Government of the People's Republic of Bangladesh
Ministry of Water Resources

Bangladesh Water Development Board

Terms of Reference (ToR)
for
Consultancy Services for "Feasibility Study of Sustainable Management of Rivers in Dinajpur District."

February 2026

Table of Contents

1.1 Background

Dinajpur is one of the important agro-dependent districts in the north-western part of Bangladesh. About 33 rivers flow through this district in which Dhepa, Punarbhaba, Atrai, Kakra, Karatoya, Chhoto Jamuna, Garveshwari, Ichamati, Tangan, Ghrinai Karatoa and Nalshisha are the most important. The Atrai river of this district is a part of Atrai-Karatoya river and the Karatoya river of this district is a part of Karatoya-Jamuneswari river. The Atrai-Karatoya is a transboundary river originates from Shiliguri in India and enters Bangladesh through Panchagarh district in the name of Karatoya. It enters Dinajpur district at Jharbari of Birganj upazila and flows through Khansama, Birganj, Chirirbandar, Kaharole and Sadar upazilas in the name of Atrai river. The Atrai river again enters Bangladesh through Naogaon district and falls into the Gumani river at Bhangura upazila of Pabna district. Dhepa river originates from Atrai river in Mohonpur union of Birganj upazila in Dinajpur district and falls into Punarbhaba river in Farakkabad union of Birol upazila in Dinajpur district. Punarbhaba river originates from the lower region of Shibrampur union of Birganj upazila in Dinajpur district and flows through Birganj, Kaharole & Dinajpur Sadar Upazilas, then it enters India. The Punarbhaba river again enters Bangladesh through Naogaon district and falls into the Mohananda river at Gomostapur upazila of Chapainawabganj district. Garveshwari river originates from Atrai River in Sundarban Union of Dinajpur Sadar Upazila of Dinajpur District and flows into Atrai (Dinajpur) River in Shashora Union of Sadar Upazila of the same district. The Ghirnai-Karatoya river flows through Nawabganj, Parbatipur Upazillas of Dinajpur district. It originates from the lower region of Bangalipur union of Saidpur upazila of Nilphamari district and finally falls into the Karatoya (Nilphamari) river in Milanpur union of Mithapukur upazila of Rangpur district. Nalshisa River originates from the lower region in Palashbari Union of Parbatipur Upazila in Dinajpur District and falls into Karatoa (Nilphamari) River in Daudpur Union of Nawabganj Upazila of Dinajpur District. The Ichamati river originates from the lower region in Khokshabari union of Sadar upazila of Nilphamari district and flows through Khansama and Chirirbandar upazilas. It takes the name Chhota Jamuna in Mominpur union of Parbatipur upazila in Dinajpur district and falls into Atrai river in Kalikapur union of Atrai upazila of Naogaon district.

Due to the morphological changes of these rivers, the flow path is changing at different places in the rivers. The flash flood from the upstream area carries huge volume of sediment resulting excessive sedimentation in the channel bed. Consequently, water storage capacity of these rivers are decreasing. In addition to that, all of these rivers are experiencing flood and severe bank erosion due to excessive monsoon rainfall. The roads, houses, crop land along with government and non-government structure situated along the banks of the rivers flooded every year during monsoon and cause severe damage. It will be possible to protect the areas from river erosion if permanent river bank protection work is implemented in places vulnerable to erosion. Therefore, Proper management of rivers in Dinajpur district is essential for erosion management and flood control.

Mentionable that, Assessment of irrigation potential in Dinajpur district is ongoing under the component "Rehabilitation of Low Lift Pump Irrigation Projects in Dinajpur, Thakurgaon and Panchagarh District" of the project of BWDB titled "Feasibility Study for Updating Previous Study of North Rajshahi Irrigation Project and Rehabilitation of Low Lift Pump Irrigation Projects in Dinajpur, Thakurgaon and Panchagarh District."

Ghaghra is one of the important khals of Sadar upazila of Dinajpur district. The length of the Ghaghra khal is about 28 km which is very important for the people living in the Dinajpur city. The khal originates from the lower region of Amuir Mouza in Sundarban Union of Sadar Upazila of Dinajpur District, flows through Dinajpur town and falls into Punarbhaba River at Gauripur in Askarpur Union. Daily waste emerged from factories and houses build around the khal is filling up the khal and causing pollution. Consequently, the water retention capacity of the khal is decreasing. As a result, the drainage system is disrupted during monsoon. Improper drainage of water leads to waterlogging in various regions of the city and hampers normal life of people. In addition to that, crops are severely damaged

due to the water logging problem at the upstream of the khal. Therefore, management of Ghaghra khal along with Girijanath Khal and Ashurar beel is important for improving the drainage system and ecological balance of the area.

In view of the above, Bangladesh Water Development Board (BWDB) has formulated the proposal to study all the rivers and khals in Dinajpur district to devise a sustainable river management plan of the area.

1.2 Objective of the Consultancy Services

Overall Objective: The overall objective of the study is to identify all existing problems and to find out no-regret solutions for sustainable management of the rivers in Dinajpur district.

Specific objectives:

- Flood and erosion risk management of rivers within the study area;
- Improvement of water storage capacity of the rivers within the study area;
- Investigation of the hotspot locations for river bank protection work within the study area;
- Identification of drainage networks and improvement of drainage facilities of the study area considering climate change scenario;
- Propose various options for IWRM of the study area and identify the best option among the proposed solution methods;
- Design of proposed interventions related to hydraulic structures considering climate change scenario;
- Development of the River Dependent Area (RDA) under the framework of IWRM;
- Environmental and Social Impact Assessment;
- Preparation of DPP of the subsequent investment projects.

1.3 Scope of Works

The study will investigate the suitable solutions considering hydro-morphological change, future economic, social, environmental and climate change aspects of the study area. The activities and the scope of work for the assignment are as follows (but not limited to):

Data collection, survey and analysis:

- Collection and review of existing data, land mouza maps, information and relevant available study/technical/project reports;
- Collection of all necessary secondary data such as bathymetry data, surface water, ground water, sediment, discharge, rainfall, evaporation, river bed sediment, soil sample, satellite imageries and so on;
- Carry out bathymetric/cross-sectional survey of rivers/khals, topographic survey of embankment & floodplain, measurement of water level, water level slope, discharge, current speed, wave, sediment concentration and all relevant data according to data collection map;
- Identification of the historical erosion, bank shifting zone and hotspot area;
- Impact assessment of existing projects categorically and identification of problems;

- Identify the actual location (width of the khal) of the study khals according to the land mouza maps;
- Identify the nature and number of encroachments along the study khals;
- Detail mapping of rivers and its tributaries, distributaries and linkage canal, khal, road network, embankment etc;
- Develop a data collection map to conduct the study;
- Analyze the drainage congestion & flooding extent;
- Necessary soil boring and data analysis (c, Φ, liquidity limit, plasticity limit, d50 etc.) for each river (both bed and bank);
- Preparation of an inventory of hydraulic structures with present condition;
- Preparation of Area Elevation Curve for the basin of the study rivers;
- Preparation of flow distribution map, river conveyance map, flood plain identification, and danger level fixation;
- Performing Land Use and Land Cover (LULC) analysis for the flood plain map preparation of the rivers;
- Assessment of water demand for multi modal water usage sectors.

Assessment of hydrologic and morphologic characteristics:

- Examine the potential factors (hydrological, morphological, meteorological, hydro-morphological) influencing the flow of river regime;
- Application of appropriate one-dimensional (1 D) and two-dimensional (2D) model for:
    - hydrological, hydraulic and morphological analysis of the study rivers and canal;
    - identification of the vulnerable locations from the base model (without proposed measure condition);
    - assess the river bank protection strategy and to test its performance in terms of erosion restrain and sustainability;
    - investigation of alternative options to mitigate the erosion process such as excavation/dredging of existing islands/sand bars should be established using model results;
    - detailed analysis to retain surface water of concerned rivers through excavation/dredging or construction of water retention structures or a combination of both justified by model result to increase water storage capacity of concerned river;
    - analysis of the impact of the existing and proposed interventions on the hydro-morphological aspects of the river;
    - Preparation of flood inundation map showing extent and depth of inundation;
    - Assessment of long term impacts of surface water retention on groundwater recharge through the development of integrated surface water - groundwater interaction model.
- Determination of the slope profile, avg. scour depth, avg. shear velocity, and bed shear at several locations to help in decision making;
- Assessment of climate change impacts on the selected option.

Development of Planning and Design:

- Preparation of detailed engineering design & drawing of proposed interventions (bank protection work, flood embankment including re-sectioning and new construction, drainage canals, water management structures and water retaining structures etc.) and recommendation on hydraulic design parameters of the protective measure(s). Climate change impact should be incorporated in the design of flood embankment;
- Review of the design of the existing interventions and recommend for improving the existing design system;
- Recommendation to alleviate water logging problem of the study area;
- Recommendation for waste water management by concerned Authority.
- Identify existing navigation facilities and study potential of improving navigation through creating interconnecting links between the rivers/khals and its maintenance plan;
- Fixing the dredging alignment, design and estimating the volume of capital and maintenance dredging if needed;
- Preparation of dredged material management plan ensuring beneficiary use of the dredged material and following The Dredging and Dredged Material Management Policies 2025 (with sketch map);
- Preparation of land acquisition and resettlement action plan (if necessary);
- Plan for afforestation and exploration/development of park/ walkway for recreational purposes along bank protection works.
- Incorporating the Delta Appraisal Framework (DAF) to align with the goals of BDP 2100 and principles of Adaptive Delta Management (ADM)
- Analysis of the alignment of the project with the existing policy, Plan and Act.
- If required, additional works will be carried out in accordance with the decisions taken in the inception, interim and other meetings to ensure successful project outcomes, considering field conditions.

Assessment with respect to Environmental Sustainability, Climate Resilience, and Disaster Risk Analysis:

- Analysis for Environmental Sustainability, Climate and Disaster Resilience with a special emphasis on drought condition;
- Disaster Impact Assessment (DIA);
- Analysis of the demand of the project components as well as identification of the strength, weakness, opportunities and threat of the proposed interventions;
- Risk (uncertainty) and sensitivity analysis of the proposed interventions;
- Investigate the institutional and legal requirement during implementation of the proposed interventions;
- Planning the counter measures to reduce/mitigate these negative impacts;
- Determination of costs for reducing/mitigating the negative impacts;
- Finding alternative ways of the project deliverables without incurring these environmental costs;
- Selecting contingency plan for emergency disaster management and drought management.

Environmental and Social Impact Assessment:

- Establishment of physical, environmental and social baseline condition;
- Conduction of socio-environmental survey through appropriate tools & process to establish important environmental issues and to identify important environmental components;
- Conduct KII, FGD and discussion session for communicating with local beneficiaries;
- Selection of valued environmental and social components impacted by the existing and proposed interventions in the project area;
- Identification of important ecosystem (land/aquatic) and measures for conservation/restoring of the ecosystem of the study area;
- Plan for community based approach for internal water management, institutional development and early flood warning system;
- Assessment of the quality of the surface water, ground water and soil sample of the study area;
- Identification of rare species within the project area and propose community based ecosystem management plan for ecological equilibrium;
- Environmental & Social Impact Assessment (ESIA) study due to implementation of the project interventions;
- Preparation of Environmental Management Plan (EMP) for conservation of wetland, aquatic resources, fisheries resources, bird sanctuaries etc.;
- Preparation of environmental enhancement and conservation plan;
- Preparation of Terms of References (ToR) for ESIA and getting approval of the ToR from Department of Environment (DoE);
- Preparation of Environmental and Social Impact Assessment (ESIA) report following approved format of DoE, and presentation of EIA report at the DoE in getting requisite clearance certificate thereof;
- Using the DAF tool to assess potential environmental and socio- economic impacts under present and future climate change and socio-economic uncertainties including demographic changes.

Economic and Financial Analysis:

- Preparation of cost estimate of the project works as per DPP format on the basis of recent actual schedule of rates of concerned circle of BWDB;
- Estimation of Benefits to be derived after implementation of the proposed project;
- Estimation of Benefit Cost Ratio (BCR), Economic Internal Rate of Return (EIRR), Net Present Value (NPV) of each planning option based on the with and without project situation;
- Detailed financial and economic analysis.

Workshop, Training and Reports:

- Arrangements of workshop and consultation meetings for disseminating the study results to relevant stakeholders;
- Arrangements of trainings;

- Preparation of Inception Report, Progress Report, Interim, Draft Final and Final feasibility study report according planning commission format compiling the technical, social, environmental and economic aspects;
- Preparation of ESIA Report;
- Submission of reports including all findings.

1.4 Expected Output

The outputs of the study that can be provided are as follows:

- Land Mouza Map, data collection map, flow distribution map, river conveyance map, Flood Plain Map with inventory of existing structures as well as embankments and Flood Inundation Map, Area Elevation Curve;
- Identified the actual location of the study khals and find out the nature and number of encroachments along the study khals;
- Ground Water Mapping with possible drawdown of ground water table;
- Development of a drought management plan;
- Identified hotspot locations affected by bank erosion, bank shifting zone and silted reaches within the river requiring protective work for erosion control;
- Recommendation for improving the existing design system;
- Recommendation for improving the navigation through creating interconnecting links between the rivers/khals and its maintenance plan;
- Recommendation for waste water management by concerned Authority;
- Recommendation on the dredging, locations and type of water retention structures, bank protective measures to protect vulnerable river banks and flood control embankment at selected reaches;
- Analysis of the probability of water reservoir for feeding the study rivers during dry season;
- Water level, bed slope, discharge, rainfall, evaporation, sediment concentration etc. of the study rivers;
- Maximum depth of scour and flow velocity at or along suggested river bank protective works;
- Analysis of soil data;
- Monitoring plan to safeguard threatened river banks;
- Detailed design and drawings of bank protective works, flood embankment, drainage structures and water management structures;
- Plan for afforestation and exploration/development of park/ walkway for recreational purposes along bank protection works;
- Cost estimate of proposed interventions;
- Adverse impacts (if any) on bank erosion and flooding situation at the upstream or downstream of the study area due to construction of the interventions;
- Recommendation on the impacts of climate change due to implementation of the project;

- Environmental and Social baseline condition of the project and ESIA of proposed interventions;
- Environmental and Social Management Plan (ESMP) including:
    - Mitigation Plan;
    - Enhancement Plan;
    - Compensation Plan;
    - Conservation plan;
    - Environmental Monitoring Plan.
- ToR of ESIA duly approved from DoE;
- ESIA report in approved format of DoE and requisite clearance certificate from DoE;
- Risk analysis for environmental sustainability, climate resilience and disaster;
- Analysis of the alignment of the project with the existing Policy, Plan and Act;
- Land Acquisition Plan and Resettlement Action Plan if necessary;
- Legal requirements during implementation of the proposed project interventions.
- Feasibility Study report of the overall development plan (Prescribed Feasibility study report format of Planning Commission by following the indicators of DAF).

1.5 Duration of the Service and Reporting

The duration of the consultancy service is 10 months. The following are the reporting schedule for submission of the study reports in colour prints where necessary.

Sl. No.	Report	No of copies	Schedule (with reference to consultancy period)
1.	Inception Report	20 copies	At the end of 1st month
2.	Progress Report	5 copies	At the end of 3rd, 7th and 9th month
3.	Interim Report	20 copies	At the end of 5th month
4.	Draft Final Report with detailed design. * Detailed design should be submitted with DFR duly vetted by concerned Design office of BWDB.	20 copies	Within 21 days of 10th month
5.	Final Report	20 copies	At the end of 10th month from the date of commencement of the study. Incorporating all comments and suggestions received from different concerned offices.

It is noted that all models developed/ updated under this project, hard and soft copies of the reports, data, cross sections, shape files, documents, etc. and all other relevant information have to be submitted with Final Report. All the reports should be submitted in book binding format with name of the project on the shoulder, design and maps on A3 papers & colored reports.

The Project Director (PD) will represent BWDB and receive all the deliverables mentioned above. Review meetings with participation of concerned Planning, Design and Field level officials of BWDB will be held on Inception, Interim and Draft Final Reports.

1.6 Dissemination of Study Results

Field workshop/public consultation shall be arranged to share the study results with the local stakeholders before finalization of the study report. Consultants will arrange the field workshop in close consultation with the Project Director, BWDB, Dhaka & field level officials, BWDB and will make arrangement to share the results of the study.

The findings and recommendations of the study should be presented in the workshop/public consultation and acceptable feedbacks/outcomes from the participants would be incorporated, as required, in the Final Report.

1.7 Duties and responsibilities

BWDB's responsibilities:

The Consultant will work under the direct supervision of the Project Director (PD). H/She will ensure that the objectives of the study as detailed in the ToR would be achieved within agreed time schedule and that the contents of the report are acceptable to GoB. H/She will direct the planning process and work program and supervise the study and monitor progress according to the objectives set in ToR.

The hydrology offices of BWDB shall cooperate the Project Team as required, particularly with regard to the hydrological aspect of the study. It shall also ensure the involvement of respective design and field offices in survey works, field data collection and modelling activities. The concerned Design Circle of BWDB shall provide guidance in the design of major structures as required. The design office will vet the drawings prepared by the consultants so that the drawings can be used in the preparation of DPP. Field survey and field data collection will be done by the respective Consultants in close consultation with the concerned field Executive Engineer under the guidance of the Superintending Engineers of the concerned water development circles of BWDB.

The PD will arrange regular meetings between the consultants and BWDB professional to discuss technical and project management issues. Any unresolved issue either technical or otherwise should be consulted with the high officials of BWDB (Chief Engineer (Civil) Planning; concerned Zonal Chief Engineer; Chief Engineer, Hydrology; Chief Engineer, Design) or other GoB agencies as required.

BWDB should provide or make available the following data, services and facilities to the consultants, as per existing rules of BWDB:

- Available hydrological, morphological, meteorological data and records on concerned rivers;
- Available relevant contour maps and previous study reports;
- Any other support, available with BWDB, to help the consultants to carry out the data collection program as per ToR.

Any unresolved issues either technical or otherwise shall be taken up with BWDB senior technical personnel and will be met amicably.

Consultant's responsibilities

The consultant should carry out the services as detailed in "Objectives, Scope of Works, Expected outputs and ToR" in the best interest of the Government with reasonable care, skill and diligence with sound technical, administrative and financial practices. The Consultants will be responsible to BWDB for discharge of responsibilities. All the primary and secondary data, developed and updated models, maps, consultation information, notes on the interviews and other relevant audio and video clips collected during the evaluation process would be handed over under the rights of BWDB. In response to that, the consultant should-

- Make available all developed/updated models, primary and secondary data (entire set of information involving audio-visual recordings) to BWDB as and when required. Data and information should be submitted to BWDB both in hard and soft copies;
- Make necessary arrangements for site investigation, environmental and social survey & data collection as required for performance of the assigned task and evaluation thereby;
- Provide all support for the effective delivery of the services as stipulated in the objectives, scope of works, expected outputs and ToR;
- All types of technical support (like preparation of maps on necessity of BWDB and any other information related to the task the consultant is assigned with) should be provided to BWDB;
- Consult regularly with the concerned field office and design circle of BWDB during field survey and design preparation;
- All the stakeholder consultation sessions should be recorded for future documentation. Video recording would be done and the clips should be handed over BWDB. Discussants would be introduced with necessary introductory information and mobile phone number duly incorporated in the reports. Discussion points should be focused properly and addressed accordingly;
- Provide necessary assistance during DPP preparation of the subsequent implementation project.

1.8 Key and Non-Key Personnel

(a) Key Personnel

It is expected that 32 man-months (MM) of 08 key professionals will be required for the study as shown as follows:

Sl. No.	Professional	Nos.	Man-Month
1	Team Leader	1	6
2	Deputy Team Leader /Integrated Water Resources Management Specialist	1	8
3	Mathematical Modelling Specialist	1	4

Sl. No.	Professional	Nos.	Man-Month
4	Drainage and Irrigation Management Specialist	1	2
5	Senior Design Engineer (Civil)	1	3
6	Environmental Specialist	1	3
7	Social, Resettlement & Land Acquisition Expert	1	4
8	Climate Change & Disaster Management Expert	1	2
Total		**8**	**32**

(b) Non-Key Personnel

It is expected that 40 man-months (MM) of 12 Non-key professionals will be required for the study as shown as follows:

Sl. No.	Professional	Nos.	Man-Month
1	Hydrologist	1	3
2	Design Engineer (Civil)	1	4
3	Mathematical Modeller	1	4
4	Survey Specialist	1	3
5	GIS and RS Specialist	1	2
6	Co-ordination Consultant	1	6
7	Fisheries and Ecological Expert	1	2
8	Economist	1	2
9	Estimator	1	2
10	Data Analyst	3	12
Total		**12**	**40**

1.9 Task and Qualifications of the Professionals

(a) Key Personnel

Discipline	Qualifications and Tasks
Team Leader	***Qualification:*** He/ She should have Bachelor's Degree in Civil Engineering/Water Resources Engineering. Preferance will be given to higher degree. He/she should have overall 20 years' professional experience in river engineering and water resources engineering with 15 years' experiences in the relevant management, including leading and managing a multidisciplinary team for drainage management, water resources planning, drainage structure design, disaster management, river hydraulics, bank protective works and river morphology particularly in Bangladesh.

Discipline	Qualifications and Tasks
	Tasks: His/her major responsibilities shall include but not necessarily be limited to the following: • Take full responsibility for all aspects of planning, liaison and reporting of the study; • Guide and supervise the survey, modelling and design activities; • Coordinate the study activities; • Take necessary steps to collect existing data from external sources if available and required; • Arrange interaction meeting with BWDB personal to disseminate the study results; • Attend meeting as and when required by the dseignated responsibility of BWDB; • Take reponsibility for the quality of the model upgrading and development of tool; • Analyze and interpret the mathematical modeling results for technical and economical justification; • Maintain liaison with BWDB and other related agencies; • Review previous investigation and studies related to this study; • Quality control of the analysis of erosion, river characteristics and drainage condition and modelling; • Carry out overall co-ordination and top supervision of the different study activities and maintain close liaison with the client; • Preparation of Environmental and Social Impact Assessment (ESIA) report following approved format of DoE and taking necessary steps for getting requisite clearance certificate; • Preparation of Environmental and Social Management Plan (ESMP) for conservation of wetland, aquatic resources, fisheries resources, bird sanctuaries etc.; • Analysis for Environmental Sustainability, Climate and Disaster Resilience; • Review the existing policy and laws relevant to ESIA study. • Preparation of cost estimates for the project; • Preparation of all reports as needed under the contract; • Attending meeting as and when required;

Discipline	Qualifications and Tasks
	• Co-operation in DPP preparation; • Disseminate monitoring results to all stakeholders.
Deputy Team Leader/ Integrated Water Resources Management Specialist	***Qualification:*** Bachelor's degree in Civil Engineering/Water Resource Engineering. Preferance will be given to higher degree. He/she should have overall 15 years working experience in water sector with 12 years' experience in the relevant management including managing a multidisciplinary team for drainage management, water resources planning, drainage structure design, disaster management, river hydraulics, sediment transportation, dredging and management of dredged material, bank protective works and river morphology particularly in Bangladesh. ***Tasks:*** His/her major responsibilities shall include but not necessarily be limited to: • Guide and supervise the survey, modelling and design activities; • Coordinate the study activities; • Arrange interaction meeting with BWDB personal to disseminate the study results; • Attend meeting as and when required by the dseignated responsibility of BWDB; • Take reponsibility for the quality of the model upgrading and development of tool; • Analyze and interpret the mathematical modeling results for technical and economical justification; • Formulate alternative options/structures to be recommended for river training works and dredging; • Comparison of alternatives and find out suitable solutions; • Evaluate the effectiveness of different options as well as dredging; • Planning and selection of cost effective re-excavation works; • Identify lands and also owners of the land suitable for dumping of excavated earth; • Preparation and dredging management plan and management of dredged earth material; • Development of a drought management plan;

Discipline	Qualifications and Tasks
	• Development of Ground Water Mapping with possible drawdown of ground water table; • Maintain liaison with BWDB and other related agencies; • Quality control of the analysis of erosion, river characteristics and drainage condition and modelling; • Assist in preparation of Environmental and Social Impact Assessment (ESIA) report following approved format of DoE and taking necessary steps for getting requisite clearance certificate; • Assist in preparation of Environmental and Social Management Plan (ESMP) for conservation of wetland, aquatic resources, fisheries resources, bird sanctuaries etc.; • Analysis for Environmental Sustainability, Climate and Disaster Resilience; • Review the existing policy and laws relevant to ESIA study. • Preparation of cost estimates for the project; • Preparation of different reports as required for the proposed study. • Co-operation in DPP preparation;
Mathematical Modelling Specialist	***Qualification:*** He/she should have Bachelor's Degree in Civil Engineering/Water Resources Engineering. Preferance will be given to higher degree. He/she should have overall 15 years working experience in the field of bank protective works, river hydraulics, sediment transportation and river morphology with 12 years' experience in morphological and hydrodynamic modelling of rivers. ***Tasks:*** His/her major responsibilities shall include but not necessarily be limited to: • Detailed analysis of time series satellite images and bathymetric/ hydrographic charts and other surveyed data to ascertain coastline movement, erosion-deposition pattern and sediment transport characteristics; • Analyze and interpret historical data as well as surveyed data of the river; • Establish the baseline hydraulic condition of the study area;

Discipline	Qualifications and Tasks
	• Set-up, calibration and verification of 1D and 2D hydrodynamic and morphological model according to the necessity of the project; • Analyse the model results, establish hydrodynamic and morphological characteristics of the river and identification of erosion vulnerable area; • 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; • Assessment the need of river training work; • Simulation of different options for protection measures and river training works; • Interpret model results in accordance with the requirement; • Find the hydraulic design parameters for the proposed protective works; • Participation in meetings with BWDB as and when required; • Prepare reports to a standard format acceptable to BWDB; • Collect and incorporate comments on final report; • Assist the team leader in coordinating the study; • Prepare workshop materials and to assist the workshop coordinator.
Drainage and Irrigation Management Specialist	***Qualification:*** He/she should have Bachelor's degree in Civil Engineering/Water Resources Engineering/Agricultural Engineering. Preferance will be given to higher degree. He/she should have overall 15 years working experience in water sector including 12 years in the field of irrigation and drainage related project. ***Tasks:*** His/her major responsibilities shall include but not necessarily be limited to the following: • Carry out irrigation and drainage management related data collection; • Considering the water availability and physical constrains, suggest future cropping pattern;

Discipline	Qualifications and Tasks
	• Assessment of total irrigation and drainage management requirement; • Contribute in report writing and review milestone report.
Senior Design Engineer (Civil)	***Qualification:*** He/she should have Bachelor's degree in Civil Engineering/Water Resources Engineering. Preferance will be given to higher degree. He/she should have overall 15 years' professional experience in water sector including 12 year's working experience in the design of hydraulic structures and bank protective works. ***Tasks:*** His/her major responsibilities shall include but not necessarily be limited to the following: • Establish the criteria for hydraulic design of the proposed protective works and drainage structures using different design guidelines; • Formulate and design of the alternative structures recommended for the river training works. • Designing of the proposed interventions; • Preparation of cost estimate of the structures on the basis of recent actual schedule of rates including annual expenditure schedules; • Comparison of the alternatives and find out the suitable solution; • Developed design specifications and drawing; • Finalize cost estimate of different protective measures; • Participation in meetings with BWDB as and when required; • Preparation of different reports as required for the proposed study; • Assist the team leader in coordinating the study.
Environmental Specialist	***Qualification:*** He/she should have Bachelor's Degree in Civil/Water Resources Engineering/ Masters' degree in Geography/ Masters' in Environmental Study or in any relevant field. Candidate should have formal training in carrying out EIA. Should have professional experience of overall 12 years in water sector including 10 years' experience in the field of EIA. ***Tasks:*** His/her major responsibilities shall include but not necessarily be limited to:

Discipline	Qualifications and Tasks
	• Make inventory of present environmental situation; • Carry out Environmental Impact Assessment; • Preparation of Environmental Monitoring & Management Plan; • Co-ordinate relevant activities and assist the Team leader; • Attend meeting as and when required; • Assist in preparation of Final Report with EIA.
Social, Resettlement & Land Acquisition Expert	***Qualification:*** He/she should have Master's degree in Sociology/ Social Welfare. He/she should have overall 12 years' experience in the field of sociology including 10 years' experience in sociological activities & field survey as well as in land acquisition and resettlement. ***Tasks:*** His/her major responsibilities shall include but not necessarily be limited to: • Intensive Field visit for collecting views of the local people, their present socio-economic activities and problems including present situation in the vicinity of Project Area; • Holding interaction meeting with the stakeholders at field level holding Focus Group Discussion (FGD), Target Group Discussion (TGD) and workshops/seminars at field level to find out the desired goal of the study and to disseminate the results; • Find-out the conflicting issues, conduct motivational works among the stakeholders against any negative issue and to suggest mitigation measures; • Point out the functional structure and institutional capacity of BWDB (in terms of both Technical and Financial) required for implementation and operational stages of the project; • Identify whether the project matches with the allocation of business or mandate of the project entity; • Illustrate the legal restrictions (if any) that may obstruct or impede the project during its implementation and functional stage of the project outputs; • Identify the challenges of cross – cutting issues and suggest its mitigation strategy during implementation and functional stage of the project outputs;

Discipline	Qualifications and Tasks
	• Demarcation of the existing acquired land/disputed land (if any) on CS/RS map under this project; • Analysing and interpreting the data on CS/RS map; • Formulate a Land Acquisition Plan (LAP) and Resettlement Action Plan (RAP) for project components;
Climate Change & Disaster Management Expert	***Qualification:*** He/she should have Bachelor's degree in Civil Engineering/ Water Resources Engineering or Master's Degree in Disaster Management/ relevant natural sciences. He/ She should have 12 years' overall experience in similar nature of works including 10 years' professional experience in the field of climate change and disaster management. ***Tasks:*** His/her specific tasks are: • Identify the environmental, disaster and climate change impacts or risks from the project; • Assessment of disaster resilience of the project which should include contingency plan for emergency disaster management, business continuity plan, time of recovery and reporting of residual risk; • Co-ordinate relevant activities and assist the Team leader; • Attend meeting as and when required; • Assist in preparation of DIA and climate change & vulnerability related EIA part of Final Report as per the format of feasibility study.

(b) Non-Key Personnel

Discipline	Qualifications and Tasks
Hydrologist	***Qualification:*** He/she should have Bachelor's degree in Civil/Water Resources Engineering. Preferance will be given to higher degree. He/she should have overall 12 years working experience in water sector including 10 years' experience in hydrological analysis and hydrological modelling. ***Tasks:*** His/her major responsibilities shall include but not necessarily be limited to the following:

Discipline	Qualifications and Tasks
	• Review of the river systems and available data; • Development of hydrological and hydrodynamic model for river systems; • Simulate hydrological and hydrodynamic conditions of rivers; • Establish design parameters from simulation results; • Analysis simulation results; • Contribute in preparing the reports of the study and workshop materials.
Design Engineer (Civil)	***Qualification:*** He/she should have Bachelor's degree in Civil Engineering/Water Resources Engineering. Preferance will be given to higher degree. He/she should have overall 10 years' professional experience in water sector including 8 years' experience in the design of hydraulic structures and bank protective works. ***Tasks:*** His/her major responsibilities shall include but not necessarily be limited to the following: • Assist in designing of the proposed interventions; • Assist in preparation of cost estimate of the structures on the basis of recent actual schedule of rates including annual expenditure schedules; • Assist in developing design specifications and drawing; • Cost estimate of different protective measures; • Participation in meetings with BWDB as and when required; • Preparation of different reports as required for the proposed study; • Assist the Senior Design Engineer in coordinating the study.
Mathematical Modeller	***Qualification:*** He/she should have Bachelor's Degree in Civil Engineering/Water Resource Engineering/ Hydraulic Engineering. He/she should have 10 years' overall experience in water sector including 8 years' working experience in the field of bank protective works, river hydraulics, sediment transportation and river morphology including morphological and hydrodynamic modelling of rivers. ***Tasks:*** His/her major responsibilities shall include but not necessarily be limited to: • Detailed analysis of time series satellite images and bathymetric/ hydrographic charts and other surveyed data to ascertain coastline movement, erosion-deposition pattern and sediment transport characteristics; • Analyze and interpret historical data as well as surveyed data of the river;

Discipline	Qualifications and Tasks
	• Establish the baseline hydraulic condition of the study area; • Set-up, calibration and verification of 1D and 2D hydrodynamic and morphological model according to the necessity of the project; • Analyse the model results, establish hydrodynamic and morphological characteristics of the river and identification of erosion vulnerable area; • 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; • Assessment the need of river training work; • Simulation of different options for protection measures and river training works; • Interpret model results in accordance with the requirement; • Find the hydraulic design parameters for the proposed protective works; • Participation in meetings with BWDB as and when required; • Prepare reports to a standard format acceptable to BWDB; • Collect and incorporate comments on final report; • Assist the team leader in coordinating the study; • Prepare workshop materials and to assist the workshop coordinator.
Survey Specialist	***Qualification:*** Bachelor's degree in Civil Engineering/Water Resources Engineering. He/she should have 10 years of overall experience in water sector including 8 years' experience in the surveying of relevant projects. ***Tasks:*** His/her major responsibilities shall include but not necessarily be limited to: • Formulate realistic field data collection plan & schedule; • Lead and supervise the field data collection team with necessary safety measures; • Maintain close and intensive co-ordination with the field officials of BWDB and the local people;

Discipline	Qualifications and Tasks
	• Participate in the survey work to be conducted for field data collection; • Inform the status and progress of the data collection activities regularly to the BWDB and other concerned; • Responsible for timely completion of data acquisition in accordance with the specification mentioned in the ToR; • Share all survey data with the Client for preserving those in BWDB; • Assist in the preparation of Reports.
GIS and RS Specialist	***Qualification:*** He/she should have Bachelor's degree in Civil Engineering/Water Resources Engineering/ Urban and Regional Planning/Hydrology/Geography. He/she should have 10 years' overall experience in water sector including 8 years' experience in producing GIS and RS coverage, Contour map, Digital Elevation Model in water sector. ***Tasks:*** His/her major responsibilities shall include but not necessarily be limited to the following: • Make GIS layer for location, river, road, settlements and other different features; • GIS analysis of river bank locations as GIS layer; • Prepare study area map based on recent satellite imagery; • Prepare GIS based maps for erosion and depositions and digitize coastlines from historical satellite imagery; • Preparation of ArcView based contour maps of basins, difference maps of basin bed topography; • Identify the important features such as existing embankment, khals, hill, wetland, regulators, bridges of the proposed area and preparation the map showing all the features; • Assist the study team in coastline migration analysis, • Preparing maps, charts in connection with the reports.
Co-ordination Consultant	***Qualification:*** He/ She should have Bachelor's degree in Civil Engineering/ Masters' of science or related field with 12 years' overall experience of which at least 10 years should substantially be related to coordinating administrative official work/project management in similar type of projects. ***Tasks:*** His/her major responsibilities shall include but not necessarily be limited to the following:

Discipline	Qualifications and Tasks
	• Attending meeting as and where required; • Maintain liaison with required other Government offices and agencies; • Assisting team leader in coordinating the study. • Arrange interaction meeting with BWDB personal to disseminate the study results; • Assist in the preparation of Reports.
Fisheries and Ecological Expert	***Qualification:*** He/ She should have Masters' degree in Fisheries with 12 years' overall experience including 10 years' experience in fisheries appraisal in water sector. ***Tasks:*** His/her major responsibilities shall include but not necessarily be limited to the following*:* • Studying the possible impact for the construction of embankment and dredging; • Preparation of Fisheries Management Plan if necessary; • Miscellaneous task as and when required; • Fisheries management implementation work schedule; • Also he/she will support the Environmental and Social Impact Assessment.

Discipline	Qualifications and Tasks
Economist	***Qualification:*** He/ She should have Masters' degree in Economics with overall experience of 8 years' in water sector including 5 years' experience in economic analysis of similar type of projects. ***Tasks:*** His/her major responsibilities shall include but not necessarily be limited to the following: • Appraisal of Project worthiness in terms of economic viability; • Elaboration of the feasibility level cost estimates, contingency amounts, detail price escalation estimates on the expected implementation schedule, administration cost and tax and duties shown as separate line items and the method of calculation of these costs; • Assessment of costs arising out of mitigation measures (or external dis-benefits); • Conclusion of socio-economic viability of each planning option and the Project as whole; • Assist the Team Leader in preparation of Final Report containing all the requirements of BWDB for the DPP.
Estimator	***Qualification:*** He/She should have Bachelor's degree in Civil Engineering/Water Resources Engineering having overall 5 years of experience in water sector including at least 3 years' experience as estimator in water resources sector projects/ Diploma in Civil Engineering having overall 10 years of experience in water sector including at least 08 years' experience as estimator in water resources sector projects. ***Tasks:*** His/her major responsibilities shall include but not necessarily be limited to: • Estimation of volume of earth works and related items for preparation of BoQ. • Assist design engineer as and when required.
Data Analyst	***Qualification:*** He/She should have Bachelor's degree in Civil Engineering/ Water Resources Engineering. He/she should have 5 years' overall experience in water sector including 3 year experience in the analysis of different types of data including sediment, discharge, water level, flow velocity etc. ***Tasks:*** His/her major responsibilities shall include but not necessarily be limited to the following:

Discipline	Qualifications and Tasks
	• Responsible for the collection of field data and data from different organizations; • Ensure data quality and prepare data needed for hydrological and morphological modelling and analysis; • Provided necessary support with data for other task required for performance by the Study Team; • Analyse of all the surveyed data; • Assist the study team for the preparation of different reports..

23.02.2026

(Nahid Nauaz)
Executive Engineer (Civil) (C.C)
Directorate of planning-2, BWDB, Dhaka &
Member-Secretary, ToR and Estimate Preparation Committee.

23.02.2026

(Dr. Mohammad Mahtab Hossain)
Superintending Engineer (Civil)
Directorate of planning-2,
BWDB, Dhaka &
Member, ToR and Estimate Preparation Committee.

23/02/26

(Md. Hafizul Alam)
Superintending Engineer (Civil)
Contract & Procurement Cell,
BWDB, Dhaka &
Member, ToR and Estimate Preparation Committee.

23.02.26

(Umme Mahfuza Haque)
Superintending Engineer (Civil)
Design & Research Circle-6, BWDB, Dhaka &
Member, ToR and Estimate Preparation Committee.

26/02/26

(Md. Aminul Islam)
Additional Chief Engineer (Civil) Planning (Addl. Charge)
Office of the Chief Engineer (Civil) Planning, BWDB, Dhaka &
Convener, ToR and Estimate Preparation Committee.

Approved.

25.02.2026.

(Md. Enayet Ullah)
ID No. 670705001
Director General
BWDB, Dhaka.