experience as a Software Engineer or Software Developer using GIS and Web Technologies. He should be well

	experienced in Web application design, development, and implementation. He should have skills in coding and using VB.Net, C# and ASP/ASP.Net, HTML/DHTML/ Java Script/VB Script, jQuery, AJAX, Angular JS, Bootstrap, HTML5, CSS3 etc. GIS based web development using Arc GIS Server platform, Oracle database system, knowledge of handheld smart device solutions using Android, knowledge of Google Earth/Map APIs for customizing Google Earth/Map. <u>Job Responsibilities</u> The specific job responsibilities of the Software Engineer (Web and GIS Development) would include but not necessarily be limited to the followings: • Incorporate data in SiMS-Smart and validate for correct outputs • Programming for updates and incorporation of new facilities • Editing/debugging SiMS-Smart codes • Training to BWDB officials on operation of SiMS-Smart • Perform any other project related works assigned by the Project Director and he/she will be liable to the project Director
NK-19: Software Developer(Web and mobile) (Specially assigned for Task-F)	<u>Qualifications and Experience</u> The Software Developer (Web and Mobile) should have minimum a B.Sc degree in Computer Science/Computer Science and Engineering/IT/CIS or computer relevant fields. He/She should have at least 5 years experiences in the field of software development specially web based and mobile platform, both web-based and mobile based solution architecture, software development, coding/programming, data modelling and database design, UI/UX etc. Proven working experience in Android development; experience with Android SDK; experience working with remote data via REST and JSON; experience with third-party libraries and APIs; working knowledge of the general mobile landscape, architectures, trends, and emerging technologies; solid understanding of the full mobile development life cycle. <u>Job Responsibilities</u> The specific job responsibilities of the Software Developer (Web and mobile) would include but not necessarily be limited to the followings: • Update the SiMS-Mobile as required. • Develop Data collection Mobile Apps. • Download data from Smart-Devices and upload to SiMS-Smart Database • Other software related works

	Perform any other project related works assigned by the Project Director and he/she will be liable to the project Director
NK-20: Software Tester (Specially assigned for Task-F)	<u>Qualifications and Experience</u> The Software Tester should have minimum a B.Sc. degree in Computer Science/Computer Science & Engineering/Software Engineering/Information and Communication Engineering (ICE) or any computer related subjects. He/She should have at least 5 years' experience as a Software Tester using software application including web GIS and Mobile Apps. <u>Job Responsibilities</u> - Preparation of test plans - Reviewing software requirements and preparing test scenarios. - Executing tests on software usability. - Analyzing test results on database impacts, errors or bugs, and usability. - Preparing reports on all aspects related to the software testing and preparation test report. - Perform any other project related works assigned by the Project Director and he/she will be liable to the project Director
NK-21: Environmental Expert-3	<u>Qualifications and Experience</u> He/She will have Bachelor degree (4 Years) in environmental Science/Forestry with 2-3 years of work experience. <u>Job Responsibilities</u> - Assist the Environmental Specialist-1 & Team members of different disciplines in environmental activities. - Assist in review and update Environmental Management Plan. - Assist in review and clear EAs/EMPs of the Project. - Assist in Design and conduct surveys and studies to assess environmental impact of the project. - Assist in formulate grievance process to address environmental and social safeguards issues for adoption by the project; - Assist the project authority to supervise technical studies to monitor key environmental issues; - Perform any other project related works assigned by the Project Director and he/she will be liable to the project Director
NK-22: Fisheries Expert-2	<u>Qualifications and Experience</u> He/She will have Bachelor degree (4 Years) in Fisheries or equivalent degree with 2-3 years of relevant work experience. <u>Job Responsibilities</u> - He/she will assist the Team members of different disciplines in fisheries activities. - Collecting historical data on fisheries for generating the FWOP

	condition and compare the same with the FWIP condition for assessing impacts of the rehabilitation works on fisheries in the subproject. • Assist in detecting adverse impacts of the proposed interventions on fisheries resources and suggest mitigation measures for minimizing the impact of the negative impacts. • S/he would also suggest enhancement measures for increasing benefits of the positive impacts in addition to suggesting a fisheries monitoring plan. • Perform any other project related works assigned by the Project Director and he/she will be liable to the project Director.
NK-23: Civil Engineer(Specially assigned for Task-G &H)	<u>Qualifications and Experience</u> He/She will have B.Sc in Civil/Water Resources/Agriculture engineering from any reputed university with 2-3 years of work experience. <u>Job Responsibilities</u> • He/she will assist the Team members of different disciplines of the Task-H in identifying the Civil & Water related infrastructures and its functionalities. • Perform any other project related works assigned by the Project Director and he/she will be liable to the project Director
NK-24: Agriculture Engineer(Specially assigned for Task-G &H)	<u>Qualifications and Experience</u> He/She will have B.Sc in Civil/Water Resources/Agriculture engineering from any reputed university with 2-3 years of work experience. <u>Job Responsibilities</u> • He/she will assist the Team members of different disciplines of the Task-H in identifying the irrigation infrastructure and its functionalities. • Perform any other project related works assigned by the Project Director and he/she will be liable to the project Director
National Non Key Professional	
NK-25: Surveyor	<u>Qualifications and Experience</u> The Surveyor should have a Diploma in Civil Engineering or related surveying field and at least 5 years relevant experience. He should be full conversant with the use of modern survey equipment like Total Station, RTK GPS etc. S/he will have to be computer literate and familiar with relevant programs for this assignment.

	<u>Job Responsibilities</u> • Conduct various Survey work-land level survey, bank line survey, cross section & bathymetry survey. • Water Resource Infrastructure condition survey using GPS devices • Project/sub-project boundary alignment survey using GPS devices • Assessment of various digital data; • Establishment of Bench Mark • Prepare necessary maps for project reporting. • Assist in construction supervision. • Data processing of survey results • Perform any other project related tasks assigned by the Project Director and he/she will be liable to the project Director
Technical and Administrative Support staff	
01. Office Manager	<u>Qualifications and Experience</u> Master's in Business Administration, Finance, Accounting or Management or related field from a recognized university with Minimum of 5 years Experience in administration & finance and operations and reporting functions. Demonstrable proficiency with Microsoft Word, Excel, PowerPoint, Access etc. Good communication skills, both verbal and written, in English and Bangla. <u>Job Responsibilities</u> • Maintaining all official records. • Handling all financial matters. • Staff management, leave records, etc. • Supervise the project vehicles, drivers and messengers as per instruction of the Management. • Timely submission of documents, official letters of correspondence of client. • Advise and assist the staff, experts and consultants on all issues of allowances, salary advances, travel claims and other financial matters; authorize payments due for claims and services. • Any other tasks assigned by the Consultant Management.
02. Office Engineer-1	<u>Qualifications and Experience</u> The Office Engineer-1 should have B.Sc. in Civil/Water Resources Engineering/Electrical & Electronics Engineering degree or any other Engineering degree and have experiences in office related work. S/he will have to be well conversant with information technology supporting office work and familiar with relevant programs for this assignment. English ability: Good standard of oral and written English.



	<u>Job Responsibilities</u> • Maintain organized and detailed construction files, project records, design related documents etc. • Attend project meetings, record meeting information and prepare meeting minutes. • Help in tracking, documentation and managing project issues and conditions. • Help to oversee and review daily field inspection & supervision reports using IT related supports. • Help consultant management in coordination, control, decision making and communication with the help of IT. • Assist Project Manager/Resident Engineer with payment requisition review. • Help the design engineers to expedite the design preparation process through liaison with design office, field office and concerned stakeholders. • Assist in Construction Supervision • Help in land acquisition & resettlement activities liaison with PCU of CSAWM. • Perform any other project related activities assigned by the Project Director and he/she will be liable to the project Director. • He/She will be liable to the PD,PCU.
03. Office Engineer-2	<u>Qualifications and Experience</u> The Office Engineer-2 should have B.Sc. in Civil/Water Resources Engineering degree with minimum 2 years relevant experiences or Diploma in Civil Engineering with at least 10 years experiences in Civil/Water Resources Engineering works in field & desk office. S/he will have to be computer literate and familiar with relevant programs for this assignment. English ability: Good standard of oral and written English. <u>Job Responsibilities</u> • Maintain organized and detailed construction files, project records, design related documents etc. • Attend project meetings, record meeting information and prepare meeting minutes. • Help in tracking, documentation and managing project issues and conditions. • Help to oversee and review daily field inspection & supervision reports. • Prepare monthly project status reports. • Assist Project Manager/Resident Engineer with payment requisition review. • Help the design engineers to expedite the design preparation process through liaison with design office, field office and

	concerned stakeholders. • Assist in Construction Supervision • Help in land acquisition & resettlement activities liaison with PCU of CSAWM. • Perform any other project related activities assigned by the Project Director and he/she will be liable to the project Director. • He/She will be liable to the PD,PCU.
04. Auto CAD Operator	<u>Qualifications and Experience</u> Diploma in Auto CAD/ Architecture/ Civil with 3-6 years experiences in Auto CAD design preferably in Civil/Water Resources infrastructures. <u>Job Responsibilities</u> • Work with Engineers to prepare plans, sections, elevations, detailed construction drawings in Auto CAD. • Practical experience in CAD Software and knowledge of Engineering & Construction. • Prepare drawings used in the layout, construction, and operation of systematic processes. • Interact with engineers and designers to quickly and accurately create drawings during design process. • Fill in technical details using drawings, rough sketches, specifications, and calculations made by engineers and surveyors • Perform any other project related tasks assigned by the Project Director and he/she will be liable to the project Director.
05. Computer Software/hardware Maintainer	<u>Qualifications and Experience</u> Minimum Diploma in Computer Science, engineering or relevant computer field with 4-6 years experience in installation, maintenance and repair computers and networks. He/She will be the one to ensure that adequate IT infrastructure is in place and is used to its maximum capabilities. <u>Job Responsibilities</u> • Set up hardware and install and configure software and drivers • Maintain and repair technological equipment (e.g. routers) or peripheral devices • Install well-functioning LAN/WAN and other networks and manage components (servers, IPs etc.) • Manage security options and software in computers and networks to maintain privacy and protection from attacks • Perform regular upgrades to ensure systems remain updated • Troubleshoot system failures or bugs and provide solutions to restore functionality. • Perform any other project related tasks assigned by the Project

	Director and he/she will be liable to the project Director.
06. Data Collection, Entry, Digitizing Assistant(for Task-F)	<u>Qualifications and Experience</u> He/She should have minimum Bachelor degree with at least 2 years' experience in handling ArcGIS, QGIS, Google Earth, Microsoft Excel, Microsoft Access or such kind of database S/W etc. <u>Job Responsibilities</u> • He/She will work under the guidance of Team leader/deputy team leader-2 and responsible consultants of the task regarding data collection, data entry and handling of ArcGIS, QGIS, Google Earth, Microsoft Excel, Microsoft Access or such kind of database S/W etc. • Perform any other project related tasks assigned by the Project Director and he/she will be liable to the project Director
07. Office Accountant	<u>Qualifications and Experience</u> Minimum Bachelor Degree in Accounting /Commerce or related field with at least 3 years experiences in Accounts and audits. Experiences in any reputed organization (preferably in consulting firms) will be preferred. <u>Job Responsibilities</u> • Ensure that all transactions are captured on time and accurately; • Maintain bills and invoices to ensure all transactions are posted on time; • Maintaining documentation of all bills and vouchers; • Maintain audit, finance and accounts; • Prepare all annual financial statements; • Good operating skills of Microsoft Office (especially MS Excel and MS Word) with software operation and reporting will be treated as essential skills; • Maintain strong relationships with other stakeholders to make smooth information and reporting; • Maintain quarter-end account reconciliations; and • Any other tasks assigned by the Consultant Management
08. Word Processor	<u>Qualifications and Experience</u> Minimum Higher Secondary Certificate(HSC) with minimum typing speed/word processing speed per minute 30 English words and 25 Bengali Words. <u>Job Responsibilities</u> • Typing of Bangla and English given subject matters. • Entry of data and other inputs given.
09. Office Assistant	<u>Qualifications and Experience</u> Minimum Higher Secondary Certificate (HSC) with experience of various types office assisting activities. <u>Job Responsibilities</u> Perform various types of office assisting activities as per instruction of the office management.
10. MLSS	<u>Qualifications and Experience</u> Minimum Secondary School Certificate(SSC) with experience of

various types office assisting activities ,

Job Responsibilities

Perform various types of office assisting activities as per instruction of the office management.

9. Reporting Requirements

Based on the activities and responsibilities described earlier the reports and deliverables will be as follows:

- i) Inception Report
- ii) Monthly Progress Report
- iii) Semi Annual Progress Report
- iv) Annual Report
- v) Midterm Review Report
- vi) Draft Project Completion Report
- vii) Project Completion Report
- viii) Any other Report if necessary.
- ix) Any other report if necessary.

Reporting requirements will be delivered & submitted in both hard and soft copy. There will be arranged Inception report presentation in BWDB before finalization it, a national workshop after submitting draft project completion report and any other presentation or workshop as per requirement.



Details of Task-F

Updating & implementation of Sub-Project Information Management System-Smart (SiMS-Smart) and limited scale morphological modelling as required for erosion protection and dredging of the morphologically critical areas of the selected sub projects

1. Introduction

The project will require updated data/information in organized manner and some software tools operate on the data to produce outputs to meet the project objectives. In such case under the Water Management Improvement Project (WMIP) the developed *SiMS-Smart* (Subproject Information Management System-Smart) of South-Eastern Zone of BWDB will help by providing information and processing capabilities. Under proposed project the developed system will require extending to the selected subprojects for rehabilitation and incorporate new database and tools specifically for this project. To support the project, extending the *SiMS-Smart* will be a necessary and positive step in binding the digital technologies for information storage, analyses and online data access and visualization.

The project may also require numerical morphological modeling study to support the erosion protection and dredging activities of the rivers vulnerable due to morphological changes. The modelling study will be done by the consultant as per requirement on consensus basis.

The overall objective of the *SiMS-Smart* is to support BWDB officials in planning, budgeting, estimating monitoring the rehabilitation/improvement works and O&M of all types of projects or Subprojects. The *SiMS-Smart* extends its capabilities by utilizing Smart devices (Mobile, Tablets), IP-Camera, Skype, SMS integrated with web GIS and Oracle database.

The overall framework of the *SiMS-Smart* showing its dataflow and modules is presented in framework below.

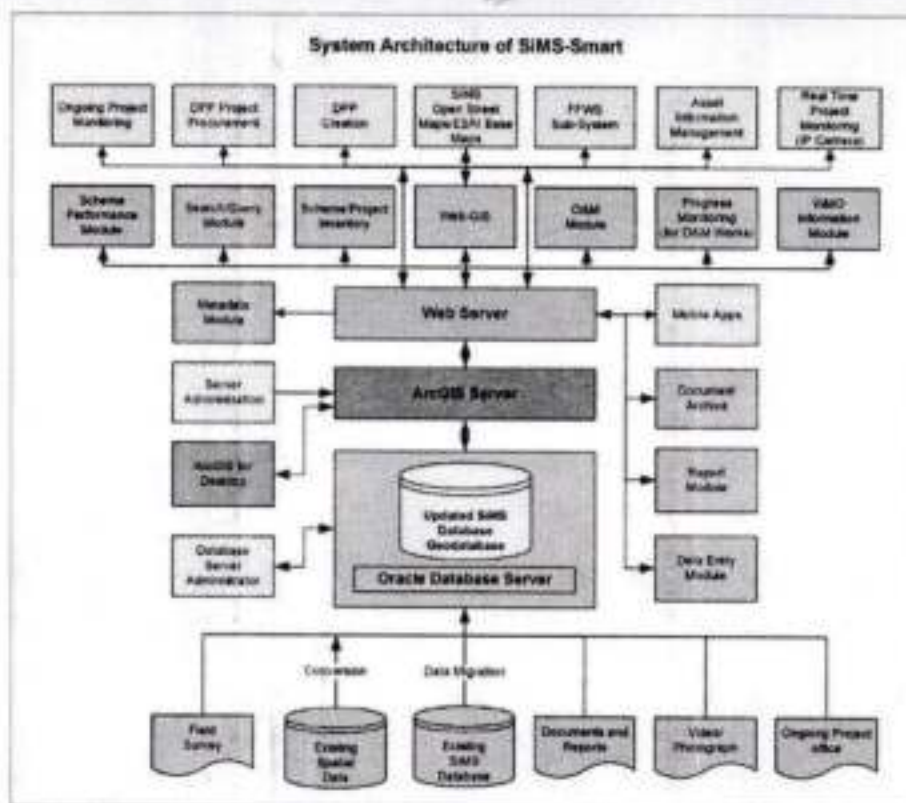


Figure -1 SiMS-Smart Architectural Framework

2. Tools & Module under SiMS-Smart

The present *SiMS-Smart* consists of numbers of tools and modules, those are described below:

Web GIS Module enables user to visualize BWDB Subprojects/Projects with physical features along their detail information with the advanced capabilities of web GIS with online maps such as ESRI base maps as background. The module provides facilities for selection, Scale change, off/on layers, zooming facilities, feature identification, spatial queries etc. It may require substantial improvement for presenting projects/sub-projects using drill down of BWDB Zone, Circle and Divisional jurisdiction in GIS maps

Subproject/Project Inventory Database for maintaining all information about individual completed and ongoing subprojects/projects including all infrastructures with design and as built data.

Search/Query Module is a robust Web GIS based Search/Query module, enables user to perform and build search and query for information retrieval of Subprojects/Projects features. Currently, it is found robust and running well, and may require small improvement.

O&M Module enables user to store O&M data of BWDB completed projects including quantity estimates of embankment and Canal earthwork volume, schedule of rates, cost estimates, budgets, work selections etc. for O&M or ADP headed BWDB works. Existing O&M Module will require substantial improvement.

The schedule of rates database is essential to O&M module. Mode of sharing or integration of schedule of rates database will require more consultation of the project authority with relevant BWDB Design Circle.

In SiMS-Smart, currently there is a tool to import and modify schedule of rates through excel file and manual entry/modification facility. This facility needs to be improved/upgraded in consultation with relevant BWDB officials.

Monitoring Module enables user to store and maintain annual O&M implementation information for individual subprojects/projects and monitor the progress towards the targets and completion of O&M works. This module extends for monitoring the progress of BWDB ongoing projects under ADP head. This module also includes the real-time monitoring of project activities through IP-Camera from remote location. This module requires substantially improvement under this project.

BWDB has been receiving supports from outside in improving this module and has already developed a sub-module for presenting monthly progress of BWDB ongoing and O&M project works for the board meetings.

SiMS Mobile enables user to carry out works beyond office and allows to vide information and data collection. Data collection comprises filling table, capture photo & video and GPS locations for the sites. The collected field data/information can directly be registered into the SiMS-Smart database server.

Document Archive enables users to store, retrieve and maintain all kinds of document such as project documents, reports, drawings, publications, journals and appraisal reports etc.

WMO Information Module stores and maintains Water Management Organization related information such as organization, status, membership, constitution, organization framework, meeting schedules and information and members responsibilities to BWDB Subprojects and projects.

BWDB is already developing a WMO application in detail under a separate project named SAIWRPMP-AF with ADB finance. That application will be connected/integrated with SiMS-Smart under this project and upgraded, if required. BWDB ICT directorate & SAIWRPMP-AF project will provide required support in this integration process.

Subproject Performance Module can evaluate the agricultural, socio-economic, environmental and technical performance of subprojects or projects based on some pre-defined set of performance indicators. The baseline and or annual indicator's parameters data can be entered through this web enabled module.

Under this project, the performance indicator parameters and their scores will be reviewed. More indicators may be included. This would require more discussions with the project authority.

Flood Forecasting and Warning Sub-System enables user to get river flood information against project's or sub-project's physical features with relation to the nearest FFWC river water level gauge.

Design Level of Embankment/ Structure is also shown to realize the status of threat for corresponding embankment or structure during flood season.

The improvement under this project will consider design level, danger level/critical levels of embankments and other structures.

BWDB Asset Information Management System (AIMS) enables BWDB to ensure the achievement of the utmost benefit from the resource invested against fixed and moveable assets of BWDB. AIMS comprises of three sub-system (i) Key Asset Information System Module; (ii) Cadastral/land Information Module; and (iii) Instrument & Vehicle Management Module.

- (i) **Key Assets Module** includes inventory of different types of Key assets such as BWDB office and Residential buildings, allotted officers and staffs, and other assets such as house-keeping appliances, electric and electronic appliances, office furniture, Gas and Electric meters, connecting wire and cables, pipes, masonry items, machinery tools and accessories etc. Relevant database will be populated by the BWDB provided information.
- (ii) **Cadastral/land Information Module** stores and maintains BWDB land information of different types of acquired and Khas lands on which different types of BWDB establishments are located such as office and residential buildings, physical features such as Embankments, Canals, Hydraulic Structures, Protection Works and other establishments. BWDB has developed a separate Land Information Database. This section will be covered under that project.
- (iii) **Instrument & Vehicle Management Module** enables user to maintain a web-based inventory of BWDB owned Instruments and Vehicles. The database could be populated using the provided data for this project. For vehicle tracking, a readily available commercial product might be used by BWDB separately.

Report Module enables user to generate various types system generated pre-formatted reports for different purposes. Reports can be generated through the execution of each modules.

Metadata Module A Web-enabled meta-data system enables user to present the availability and status of data in SIMS Smart System along with a limited public access to strategic information for top policy and decision makers.

3. **Activities to be Provided under SIMS-Smart :**

The SiMS-Smart developed for South-Eastern Zone of BWDB will be used and further updated to comply with the requirements of the CSAWM. It is necessary to implement/update *SiMS-Smart* of the selected sub-projects in all the Zones of BWDB, with their updated Sub-projects/Projects level information including detail data, maps and drawings of physical features and other BWDB establishment. The *SiMS-Smart* will be used and further updated to comply with the requirements of the proposed project "Climate-Smart Agriculture and Water Management Project (CSAWM)". In this connection, new software modules and updating of the database will be required.

Under this task, the consultants shall extend the SiMS-Smart to other BWDB zones with further enhancements in line with the objectives and activities of the proposed study.

The specific activities of this task are:

- Collect data from BWDB offices and prepare a comprehensive database for *selected 19 subprojects* of BWDB and integrate in *SiMS-Smart*
- Prepare GIS maps of Sub-project infrastructures and integrate in SiMS-Smart
- If required, BWDB may install IP-Cameras for Real-Time Monitoring at key locations at their own. This study will integrate those IP-Cameras in SiMS-Smart if the APIs of those IP-Camera software are available and support the access.
- Capacity building of BWDB officials and staffs through trainings.

The following Services to be performed under this Task :

- Collection of Sub-project/Project information including documents, maps, embankments, canals, protective works (design data and drawings, reports). The consultant will collect the above information from the respective BWDB offices. The Hydraulic Structure data will be integrated from the existing Hydraulic Structure Inventory System of the BWDB which was surveyed during 2017.
- GPS Survey of the sub-projects to collect conditional information of embankment, protective works, canals of the project/subproject.

The conditional information of embankment, canals and protective works will be obtained from BWDB offices, if available. Otherwise, the condition (in qualitative measure 'vulnerable') shall be visually surveyed using GPS by the consultant with assistance from BWDB field offices.

- Collect WMO information from BWDB office.
 - The developed WMO Registration & Irrigation Management System Software of BWDB should be linked/integrated in this module. BWDB ICT directorate will provide required support with data and access to the developed system.
- Prepare GIS maps of the sub-project/project infrastructure (embankment, structure, protective works, and other interventions)
 - Relevant BWDB offices will provide the project boundaries, embankment, protective works, canals, and other feature maps in digital or hardcopy form which will be converted into GIS maps and integrated into the SiMS-Smart database. The Project boundary will be provided by the respective BWDB offices.
- Prepare database of sub-project information collecting from relevant BWDB offices and upload into the SiMS-Smart database.

- Integration of IP-Camera for real time monitoring: BWDB may install IP-Cameras for Real-Time Monitoring at key locations at their own. This study will integrate those IP-Cameras in SiMS-Smart if the APIs of those IP-Camera software are provided and support the access.
- Upload the BWDB Asset (Vehicle, office, equipment etc.) data into the relevant database of the SiMS-Smart as provided by the BWDB.
- Establish relation with FFWC gauges.
- Develop User's manual and Technical references of the SiMS. The manual shall include step-by-step, easily comprehensible instructions and supports to the user in operating the various modules of SiMS.

The new enhancements in SiMS-Smart database and modules will be:

- Data on poverty, demography, socio-economy from secondary data sources, such as, BBS. Secondary data from BBS on poverty, demography, socio-economy will be uploaded into the SiMS-Smart. The project authority will provide required support to collect data from BBS through G2G channel.
- Integrate topographies, land use, physical features like roads, bridges, rivers, canals from available secondary sources.
- Integration of Fisheries information with maps and aquaculture data—as available from secondary sources.
- Integration of agricultural land use from available secondary data.
- Integration of Intervention plans with locations as provided by BWDB.
- Incorporation of the Climate change data as provided by the project authority.
- Incorporation of SIA, EIA, and EMP data as provided by BWDB.
- Updating the performance evaluation module with climate change effects.
- Multi Criteria Analysis (MCA) module for ranking the sub-projects and visualization in web map.

After populating the *SiMS-Smart* with recent data and updating as mentioned above, the system will be used for MCA for prioritizing the selected sub-projects to be undertaken for implementation under CSAWM.

Technology transfer through trainings to BWDB officials (minimum 7 officials from each zone) will also be done.

The services under this Task might require adjustment based on the project demand and situation during implementation of the project.

4. Expected Outputs

Expected deliverables after implementation of SiMS-Smart in selected 19 sub-projects are:

- Updated Sub-Project Inventory Database which shall have information below:
 - a) should include the project relevant information about physical infrastructure along with design parameters of sub-projects.

b) shall include Hydraulic Structure, Canal/Khal/Channel, Embankment and Riverbank Protection works.

- Sub-project features in GIS maps linked with attributes as parameters within SiMS-Smart
- Enhanced database with data/information/documents as described in the Scope of Works above.
- Updated performance evaluation module with climate change effects
- MCA module for ranking the sub-projects and visualization in web map
- Zone specific mobile Apps for monitoring the information and data collection
- Working SiMS-Smart, with required updates
- Archived documents, drawings and photographs
- Updated *SiMS-Smart* User manual/operational manual, database technical reference manual if required, *SiMS-Smart* Video Tutorials

Provide Training to BWDB officials minimum 7 from each relevant (to 19 sub-project) zone.

Details of Task-H

Screening and Technical & Environmental Auditing of the BWDB selected sub- projects including preparation of Subproject wise Environmental & Social Impact Assessment (ESIA).

1. Introduction:

This Task needs to assist in carrying out Technical Audit and Environmental Assessment of exiting medium and large BWDB subprojects, following EMF of the project, under the overall guidance of PCU.

The main activity of this Task is to assist confirmatory screening of the selected FCD/I sub-projects that will be taken up in cluster as well as individual for rehabilitation/improvement under the project. This objective would be achieved by: (i) review of initially prepared short listed of FCD/I sub-projects, which fit into the NWMP, based on the initial hydrological, hydraulic and environmental impact assessment; (ii) assessment of their physical, hydrological, and hydraulic impacts, and their environmental consequences of a single or a cluster of FCD/I sub-projects within the respective hydrological region as defined in the NWMP including inter-regional impacts of the sub-projects; (iii) assessment of physical and hydrological and its environmental consequences of selected individual sub-projects due to the proposed modifications under R&I works and operational procedures thereafter, and most importantly (iv) integration of the Environmental Management Framework (EMF) with the PSM approach.

The Environmental Management Framework-EMF has identified the corresponding EMF activities to be implemented during the PSM process. The EMF contains a table indicating the environmental management activities necessary at every step of the Participatory Subproject Cycle Management process. The environmental activities would be carried out as an integral part of the PSM process.

2. The Services to be performed under this task are as follows:**Major Activities**

- a. Identifying the important environmental concerns specific to the hydrological region under consideration. The Environmental Management Framework (EMF) will provide the basis for the environment consultant. The Draft Development Strategy (DDS) of the NWMP has provided comprehensive environmental profiles for each of the hydrological region, which will guide to identify the important environmental concerns for each of the hydrological regions and preparation of a review list of selected FCD/I subprojects.
- b. Identifying the state indicators of the water resources system, which influence the environmental concerns. Study of past study reports, discussion with the people and specialists will guide the study team to identify the state indicators.
- c. Review the Identified FCD/I sub-projects within the Hydrological region. The reviewed CSAWM sub-projects database will provide a comprehensive information source about various FCD/I sub-projects. The O&M Divisions of BWDB will provide additional information, if required.
- d. Assessment of initial Identification of hydrological and hydraulic impacts of the cluster of FCD/I falling in the same hydrologic boundary considering climate change impact. The Multi Criteria Analysis (MCA) will be used to find the changes to the state indicators of water resources system due to a single or a cluster of subprojects in the regional context.



- e. Environmental impact assessment considering climate change impact on the basis of changes to the state indicators being computed by MCA. The National Water resources Database (NWRD), National Agriculture Database, and the National Fisheries Resources Database (NFRD) will be the main data sources. Additional data for environmental impact assessment will be collected from various agencies as required.
- f. Work on selected FCD/I sub-project that fit to Sub-project selection criteria considering climate change impact.
- g. Review the selected FCD/I sub-projects that fits to the regional plan and the PSM principle can be applied to the sub-projects. Rehabilitation and Improvement to a sub-project needs this type of supplementary services. However, in case of need for further scrutiny, a detailed impact assessment of individual sub-projects for its inter- and intra-sub-projects impact would be determined using this TA, depending upon the modification of design and operation procedure suggested under the R&I work. Any appropriate Decision Support System or other programming software can be used in conjunction with the detailed impact assessment to yield better solution in minimizing the negative impact. The standard EMF would be the guiding principle for the final selection of the design parameter.
- h. The consultant will help and facilitated to get environmental clearance of the Department of Environment (DOE) of each of the selected sub-projects to be rehabilitated under CSAWM.
- i. Prepare Social Impact Assessment (SIA) of the Subprojects under CSAWM.

3. Approach/ Modality

At each stage of PSM, the approach/modalities will be followed suggested in the EMF.

4. Expected outputs

The expected outputs described below shall be completed within a period of twenty eight months. Key reporting requirement follows:

Reports	Time /Month
Inception Report	Second month
Screening of Sub-Projects (Batch wise)	After two months
Quarterly Progress Reports	By third week of next month ending each quarter
Annual Progress Report	Yearly
Report on Environmental and Social Impact Assessment (ESIA) including EMP for the selected FCD and FCDI sub-project	One ESIA Report on each sub-project selected for rehabilitation/improvement/ operation and maintenance.
Training of WMOs of the selected sub-projects for rehabilitation/improvement.	After completion of ESIA of individual sub-project

Reports shall have to be submitted in both hard and soft copy.

WMO Development Process including WMO-managed Agriculture, Fishery, Livestock and other Livelihood Interventions (Sub Project Cycle)

STRATEGY

WMO formation and strengthening or its organizational development are not separated from WMO-managed activities/interventions like operation and Maintenance (O&M) of infrastructure, agriculture, fishery, livestock and other livelihood activities. WMO development is treated as a "demand-driven" evolutionary process. This means: "WMOs (primarily WMGs and WMAs) will learn-by-doing through organized collective action". The type, number / scale and variety of collective activities would primarily depend on: a) the extent to which the activity contributes to members' income, b) the stage of development of a particular WMO (see **Appendix-1**) as well as, c) the services provided by Government agencies (at the infant stage of WMOs) and higher-level organizations¹.

WMO-managed collective action may begin with simple but "quick yielding" activities which would attract direct beneficiaries. Such activities at the initial stages would "unite/bind" them together and also provide a good opportunity for beneficiaries to "identify" beneficial leaders. Organized collective action such as purchasing inputs for fishery or farm production or group nursery/fingerling culture (organized through an informal committee) coupled with convincing explanation by the Facilitator (whom the beneficiaries would treat as a "friend"/ encouraging companion") on project's novel features like planning with beneficiaries, participatory infrastructure development, integrating water management and O&M with agriculture, fishery etc activities and apart from all, WMO rights responsibilities and benefits to collective would help beneficiaries to accept project's strategy and process and "form" sustainable WMGs with good leaders. They will realize the importance of sub committees and division of responsibilities for expanded collective action, and, as water management is the key to agriculture, fishery, livestock etc activities it would become easier for the Facilitator to motivate the beneficiaries to undertake O&M responsibility and contribute up-front. These WMGs would be federated up to WMAs once the beneficiaries realize the limits of WMG and the need for a parental organization. During this process, WMOs will be organizationally developed". We will not conduct formal training for that.

Other Salient Features of WMO Development Process

- (i) Facilitating (adopting a "handholding" approach) WMOs to manage water and O&M of infrastructure, agriculture, fishery, livestock and other livelihood activities (mainly through organized collective action in planning and providing services to beneficiaries) is defined as WMO development process
- (ii) For WMO strengthening towards the overall goal of increasing farm income, CSAWMPWMO Development Process focuses on experiential capacity building (learn-by-doing") supported by a "handholding" process primarily facilitated by BWDB Extension Overseers/Facilitators and technical assistance from a multidisciplinary team of professionals (Senior Facilitator). This process includes WMG formation and federation at WMA level, form Joint Management Committees (JMCs) and capacity building / strengthening of all these organizations partnership development between WMOs and BWDB and other Government agencies and between WMOs and the Private sector).

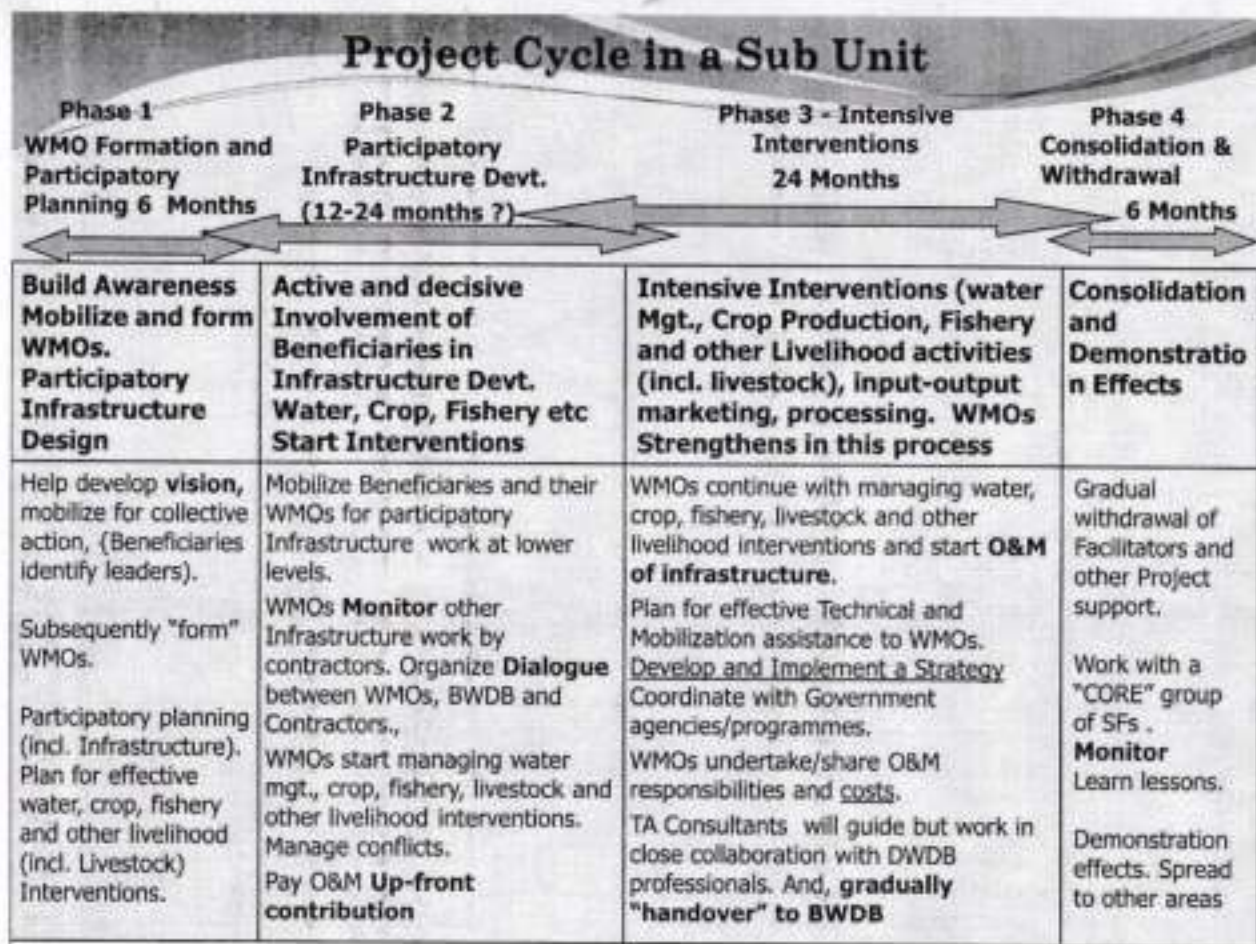
¹ For example, efficiency of Facilitators, extension service by Department of Agriculture or technical inputs by BWDB would affect the efficiency of WMOs. Similarly, O&M at higher level or bulk supply of an input or other service by WMA would affect the efficiency and scale of operation of WMG

- (iii) Project will employ Senior Facilitators/Facilitators Team would include professionals representing O&M, agriculture, fishery, livestock and other livelihood activities. The Team would be coordinated by an institutional development specialist. All members of the Team should possess a proven record of experience in working with communities and guiding Facilitators. PMO undertakes administrative control of staff and support services. DSC will work in collaboration with BWDB technical staff in providing technical assistance. BWDB staffs will "gradually take-over". Hopefully, full take-over by PMO staff would take place towards the end of the third year.
- (iv) The "hand-holding" approach uses trained Facilitators guided by DSC's WMO experts and with technical assistance by other DSC, PMO professional staff and multidisciplinary teams of Senior Facilitators (on-site). Facilitators will motivate, mobilize and assist beneficiaries and their WMOs throughout the subproject implementation process. As the process follows the experiential capacity building² or "learning-by-doing" method, it is believed that WMOs would develop the skills required to maintain the momentum created even after the withdrawal of Facilitators and other CSAWMP assistance.
- (v) WMO Development Process will be monitored and evaluated. Self-M&E by WMOs will be internalized and CSAWMP support to WMO will be based on the performance of the WMO (Milestones/triggers and performance indicators). Performance of Senior Facilitators (and all staffs involved, if agreed) will also be evaluated using specific indicators related to WMO strengthening, especially WMO-managed O&M and other services (related to agriculture, fishery, livestock, livelihood etc).
- (vi) To the extent possible, all the interventions would focus on collective action. This means all the members of the group / WMO would benefit from any intervention. For example, target indicators would be "Total and Average" fish production, crop production / cropping intensity, increase in the assets of WMO, value of collective action organized by WMO etc. Project inputs and support directed to selected individuals will be avoided.
- (vii) As WMO Formation and Strengthening is NOT separated from agriculture, fishery, livestock and other livelihood interventions and because water management and O&M of water infrastructure is the key to the success of almost all these interventions, it is expected that, **when they realize that such an integrated approach increases their incomes**, beneficiaries would undertake O&M responsibility including contribution in cash and kind. The real challenge is to motivate and organize quick-yielding activities and **make the contribution "up-front"**.

IMPLEMENTATION PROCESS

Figure-1: Four-Phase WMO Development Process and Sub Project Cycle

² Senior Facilitators/BWDB extension overseers are the main "capacity builders". They provide long hours of continuous "training" for three years. As adults "learn more by doing" and because these Facilitators are more acceptable and closer to beneficiaries (and also because the "training" is demand-driven" and on-the-job), formal training would be very much limited. Topics such as accounting / Finance Mgt, WMO-BWDB/Private Sector Contracts, Accounting for specific sub committees of WMOs, special technical training related to specific livelihood activity for a special group etc may include in formal training.



Note: Phases overlap with each other. Therefore, total would be about 4.0 years after mobilizing Facilitators.

Table-1 below shows the Phase-1 activity schedule focusing on SIP preparation.

Abbreviation:

DSC : Design and Supervision Consultant

SIP : Sub-project Implementation Plan

Table -1: WMO DEVELOPMENT PROCESS: SAMPLE ACTIVITY AND TIME SCHEDULE FOR PHASE-1

Step No.	Major Task	Sub Activities	Responsibility and Capacity Building, if Required	Average Time Required (Weeks)
Preparatory Activity-1	a). Prepare Maps of hydrological Units	a) PMO provide Maps to DSC (as agreed)	a) PMO is responsible for providing maps	One week?
	b). Within each SIP area (that is WMA), prepare hydrological unit maps and clearly mark WMG Units (hydrological units and not village-based)	b) DSC, in collaboration with PMO professionals demarcate hydrological boundaries of WMA areas (already done in some areas?) c) DSC in collaboration with PMO staff, identify "mini" hydrological units within WMA areas (for WMGs) d) Field verification by DSC in collaboration with PMO staff (Participatory Walk-throughs may also be used. Existing Extension Overseers/ Sr. Facilitators will also be involved). e) (Get an "idea" about direct beneficiaries as well)	b) DSC and relevant PMO professional staff "take-over" from that point c) Relevant engineers (DSC and PMO) conduct orientation "training" to others. TL takes the lead (sorry I couldn't consult TL)	(1) Two weeks (2)
	c). Predict the water level (spatial distribution within WMA areas, to the extent possible) after infrastructure development	f) DSC, in collaboration with PMO staff, simulate the "expected behaviour" of water level after infrastructure development. g) DSC, in collaboration with PMO staff, "prepare for presenting this to beneficiaries during the Participatory Planning process	d) Existing Ext. Overseer/Sr. Facilitators (NGO and PMU) may be sent to these SIP areas few weeks before the Walk-throughs and they would organize Walk-throughs. DSC and PMO staff walk-through with beneficiaries e) DSC take responsibility	One week (1) Three weeks (3)

Step No.	Major Task	Sub Activities	Responsibility and Capacity Building, if Required	Average Time Required (Weeks)
	Assign SIP areas to Ext. Overseers/ Sr. Facilitators Identification of "potential collective action", especially for suggesting to beneficiaries during the Planning phase (could start implementation soon)	studies, if any, etc) - DSC examine the "typical/common" interventions proposed for similar SIP areas and identify interventions/activities that could benefit from collective action - DSC examine the potential for "new" / innovative activities/interventions based on collective action - As much as possible, DSC and PMO staff should identify action plans for WMO-managed collective action	responsibility - PMO provides maps and data/information and collaborate - DSC get PMO staff involved to build their capacity? (this is usual practice, but I am not aware of the knowledge gap)	One week (1) (Simultaneousl y with above activities) So, no need to allocate additional time

Step No.	Major Task	Sub Activities	Responsibility and Capacity Building, if Required	Average Time Required (Weeks)
Step-1	<u>Awareness Building</u> Information, Education and Communication (IEC) Campaign, if possible. Otherwise, this will be done mainly by Ext. Overseers/ Sr. Facilitators	Topics: a) CSAWMP, its scope and components, expected outcomes and impact, its important characteristics: especially Integrated and Participatory Management b) WMO development: who should be leaders, how collective action could change incomes, need for sub committees, their composition, gender equity, special programmes for weaker sections of the society, WMO and WMA, JMC c) Sub Project Cycle, Interventions-broad areas: Infrastructure, Participatory water management and O&M, agriculture, fishery, livestock, other livelihood; examples of collective action in each of these broad interventions d) Planning process (SIP preparation methodology) e) Outline of "expected implementation cycle", roles and responsibilities of WMOs and WMOs (and beneficiaries) f) Participatory M&E.	a) It is ideal if IEC Campaign is done. Then, begin with IEC materials and methods including Mass media b) Facilitator: Informal discussions at household, small group and hydrological unit level (it is crucial to identify hydrological units). c) Followed by formal meetings at WMO and WMA level. DSC Training Specialist (in collaboration with PMO counterpart) would assist in providing the Ext. Overseer and Senior Facilitators with material to strengthen this process; e.g. handouts, posters (in addition, Training Specialist can provide inputs to Ext. Overseer and Senior Facilitators capacity in conducting meetings, presenting themselves and in Participatory Management and planning process). DSC WMO Specialist will be the overall Guide.	IEC Campaign: begin at least one month prior to fielding Facilitator. After that, continue in a reduced scale. Minimum four weeks after fielding Facilitator (4)
Step-2	Ext. Overseers/ Sr. Facilitators help beneficiaries identify potential members for the Planning		Ext. Overseers/ Sr. Facilitators are guided by DSC	Three weeks (3)

Step No.	Major Task	Sub Activities	Responsibility and Capacity Building, if Required	Average Time Required (Weeks)
Step-3	Committee			
	Form Planning Committee Assessing Present status and Feasibility Check (jointly with beneficiaries / Planning Committee)	Ext. Overseers/ Sr. Facilitators under the guidance of DSC and PMO staff, will mobilize and assist Planning Committee and beneficiaries to assess the present status of: - Beneficiary involvement in O&M and relationship with BWDB, sources of funding/status of water fee collection, willingness to change etc, - Resource use pattern (including land and water), especially the status of Agriculture and Fishery, associated water management and O&M, other livelihood (detailed formats will be provided) - Environment management, - Gender equity, and - Potential in the WMO area.	Formats, facilitating materials (e.g. for quick participatory assessments) Each of the Senior Facilitators teams will be provide with all the relevant maps of their respective areas, feasibility studies, handouts, brochures etc. DSC, PMO staff take responsibility. All work as a "Team" but each SJP may coordinate by a specific person.	One-day event Six weeks (6)

Step No.	Major Task	Sub Activities	Responsibility and Capacity Building, if Required	Average Time Required (Weeks)
Step-4	WMO Develop the WMO Vision {It is assumed that WMOs are "formed" at this stage} This will be elaborated later	a) Ext. Overseers/ Sr. Facilitators, with the technical assistance and guidance of DSC and PMO staff, motivate and educate WMOs and beneficiaries to think "how the WMO and its members would be in five years?" Specific indicators would be used. b) What should be the "path" towards that goal? c) How could WMO utilize collective action (Social Capital) in realizing the vision and goal? How WMOs were developed in other areas/countries? etc.	DSC, PMO staff, Ext. Overseer and Senior Facilitators will provide technical inputs in this process. They will: a) Provide each Ext. Overseer/Senior Facilitators-team with success cases local and abroad (not just stories, but recorded evidence and detailed process followed) b) Encourage live debates and brainstorming, Facilitate interactions Training Specialist will support this process as suggested earlier in step-1	Three weeks (Overlaps with above) (3)
Step-5	Identify potential interventions focusing on WMO-managed collective action	Consultants and the concerned PMO staffs together with the Planning Committees reach a consensus on a "package of interventions"; infrastructure, post construction O&M of these infrastructure, agriculture,		Four weeks (4) (Overlaps with above)
Step 6	Developing the Plan	a) DSC and PMO staff the "consultants' and PMO staffs' as well as Planning Committees' Plans" will be presented to		Six weeks



Step No.	Major Task	Sub Activities	Responsibility and Capacity Building, if Required	Average Time Required (Weeks)
		beneficiaries. b) Please refer "Participatory Planning Note" c) Present the Plan to the General Body. Plan should be approved by the General Body with at least with 75% majority.		{6}
Step-6	Open Bank Accounts MoA Between WMO and BWDB Capacity building on Plan implementation "Prepare" WMOs and beneficiaries for participatory implementation	a) Assist WMOs to prepare a draft MoA b) Facilitate the submission and discussion of MoA at the WMO General Body and BWDB c) MoA is Converted into a legal document and signed (expect a clear division of roles and responsibilities. Monitoring and Conflict management mechanisms etc are in place. Ready to implement the Plan) d) Continue with capacity building program.	a) Workshop with WMOs to prepare a draft MoA b) Workshop with WMOs and BWDB to discuss/modify (if required), and c) Facilitation and assist documentation at WMO General Body d) Facilitate and assist in Converting MoA into a legal document (expect a clear division of roles and responsibilities. Monitoring and Conflict management mechanisms etc are in place. Ready to implement the Plan)	Three weeks {3}

Total 10-12 months

Implementation Schedule

Implementation Steps	Year 01				Year 02				Year 03				Year 04				Risks / Remarks	
	01 July-30 June				01 July-30 June				01 July-30 June				01 July-30 June					
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4		
SIP Preparation Phase (6-10 Months)																		If Ext. Overseers or Sr. Facilitators are not recruited on time, Project may reduced to "infrastructure project" as there is no time for WMO development. Then sustainability of infrastructure O&M is doubtful.
Help develop vision,																		
Mobilize for collective action, (Beneficiaries identify leaders).																		
Mobilizing for collective action would continue. Here we show only initial phase																		
Subsequently "form" WMOs.																		
Participatory planning (incl. Infrastructure).																		
Plan for effective water, crop, fishery and other livelihood (incl. Livestock) interventions.																		
WMO enter into an Agreement with BWDB																		
Participatory Infrastructure Development																		
Mobilize Beneficiaries and their WMOs for participatory Infrastructure work at lower levels.																		
WMOs Monitor other Infrastructure work by contractors. Organize Dialogue between WMOs, BWDB and Contractors.,																		
WMOs start organizing collective action in O&M & managing water, crop, fishery, livestock and other livelihood interventions.																		
Manage conflicts.																		
Pay O&M Up-front contribution																		
Intensive Intervention Phase																		It is assumed that Infrastructure construction would be completed by mid 2013 (Otherwise WMOs would not get adequate time to reach an acceptable degree of "maturity" before the end of the project)
WMOs expand collective action and intensify the management of water mgt., crop, fishery, livestock and other livelihood interventions. Manage conflicts.																		
Project provides effective technical and organization assistance to WMOs. Develop and implement a Strategy.																		
Coordinate with Government agencies/programmes.																		
agencies/programmes.																		
WMOs undertake/share O&M responsibilities and costs.																		
DSC take the overall responsibility for guiding; but work in close collaboration with DWDB professionals. And, gradually "handover" to BWDB																		
PMO/BWDB Gradually "take-over"																		
Consolidation and Withdrawal of Project Assistance																		
Gradual withdrawal of Facilitators and other Project support.																		
Work with a "Core" group of SFs. Monitor. Learn lessons. Demonstration and spread effects.																		

If Ext. Overseers or Sr. Facilitators are not recruited on time, Project may reduced to "infrastructure project" as there is no time for WMO development. Then sustainability of infrastructure O&M is doubtful.

It is assumed that infrastructure construction would be completed by mid 2013 (Otherwise WMOs would not get adequate time to reach an acceptable degree of "maturity" before the end of the project)

"Thinning-out of Facilitators" would begin towards the end of phase-3. For example, by the end of this phase, only the Senior Facilitators would be left. They will visit all the sites and assist, as required.

Appendix-1: Development Path of a Progressive WMO / Federated WMOs

When the WMO reaches an adequate level of "maturity" in terms of organizational strength and resources, it may expand beyond collective purchasing of (agricultural /fishery) inputs and similar activities. Depending on the maturity, WMOs or higher-level organizations may add more profitable business activities/enterprises such as output marketing and organizing production. They may commence organizing beneficiaries for market-oriented production, undertaking forward contracting for identified markets, etc. Such activities would require more advanced organizational skills. In other words, a "matured" WMO would undertake other support services including input-output marketing and post-harvest services as well as agri-business (Figure). This will enhance beneficiaries' capacity to maximize profits. The Senior Facilitators and the Specialists should aim at developing an "entrepreneurial culture" within the WMOs.

