

Terms of Reference (ToR)

Consultancy Services for Construction Supervision & Monitoring for Phase-01 in connection with

Jamuna River Sustainable Management Project-1: Riverbank Protection and Riverbank Training (Component-1)

1. Background

Jamuna River Sustainable Management Project-1 (JRSMP-1) is the first in a series of project (SOP), where the government of Bangladesh (GoB) will be working with the World Bank and other Development Partners for a sustainable and integrated solution for flood and river bank management of the Jamuna River. The Phase 1 of the SoP will have following major components i.e. (i) C1-Riverbank protection and river training at suitable pilot sites, (ii) C2-Navigation channel development, (iii) C3-Disaster risk financing, (iv) C4-Institution building and project management and (v) C5-contingent emergency response. Its implementation will be from 2024 to 2028. There are three implementing agencies, namely Bangladesh Water Development Board (BWDB) for C1, Bangladesh Inland Water Transport Authority (BIWTA) for C2, and Insurance Development and Regulatory Authority (IDRA) for C3. Component 1 of the project, which is the main focus of this terms of reference (ToR) will provide scope for sustainable structural and non-structural mitigation strategies for the protection of vulnerable riverbanks at selected pilot site(s)-that can be scaled-up under subsequent phases of the SoP. The major objectives of the Component 1 of this project are:

- Establishing integrated and sustainable structural and non-structural risk mitigation system to protect the riverbank from erosion at selected sites.
- Enhancing resilience to flood and riverbank erosion risk through a combination of infrastructure development, institutional strengthening, capacity building and expanding knowledge base with minimal impact on environment.
- Improving the livelihood of people through avoidance of land and property loss, increasing agricultural and fisheries production, increasing economic activities, providing security for population and livestock and through many other direct and indirect benefits.
- Providing sediment management and scope for improving navigability in the vicinity of the pilot sites.
- Gaining insights on how the innovative river-protection and river-training structures of the pilot implementations can perform for the Jamuna River and if their larger scale implementation is worthwhile which can facilitate as preliminary support for preparing the Feasibility Studies for Phase-2 River course stabilization, river-training, bank erosion protection and contribute to navigation improvement.

2. Objective of Consulting Services:

The main objectives of the consulting services under this ToR are Construction Supervision and Project Management Capacity Support for Component-1. The consultants should have some design capacity as well. The main tasks are as follows:

- Task A.** Review and update as well as develop (as needed), the modelling for site selection, designs of engineering/physical interventions, and related environmental and social action plan; Conduct continuous monitoring survey and investigations for review of working designs of engineering/physical intervention, land acquisition, rehabilitation and resettlement plan and the schedule of the action plan for the same;
- Task B.** Supervise construction of all works as per technical specifications and standards under the project, and do the contract management as per provision of the work contracts. All contracts, either NCB or ICB would be procured and implemented according to the World Bank Procurement Regulations and using World Bank standard bidding documents as well as PPA-2006 and PPR-2008; and

Task C Provide overall project management support and capacity building to the BWDB and Project Management Units (PIUs). The Consultant shall develop a web-based geo-referenced database in which all technical, physical, environmental and social data are stored for easy and consistent reference throughout the duration of the project and can be easily integrated to the existing system of BWDB;

Procurement method of the Consulting Service (International) will be Quality and Cost Based Selection (QCBS) and the Contract will be Time Based.

3. Scope of Work

Task A: Review and Update Designs already prepared in DPP, Detailed Working Design, and Environment and Social Studies

Various studies and reports have already been completed to river training and management in Brahmaputra-Jamuna Project. Before work commencement the Consultant should undertake a comprehensive review of all earlier studies and reports covering the area, such as Brahmaputra Right Embankment (BRE), Flood and Riverbank Erosion Risk Management Investment Program (FRERMIP) Phase-1, Sirajganj Hard Point, and during preparation of JRSMP-1 etc.

The Consultants will review and update the designs (as required) already prepared in the DPP for JRSMP-1 C-1. The Consultants will use the standard as described in detailed task and the best practices in the field to update or adjust designs, including during construction, as needed. They will also update and carry out any additional engineering studies, investigations and social and environmental studies needed. The consultants will also review related environmental management plans and social action plans (EMPs, and SAPs) already prepared. This would be the first priority task for the Consultants after mobilization. PIU offices will provide all existing documents and studies related to this task in paper and in electronic form.

This task will cover the review of the detailed working designs along with confirmation of final site selection of the river training pilot structures due to morphological change situation (there is a model developed during project preparation). The revised (if required) design report would be prepared for each contract package consisting of engineering, environment and social with conducted Environment and Social Impact Assessment (ESIA). This task will provide focus on existing modeling aspects of river dynamics, geomorphology, and implication of climate change, among others for continuous monitoring and updating detail working design of the river training pilot structures that confirms final sites and other parameters.

Task A1: Modeling for reviewing and updating the Detailed Design

Hydrological, Hydraulic and Morphological study and Mathematical Modeling: In order to optimize the best sites of river training works in DPP, a sustainable way with future minimum O&M requirements, the Consultants shall carry out necessary hydrologic, hydraulic, river and river dynamics, sediment transport, and implication of climate change using developed model among others for design criteria that confirms final sites and other parameters according to the best international practices. In doing that, the Consultants would consider the changes that have been taken place in the river cross sections, updated discharge time series, and other geographical and meteorological conditions. The Consultant will use satellite imagery and floods for river behavior analysis.

Against this background, the Consultant will undertake a regular updating of the mathematical models developed against prevailing and changing conditions during construction, as such the Consultants will carry out the following tasks:

- **Update and develop (as needed) the hydrological, hydrodynamic, morphological, climatological, and mathematical modeling framework** taking into account the following but not limited to:
 - i. Reasonable projections of inflow, velocity and sediment transport due to future climate change in the Jamuna/Brahmaputra River environment.
 - ii. Future river behavior showing bank extent and magnitude erosion as well sediment deposition.

- iii. Projection of the future river stage and flood extent in reach scale covering the proposed physical interventions.
- iv. Assess appropriate protection levels and flooding scenarios for different return periods.
- **Optimize river training design criteria to provide best cost-effectiveness for protection** taking into consideration vulnerabilities of the socio-economic conditions, the consultants will suggest the development of cost-effective methods and modalities of river training works for bank erosion control combining **by the pilot top-blocked permeable groins** and nature-based method. In addition, revetment and riverbank protection works might be essential in stretches that are exposed to high erosion. The modeling should identify these stretches and provide design parameters to inform the detailed design works.
- **Model calibration and data collection.** In order to complete the above and validate and calibrate the modeling framework the Consultant shall conduct topographical, bathymetric, hydrometric survey and site investigation using total station, DGPS, high frequency eco-sounder, ADCP and satellite imagery analysis, GIS and other computerized systems to gather data necessary for morphological and river engineering detail design as mentioned above and for improving and calibrating available hydrodynamic, and morphological model;

Task A2: Reviewing and updating of Detailed Design and Preparation of Bidding Documents

This task will cover the revision of detailed working design and preparation bidding documents. It is important that the design follows the most up to date standards and codes and be fully based on ground information and modeling results. This will include the following but not limited to:

- Revise detailed design of top-blocked permeable groins, bank protection stretches and other civil works as mentioned in the DPP/RDPP;
- Prepare estimates of quantities of construction, materials, equipment, and prepare cost estimates, and breakdown by major works items;
- Prepare bill of quantities (BoQ) and proper engineering drawings that need to be carried out in each package; and
- Preparation of corresponding bidding documents of the civil works according to World Bank / BPPA guidelines;
- Ensure the Bidding Documents will incorporate the ESMP in accordance to the guideline presented in the EMF.
- Determine appropriate alignment of top-blocked permeable groins and other river protection works under Phase -1 (according to DPP/RDPP);
- Identify area suitable for afforestation for nature based biological protection;
- Identification of proposed suitable location for (i) stock yards of dumping materials (CC blocks and Sand filled Geo-textile bags); (ii) construction yards and (iii) disposal sites for excavated and dredged materials.

Task A3: Preparation of Land Acquisition Plans (LAPs) and Resettlement Action Plans (RAPs)

The objective of this task is to prepare and implement LAP and RAP for each site of the river training works. The RAP shall be prepared in accordance with the GoB policies, and the project's Resettlement Policy Framework (RPF), with reference to the Environmental and Social Standard (ESS) 5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement of the World Bank's Environmental and Social Framework (ESF).

Preparation of Land Acquisition (LA) Plan and LA Proposal

Major activities to be carried out for preparation of land acquisition plans and proposals will include, but not limited to the following:

- Carry out land survey and identify the footprint of the civil work site in terms of land ownership (private, Khash etc.) and land use and location of environmental importance;

- Collect the Mouza/cadastral (CS, SA, RS/BRS) map. Based on these findings, prepare the land acquisition proposal (LAP) for acquisition of land for proposed interventions/Infrastructures;
- Identify the mauzas within the boundaries of the proposed interventions as per design layout by location (Union, Upazila and District);
- Collect the names of current owners as per latest ownership records (RS/BRS Khatian) with subsequent changes through title transfer resulting from direct sale, exchange, inheritance, donation, and acquisition under the power of eminent domain of the country;
- Digitize all cadastral maps with geo-references of plot boundaries, ownership and land use (road/embankment, agricultural, residential, fishery, forestry, vacant, etc.).
- Prepare LA plans and LA proposals for each site for acquisition of lands for civil works and link the LA plans with the ALAMS.

Preparation of Resettlement Action Plan (RAP)

Major activities to be carried out for preparation of RAPs will include, but not limited to the following:

- Review project interventions and design including requirement of lands in each civil work's site, with reference to active laws on land acquisition in Bangladesh, project's Resettlement Policy Framework (RPF) and as well as the World Bank's Environmental and Social Framework (ESF);
- Following the RPF, carry out detailed measurement of losses – affected land, structure, trees, crops, and employment, income, business and industry - and identify Project Affected Persons (PAP) including title holders, non-titled owners and users of affected property (squatters, encroachers and tenants), and affected income earners as follows:
 - landowners (residential and non-residential)
 - owners of physical assets (structures, crops, productive trees etc.)
 - owners of business and industry
 - household/person with potential impact of loss on income and livelihoods associated with businesses, industry and rental or productive assets
 - community or group affected with their common property structures (socio-cultural, religious, educational, and the like not defined as physical cultural resources)
 - any other persons or groups

The inventory of losses (IOL) data will be supplemented with onsite still and video imaging for cut-off date of recognizing losses for compensation and assistance.

- Design and carry out 100% census of PAPs affected with their housing, income and livelihood resources.
- Review relevant national process and the RPF recommendations on valuation of assets and design and carry out market price survey for determining current market prices (CMP) of land, structures, trees and crops, recommend replacement value (RV) and determine wage rate and loss of income by affected business and industries;
- Design and implement a program of information disclosure along with consultation and participation of beneficiaries and affected persons in identification, design and implementation of project interventions and the resettlement policy of each site. The stakeholder engagement and consultation will be a continued process throughout the implementation of the RAP;
- Prepare a report to describe legal framework for RAP, relevant local laws, customs that apply to land acquisition; describe entitlement policies for each category of impact and specify that resettlement of PAPs will be based on specific provisions of agreed RAP; describe methods of valuation used for affected property; prepare compensation and entitlement matrix; and describe grievance redress procedures for registering complaints and management of complaints;

- Prepare institutional arrangement and capacity development of the social unit under the PIU for implementation of RAP including linkages with the PIU & SMO's (BWDB field offices), local administration, NGOs and other stakeholders;
- Prepare cost estimates of RAP implementation separately identifying the administrative costs, consulting services, equipment, and compensation under each impact categories, such as land, houses, trees, other property, cost of basic facilities for relocation sites, etc.;
- Prepare implementation schedule including timelines for land acquisition milestones, relocation and livelihood restoration of PAPs and handing over lands for civil works construction, and monitoring and supervision mechanism with pre-set indicators;
- Propose a detailed Grievance Redressal Mechanism (GRM) related to land acquisition and resettlement that can be tailored to respond to grievances on sexual abuse and harassment; labor and stakeholder engagement.

Task B. Construction Supervision, Contract Managements, and Administration Works

The Consultant will be responsible for inspection and supervision of the construction works, installation of equipment, and testing of construction material in assistance with the SMO's. The Consultant will ensure that the works implemented and goods supplied are in accordance with the designs, specifications and terms and conditions of the relevant contracts and standards. The Consultants will assist Project Director to ensure that procurement of goods, services, civil works contracts, etc. are in accordance with the World Bank Policies and guidelines, and the contract are signed and managed properly including any changes or variation orders necessary during implementation. This will also include project management support, assistance to BWDB in institutional setup for project implementation, technical assistance, training, setting up of project office if needed, support in project implementation and procurement planning, carrying out procurement, financial management, contract management, etc.

In the context of contract management, the Consultant will carry out, but not necessarily be limited to, the following activities:

- Act as "Engineer" in FIDIC Contract template and as "Project Manager" while using OTM NCB. The consultant shall issue any instructions/variation orders involving financial implication with the approval of Employer and indicate the same while advising the contractor. This provision overrides contract provisions in the works contracts.
- Assist Project Director, and SMOs for contract administration and management;
- Provide day-to-day construction supervision and inspection of the civil works at site, including carrying out pre-construction and post-construction surveys, by the provision of suitably qualified and experienced supervision staff;
- Keep the Employer informed of any delay or potential delays in the work schedule of contracts, taking all necessary actions to prevent or rectify potential delays;
- Regularly monitor and inspect the Contractor's quality control and assurance program to ensure that quality of finished works meets the contract standards and specifications. This includes regular checking of the materials testing program;
- Prepare any required variation orders requested by the Employer and review any variation order proposed by the Contractor and advise the Employer in accordance with the contract;
- Review all claims submitted by the Contractor and provide advice to the Employer on the validity of the claim, the effect of such claim on the construction schedule and the cost of the project;
- Advise the Employer in writing of issues related to delays and cost control. Establish factual time extension evaluation in case of extension requests and variation of works.
- Review and recommend/approve the Contractor's implementation schedule and proposed personnel nominated in the contract;
- Inspect and recommend/approve all material sources identified by the Contractors; Testing of materials using both on-site and off-site depending on the needs, if necessary, in-factory testing during manufacturing and inspection of good and materials;

- Determine and certify/recommend all construction quantities in association with the SMO's;
- Maintain records of all testing work, including cross-referencing of items of work to which each test refers and location from which any samples were obtained for testing;
- Measure the completed works and keep detailed records jointly with the SMO's;
- Maintain records of all plant, labor and materials used in the construction of the works;
- Review and updated operation, maintenance and management manuals for the facilities constructed under the project; Assurance for proper demobilization and restoration of the construction sites after completion, O&M during warranty period by the Contractors;
- Advise and assist the Employer with respect to arbitration or litigation relating to the works, whenever required. The Consultant will carry out all obligations provided by the Project Director in the Civil Works contracts. In the event of contractual dispute which may result in legal action, adjudication or arbitration between the Contractor and the Employer, and on the instruction, will collect prepare factual documentation which describes the circumstances of the dispute, and if required the Consultants would attend hearings.
- Performs any job-related duties as assigned by PD.

Task B1. Monitoring the Implementation of the Environmental and Social Management Plan (ESMP)

The Contractor will be responsible for implementing the ESMP. The Consultants will be responsible for overseeing the proper implementation of the ESMP on the ground.

- Review and recommend to approve the Contractor's Environmental and Social Action Plan (ESAP), as per the ESMP;
- Liaison with the Contractors for the Implementation of the ESMP;
- Advise the Contractor and BWDB on ways to implement the ESMP;
- Interact with the NGOs or Community based organizations (WMG, RMG, FMG, etc.) to be involved in the project for ESMP implementation;
- Dialogue with the Project Affected Persons (PAPs) before submitting the monthly progress report on Environmental & Social status and ensure that the environmental as well as social concerns and suggestions are incorporated and implemented in the project;
- Supervise construction work and monitor the implementation of mitigation measures under the ESMP and ESAP;
- Supervise and monitor project activities in the field level and provide technical advice to ensure compliance of the mitigation measures by the Contractors;
- Update of ESMP and ESIA after receiving information from the contractors and inform BWDB;
- Conduct regular field visit during the project preparation and implementation to ensure environmental safeguards are being properly conducted;
- Conduct at least one consultation workshop at each site in every year to discuss the environmental concern.
- Performs any job-related duties as assigned by PD.

Task B2. Implementation of LAPs and RAPs

Major activities to be carried out for implementation of LAPs and RAPs will include, but not limited to, the following:

- Review the SIA, land acquisition status and civil works schedule and develop all-inclusive RAP implementation plan in agreement with the BWDB, the civil works contractors and the PAPs;
- Disclose project resettlement policy, entitlement packages, grievance redress mechanism and the provision for participation in the process of relocation, resettlement and livelihood restoration of the PAPs;
- Liaise with the Deputy Commissioners' offices in the process of land acquisition including joint verification, notifications and payment of Cash Compensation under Law (CCL) and collect information on payment of CCL;

- Develop databank of inventory of losses (IOL) including data on land acquisition, joint verification, loss of non-land assets and income as per IOL, compensation and entitlement rates (approved and up-to-date), payment of compensation for lost assets and assistance for relocation and livelihood restoration;
- Design and develop management information system - MIS for generation of IOL databank, reconciliation of databases from various sources (land acquisition, joint verification, census and IOL, replacement rates), determination of individual losses, calculation of compensation and entitlements, processing payment, determining item-wise progress and staff performance;
- Identify and issue ID cards with photographs of the Eligible affected Persons (EPs). Digital photographs will be used and uploaded in the MIS and IOL databank for preparation and issuance of photo ID cards;
- Process and deliver entitlements to the EPs using the system with proper documentation and instrumentations;
- Facilitate complaints resolution related to compensation, resettlement and livelihood restoration under the provisions of the RAPs;
- Develop and implement relocation strategy and plan for relocation of PAPs upon payment of compensation and cash assistance as per RAPs.
- Set indicators and monitor and evaluate RAP implementation activities and report through monthly, mid-term and completion reports.
- Performs any job-related duties as assigned by PD.

Task C: Project Management Support and Capacity Building

The Consultants will provide support to BWDB in overall project management in activities such as preparation of project implementation plans, annual expenditure planning budgeting and financing forecast and plans, monthly reports and annual reports or work programs as required by the Government of Bangladesh and financiers of the project. They will also help in development of the procurement plans, contract management, and financial management. The plans would be updated on a regular basis as required by the BWDB.

The Consultants will support BWDB and PD in obtaining site permits, construction permits, or any other permits or paper work which are necessary for the project and will act on behalf of the Owner as and when designated. The Consultants will support PIU in procurements of works, goods and services under the project, preparation of bidding documents for such procurement, contract management and day to day management issues.

The consultants will assist PIU for writing Terms of Reference for any additional work that are to be carried out under the project for which additional services would be required and identified during project implementation. The consultants will also provide technical assistance and necessary trainings to the project staff and for that purpose prepare an overall training program for on-the-job training and possibly study tours based on the assessment of the training and technical assistance needs for the BWDB for implementation of the project and other programs. The training programs are likely to cover: (a) knowledge share of hydrologic/hydraulic model setup & validation and hydrological observations related on-the-job trainings; (b) project management, project planning, expenditures planning, financial management and budgeting; (c) preparation of detailed designs according to international standards, ESIA's, LAPs, RAPs; and (d) procurement and contract management.

Project database development and maintenance: The Consultant shall prepare a web-based geo-referenced database in which all technical, physical, environmental and social data are stored for easy and consistent reference throughout the duration of the project and can be easily integrated to the existing system of the BWDB;

Workshops/ Seminars and Trainings. As a part of consultation in course of planning and design phase, series of meetings/discussion sessions/workshop will have to be organized from community through national level with various interest/beneficiary groups. In addition, it will be needed to involve the implementation agency and partners for effective transfer of technology. The consultant will prepare an overall plan with their approach to carry out this task of consultation and training for review and approval by BWDB. Thereafter, these will be organized in consultation, support and guidance from the Project/BWDB.

4. Reporting:

The Construction Supervision and Project Management Consultants will prepare and submit the following reports:

- i. Within 1 (one) months of commencement, the consultants will prepare an **Inception Report** which will include a review of the detail design and work plan covering all aspects of the assignment. The work plan among others will include implementation of different component under this DPP, Construction supervision and monitoring plan, Procurement Plan of contract packages and Consultant's proposed Quality Assurance Plan.
- ii. Prepare **monthly progress report** which will summarize the ongoing tasks, with detailed physical and financial progress of the works, implementation status of ESMP/ESAP/RAP/LAP, procurement status including contracts variations and change of orders over the previous month. The report will list the implementation issues and recommendation to overcome those and present the Consultant's work plan for the next three months.
- iii. Provide **Annual Progress Report**.
- iv. **Midterm Report**, before the Mid-term Review, summarizing the accomplishments of the consultants and the resources utilized up to the Mid-term.
- v. Prepare a **draft completion report** at the end of the assignment for Component works in accordance with the Government/IMED's format;
- vi. **Finalize the completion report** incorporating the comments received from other agencies and also summarize the experience and lessons learnt in course of implementation of the project component including recommendations for future projects.

The Timelines of the deliverable is given below:

Deliverables	Planned Submission schedule
1. Inception Report	1 st Month after contract signing
2. Monthly Progress Report including detailed design and implementation status of construction, Test Results, RAP, monitoring of ESMP etc.	Monthly after submission of the Inception Report
3. Accomplishment report of Task A	4 th Months after contract signing
4. Annual Progress Report	12 Months after contract signing
5. Mid Term Report	prior to the Mid-term Review (date to be determined)
6. Draft Final Report , significant completion of every task	Two months before the end of the assignment
7. Completion Report , compliance of all activities	At end of the assignment

5. Implementation Arrangements

BWDB will be responsible for the implementation of the Project as client. A Project implementation unit (PIU) has been constituted to monitor the development and management of the project which is led by a Project Director (PD). The Consultants shall work closely with the PD of the Project Implementation Unit (PIU) set up for the JRSMP-1 (C1) having a central **Project Office** in Dhaka. The Consultant will also be needed to establish their office in Dhaka as well as in the field at convenient locations for their regular reporting activities. During the inception stage, the Consultants shall prepare a detailed schedule and task-flow diagram, which illustrates the coordination of various tasks in the assignment. This may lead to the completion of works and mechanism of Coordination with the client and other related entities. It will have to be updated, as needed, over the Project duration.

In the context of project management, PIU will be the 'Procuring Entity' and the Construction Supervision & Monitoring for Phase-01 consultant will act as the 'Engineer'. The Engineer will review and update the drawings

during construction stage, make modifications (if required), prepare the detailed design, supervise and monitor the construction works, and manage the Contract on behalf of the Employer. In doing such work by the Engineer, if there is a necessity of financial implication (like amendment of contract, variation of contract amount, except the works carried out under Provisional Sum), the Engineer will take prior consent from the Employer. The Team Leader will role as the contact person on behalf of consultants during project implementation. At each site, the contractor will be supervised by a Resident Construction supervision Engineer with a team of specialists and inspectors, appointed by the Construction Consultants. The PD will coordinate their work with concerned SMOs, Ministry of Water Resources, local administrations and relevant ministries and agencies.

In addition, the SMOs (existing Water Development (WD) Divisions of BWDB) will also carry out top level supervision and monitoring of the construction works as being part of the PIU from O&M perspective when the works will be undergone for O&M phase.

The Consultants shall be responsible for all aspects of performance of services as set forth in the designated sections of this ToR. BWDB (PIU and SMOs) will be responsible for providing the existing data and information including all reports prepared so far for the project as well as any other documents; if available.

Responsibilities of BWDB: The Consultant shall work under the direct supervision of the PIU. PIU office of BWDB shall assist the Consultancy Team as required, particularly with regard to the hydrological, morphological, environmental, social and institutional aspect of the services. In case of any unforeseen events, be it in terms of physical or social obstacles at field levels, the SMOs (BWDB concerned field offices) will take initiatives to resolve them and ensure good working environment.

Technical and project management issues shall be discussed in tri-partite meeting among BWDB, PD-PIU along with SMOs and the Consultants. Any unresolved issue, technical or otherwise, would be taken up with Director General, BWDB, Dhaka through the Project Director.

Duration of the service. Duration of the service shall be **27 Months**. Last but not least, the Consultants will provide necessary supports to any technical-related issues that may arise after the implementation of the project throughout the first year of closure.

Staffing Requirements. A team of international and national consultants will be appointed for the implementation of the project. It is expected that the Consultants will propose their required person-months both international and national, to carry out the tasks as per ToR. However, international working experience along with the implementation of World Bank Financed projects are necessary to carry out the assignment. The Consultants are free to propose a staffing plan and skill mix necessary to meet the objectives and scope of the services. JVCA will be an effective option in case of unavailability of required skills within any consulting firm. The Reimbursable expenses will include facilities and services required by them as well as office accommodation, transport, offices equipment, etc. for Dhaka office. The qualifications and job descriptions of required key and other main staffs are appended below. However, the Consultant may propose its own staffing inputs as appropriate, but not limited to carry out the assignment.

6. Key Professionals

International Key Experts

Position	Quantity	Person Months	Total Person Months
Team Leader	1	15	15

National Consultants for Construction Supervision

Position	Quantity	Person months	Total Person months
Co-Team Leader/Construction Engineer	1	24	24
Design Engineer	1	6	6
Geo-Technical Engineer	1	3	3
Resident Construction Supervision Engineer	2	24	48

Resident Quality Control Specialist	2	24	48
Environmental Health and Safety (EHS) Specialist	1	18	18
Land Acquisition & Resettlement specialist/ Sociologist	1	12	12

National Non-Key Experts

<u>Position</u>	<u>Quantity</u>	<u>Person months</u>	<u>Total Person months</u>
Mathematical modeling specialist	1	5	5
Mathematical Modeler	1	5	5
GIS and Remote Sensing Specialist	1	5	5
ICT Expert/Programmer	1	5	5
Senior Estimator cum AutoCAD Specialist	1	6	6
Senior Surveyor	2	7	14

7. Task and Qualification of Key professionals (International and National)

A. International Consultants:

<u>Discipline</u>	<u>Qualifications and Tasks</u>
Team Leader	The TL should have Masters' degree in Water Resources Engineering/River Engineering/Hydraulic Engineering/Water Science and Engineering. He/she should have 20 years professional experience in river and delta management including 10 years international experience. The TL should have 10 years' experience in the relevant field like construction supervision of river, flood and erosion management, including leading and managing at least one multidisciplinary consultancy team for river/delta project management, construction supervision and quality control, detailed design of river training works, modeling, hydrological and morphological survey, procurement, ESMP, RAP and LAP, people's participation, etc. He/she should have experience in disaster risk assessment and devising mitigation measures for risk reduction in the river system. Having international experience in Bangladesh or any similar landscape or delta countries with integrating nature-based features in river and delta management would be considered as an advantage. The TL must have proven knowledge on FIDIC standard contract management and recent guidelines and standards of World Bank Group (e.g. ESF). The TL having foreign nationality will be given preference. <u>Tasks:</u> His/her major tasks include but not limited to the following: - Prepare project work/implementation plans and schedules. - Management support to the PD, PIU to prepare of project implementation plans, annual expenditure planning budgeting plans, procurement plans, bidding documents, contract management, monthly reports and annual reports or work programs as required. - Guide and supervise the project activities like review of design and modeling, construction supervision, implementation of ESMP, RAP and LAP etc. - Preparation of Estimates of works, verification of variation of works, etc. - Assist PIU for writing terms of reference for any additional work that are to be carried out under the project for which additional services would be required and identified during project implementation. - Formulation of implementation and O&M manual. - Maintain liaison with PIU, BWDB, World Bank, and other related agencies.

B. National Consultants (Key-Experts):

Discipline	Qualifications and Tasks
Co Team Leader/Construction Engineer	She/he should have a Bachelor's Degree in civil/water resources engineering. Higher degree is preferable. He/ she should have 20 years of overall professional experiences in water resources management, including leading and managing a multidisciplinary team for water resources project management, construction quality control, river training design, ESMP, RAP and LAP, sediment management, people's participation etc. He/She should have 10yrs experience in risk assessment and devising mitigation measures for risk reduction in the river training works and river management. Tasks: His/her major task includes but not limited to the following: - Maintain liaison with PIU, BWDB, World Bank and other related agencies - Management support to the PD, PIU to annual expenditure planning, budgeting plans, procurement plans, bidding documents, contract management, monthly reports and annual reports or work programs as required - Coordinate all the component of works on construction supervision and review of detail engineering design of hydraulic structures and data collection. - Guide and supervise the other activities like implementation of ESMP, RAP and LAP, etc. - Preparation of Estimates of works, verification of variation of works, etc. - Review the available reports on river training works in Jamuna River and manuals for river training works - Supervision of construction different types of river training works (like groin, spur, revetment works, cross bar, etc.) and dredging, construction of bank/slope protection works and re excavation of drainage channels etc. - Conduct testing of materials in the laboratory and monitor testing of materials outside the laboratory and certify all these test reports to confirm the standard of materials. - Check the quality of materials to be used in the construction works, - The construction of river training works will follow the testing of concrete in the laboratory etc. - Assist in preparation of quantification of work done - Assist the team leader in guiding and supervising the project activities, - Formulation of implementation and O&M manual. - Preparation of different inception report, progress and other reports etc. - Preparation of Final Report as needed under the Contract. - Supervision of construction different types of river training works (like groin, spur, revetment works, cross bar, etc.) and dredging, construction of bank/slope protection works and re excavation of drainage channels etc. - Conduct testing of materials in the laboratory and monitor testing of materials outside the laboratory and certify all these test reports to confirm the standard of materials. - Preparation of quarterly progress report and half yearly progress report. - Preparation of time schedule for successful completion of construction works within the scheduled time. - Scrutinize the design drawing for appropriateness of the design before starting the construction works. - Check the quality of materials to be used in the construction works, - The construction of river training works will follow the testing of concrete in the laboratory etc. - Assist in preparation of different reports as required by the team leader and PD.
Design Engineer	She/he should have Bachelor's Degree in Civil / Water Resources Engineering. Higher degree will be an added advantage. He/she should have 15 years of professional experiences in water resources sector with at least 10 (ten) years experiences in design of river training and flood mitigation hydraulic structures. Previous experience in similar working environment will be given preference. Tasks: The Design Engineer shall be responsible for design of the alternative structures/measures suitable for the solutions of the riverbank erosion considering the flood risk management. His/her major responsibilities shall include but not limited to the following:

Discipline	Qualifications and Tasks
	- Design of the alternative structures recommended in DPP for the solutions of the riverbank erosion problems such as hydraulic structures/river training works, groin, spur, revetment works, cross bar, etc. and dredging/excavation, construction of bank/slope protection works, construction of embankments and re-excavation of drainage channels etc. - Establish the criteria for hydraulic design of the proposed protective works and other hydraulic structures using guidelines - Comparison of the alternatives and find out the suitable solution - Develop design specifications and drawings - Participation in meetings with BWDB as and when required - Assist in preparation of different reports as required by the Team Leader and PD
Geo-Technical Engineer	He/she should have Bachelor's Degree in civil engineering having 12 years of professional experience with 5 years' specific experience in soil-boring & other geotechnical aspects. Masters in geotechnical engineering will be given preference. • Tasks: His/her major task includes but not limited to the following: - Assess need based Geo-technical information - Data collection, Quality control, analysis and compilation - Soil-boring & other geotechnical aspects - Preparation of different reports as required for the proposed structures - Assist in preparation of different reports as required by the Team Leader and PD
Resident Construction Supervision Engineer	He/she should have Bachelor's Degree in Civil/ Water Resources Engineering having 12 years of professional experience in Civil Engineering with 8 (eight) years' specific experience in the relevant field like construction supervision of hydraulic structures/river training works/sediment managements. Higher degree will be an added advantage. Previous experience in similar working environment will be preferred. He/She should have proven knowledge in construction materials testing. Tasks His/her major tasks include but not limited to the following: - Supervision of construction of different types of river training works (like groin, spur, revetment works, cross bar, etc.) and dredging, construction of bank/slope protection works, construction of embankment and re-excavation of drainage channels etc. - Scrutinize the design drawing for appropriateness of the design before starting the construction works. - Preparation of time schedule for successful completion of construction works within the schedule time. - Conduct testing of materials in the laboratory and monitor testing of materials outside the laboratory and certify all these test reports to confirm the standard of materials to be used in the construction works. - The construction of river training works will follow the testing of concrete in the laboratory etc. - Assist in preparation of quantification of construction works done. - Preparation of monthly, quarterly and half yearly progress report. - Assist in preparation of different reports as required by the Team Leader and PD.
Resident Quality Control Specialist	He/she should have Bachelor's Degree in Civil/ Water Resources Engineering having 10 years of professional experience with 8 (eight) years' specific experience in the relevant field like construction supervision of hydraulic structures/river training works. Previous experience in similar working environment will be preferred. His/her major responsibilities shall include but not limited to the following: Tasks. - To maintain the quality of works for construction of different types of river training works (like groin, spur, revetment works, cross bar, etc.) and dredging, construction of bank/slope protection works, construction of embankments and re-excavation of drainage channels etc.

Discipline	Qualifications and Tasks
	- To conduct laboratory test of materials and match with the desired test results before starting of construction works. - All types of field test equipment shall be collected well ahead the commencement of construction works, - Provide due attention to remove unsuitable and unspecified materials. - Obtain test results of materials and test results of concrete by hand testing equipment at the time of starting of the works. - Formulate the format for test results for easy verification and necessary documentation. - Responsible for ensuring the quality of all types of construction works as per specification. - Preparation of monthly, quarterly and half yearly progress report. - Assist in preparation of different reports as required by the Team Leader and PD
Environmental Health and Safety (EHS) Specialist	He/she should have Masters' degree in Environmental Engineering/ Environmental Science/ Water Resources Engineering/Geography/Hydrology with special training in carrying out EIA and preparation of EMP. He/she should have at least overall 15 (Fifteen) years of overall working experience and 10 (Ten) years of specific experience in similar assignments. Knowledge on EIA for river training works, ecology and river morphology, flood management, and GIS will be an added advantage. Familiarity with World Bank safeguard policy and experience with EIA of water related World Bank funded project is preferable. Tasks: His/her major tasks include but not limited to the following: - Assess the baseline environmental condition - Assess the potential impacts of the project activity on surrounding environment - Review the ESMP for each package of works under the project - Implementation of ESMP for each package of works under the project - Provide guidance and oversight to ensure compliance - Implement and maintain the site security management system, as applicable - Defines and monitors actions to improve EHS performance - Monitor the effectiveness of the site related rules defined in the Site EHS plan and revise as necessary to keep up to date, in consultation with the TL, Co-TL and Project Director along with Site Manager - Ensure appropriate actions are taken in the event of non-compliance - Provide timely information to the site management in relation to any trends that become evident through analysis - Ensure an effective EHS management and audit program is maintained to monitor compliance with all relevant site EHS requirements - Ensure effective implementation of the site risk assessment process - Ensure that all EHS events are reported, recorded and analyzed - Ensure full implementation of a just and fair culture in terms of reward and discipline at site - Advise site management on potential legal exposure and EHS concerns - Implement and maintain effective emergency plans, security programs and site access control procedures - Preparation of monthly, quarterly and half yearly progress report - Assist in preparation of different reports as required by the Team Leader and PD
Land Acquisition & Resettlement Specialist/Sociologist	He/she should have Master's degree in Sociology/Geography/Earth/Social Science or any other relevant subjects from any recognized University in Bangladesh or abroad with at least 12 years of professional experience with 8 years of experience in the relevant field. Also, should have working experience in design of Resettlement Action Plan (RAP) for the project affected persons (PAPs), in identification of the PAPs and assessment of their loss of assets and incomes and design and conduct consultation and participation. Experience in the similar nature of works in the similar area will be given preference. Task: His/her major task includes but not limited to the following: - Identify the layout of the works in terms of land ownership (private, Khash etc) by land use. - Collect of Mouza/cadastral maps and digitize them with the assistance from the GIS Expert.

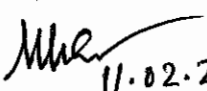
Discipline	Qualifications and Tasks
	- Prepare the Land Acquisition Plans (LAP) and proposals. - Identify area suitable for afforestation/social forestation. - Identification of proposed suitable location for construction works. - Review the ESMP and the applicable legal and policy guidelines related to land acquisition and population displacement due to the project interventions. - Review project design, boundaries of project interventions and implementation schedule. - Design and carry out stakeholders' consultation including focused group discussions for collecting local information on social condition, cultural values, and inputs for RAPs. - Design survey for identification of lands for acquisition, inventory of losses and Project Affected Persons, and for valuation of affected assets. - Review SIA and prepare RAP for each site. - Review RAPs and design RAP implementation supervision plan - Assist in preparation of different reports as required by the Team Leader and PD

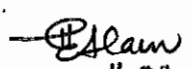
C. National Non-Key Experts:

Position	Qualifications	Tasks
Mathematical Modeling Specialist	B.Sc. in civil engineering/Water resource Engineering/Hydraulic Engineering. Preference will be given to higher degree. He/she should have 12 years working experience in the field of river hydraulics, river engineering and morphology with 10 years' experience in mathematical modeling of river hydraulics. Previous experience in similar environment will be preferred.	His/her major responsibilities shall include but not necessarily be limited to the following: - Establish the baseline hydraulic condition of the Project area; - Set-up, calibration and verification of 1D and 2D hydraulic model according to the necessity of the project; - Review and identify the need of updating and upgrading the available models; - Re-calibrate and validate the available models according to the necessity; - Assessment of the existing hydrodynamic conditions; - Simulation of different options for protection measures; - Interpret model results; - Interpret model results in accordance with the requirement; - Participation in meetings with BWDB as and when required; - Find the hydraulic design parameters for the proposed protective works; Any other instruction to be carried out as and when given by the superior and preparation of different reports as required for this project.
Mathematical Modeler	B.Sc. in Civil Engineering/Water resource Engineering/Hydraulic Engineering. He/she should have 8 years overall professional experience in water sector including 5 years' experience in the field of river hydraulics, river engineering and morphology including mathematical modeling of river hydraulics.	His/her major responsibilities shall include but not necessarily be limited to the following: - Establish the baseline hydraulic condition of the Project area; - Set-up, calibration and verification of 1D and 2D hydraulic model according to the necessity of the project; - Review and identify the need of updating and upgrading the available models; - Re-calibrate and validate the available models according to the necessity;

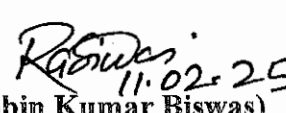
Position	Qualifications	Tasks
		- Assessment of the existing hydrodynamic conditions; - Simulation of different options for protection measures - Interpret model results; - Interpret model results in accordance with the requirement; - Participation in meetings with BWDB as and when required; - Find the hydraulic design parameters for the proposed protective works; - Any other instruction to be carried out as and when given by the superior and preparation of different reports as required for this project.
GIS and Remote Sensing Specialist	B.Sc. in Engineering/Masters in Geography/GIS and RS -5 Years Experiences	His/her major task includes but not limited to the following: - Analysis of the historical satellite images for assessing the river bank line shifting - Prepare the shape file layers of the project site, river training works, etc. - Digitize the mouja map, land acquisition layout plan. Any other instruction to be carried out as and when given by the superior and PD
ICT Expert/Programmer	B.Sc. in Computer Science & Engineering/ICT/Electrical & Computer Engineering - 10 Years Experience	His/her major task includes but not limited to the following: - Design and develop management information system - MIS for generation of IOL databank, reconciliation of databases from various sources (land acquisition, joint verification, census and IOL, replacement rates), determination of individual losses, calculation of compensation and entitlements, processing payment, determining item-wise progress and staff performance. - Compilation of all bidding documents, progress report, afforestation information, project dispute related issues & other resources documentation - Any other information regarding project implementation to be stored in MIS - Include all collected hydrological, morphological data, soil information, river cross sections, engineering design-drawing, registering of construction materials and its test result, etc. - Environmental Management Action Plan and Implementation, all information RAP and LAP - Any other instruction to be carried out as and when given by the superior and PD
Senior Estimator cum AutoCAD specialist	B.Sc. in Civil/water resources Engineering (8 Years Experience) / Diploma in Civil engineering (15 years' Experience) - Expert in AutoCAD-2D/3D	His/her major task includes but not limited to the following: - Prepare BOQ based on pre and post work survey data related to the river training activities. - estimate the quantity of items of construction works as per detailed design. - Assist Design Engineer as well as concerned BWDB design circles in preparing design drawings. - Provide necessary support regarding MIS development - Any other instruction to be carried out as and when given by the superior and PD

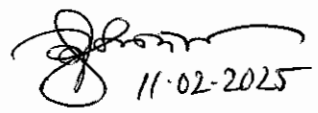
Position	Qualifications	Tasks
Senior Surveyor	Diploma in Survey Engineering -10 years' experience	His/her major task includes but not limited to the following: - Conduct pre and post work survey on the alignment of the river training works. - Perform the river morphological survey before construction, during construction and after construction of the works. - Conduct topographical, bathymetric, hydrometric survey and soil investigation using total station, DGPS, high frequency eco-sounder, ADCP and other necessary equipments etc. - Conduct associated bank line survey and topographic survey for LAP and embankment construction - Any other instruction to be carried out as and when given by the superior and PD


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Executive Engineer (Civil)
Office Of the Chief Engineer, Planning
BWDB, Dhaka
&
Member
ToR/RFP Review Committee

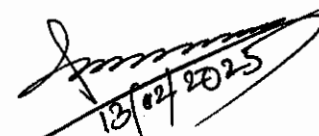

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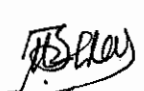

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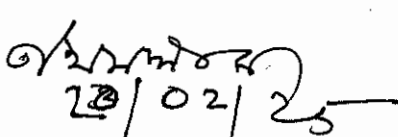

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ToR/RFP Review Committee


11-02-2025
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Additional Chief Engineer (Civil)
Office Of the Chief Engineer,
Planning
BWDB, Dhaka
&
Convenor
ToR/RFP Review Committee

As per the memo no: 42.01.0000.005.22.18-42; dated: 25 March, 2024, the ToR prepared has been reviewed and is hereby forwarded for approval.


13/02/2025
T. M. Rashidul Kabir
Project Director
JRSMP-1: (Component-1)
BWDB, Dhaka.

Recommended.

19/02/2025
(Md. Zohirul Islam)
Additional Director General
(Planning, Design & Research) (G.S.)
BWDB, Dhaka.

APPROVED

20/02/25
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