

**Government of the People's Republic of Bangladesh
Ministry of Water Resources
Water Resources Planning Organization**

**Amended Terms of Reference (ToR)
for
Consultancy Services for
Preparation of National Water Resources Plan (NWRP)**

under

**Preparation of National Water Resources Plan (NWRP) Project
(Project Code No. 223042400)**

**September 2021
Dhaka**

am

J

R

R

Table of Contents

Sl. No.	Topics	Page no.
1.0	Introduction	03
2.0	Objective	04
3.0	Scope of Works	05
4.0	Expected Output	09
5.0	Work Plan and Implementation Schedule	09
6.0	Professional input	09
7.0	Qualification and Responsibilities of the Personnel	10
8.0	Duration of the Contract	10
9.0	Major Deliverables	10
10.0	Reporting Requirement	11
11.0	Workshop/Seminar	11
12.0	Mode of Payment	11
13.0	Duties and Responsibilities	
	13.1 WARPO's Responsibilities	12
	13.2 Consultant's Responsibilities	12
Annexure-I	Tentative Wrok Plan/ Tasks Schedule	13
Annexure-II	Required Qualifications, Experiences and Responsibilities of the National Consultants	14-30

alu

1. Introduction

The National Water Management Plan (NWMP, 2001) was prepared during the period 1998-2001, which was approved by the National Water Resources Council (NWRC) on 31st March 2004. It is a framework plan for the government for the implementation of national Water Policy (1999); a guiding outline to formulate projects by the line agencies under 13 ministries and invest and make impact on water resources by private entrepreneur and development partners. The document is a rolling plan need to be updated periodically to incorporate the changes in the driving forces as knowledge grows. The Plan included a firm plan for five years (2001-2006), an indicative plan for the subsequent five years (2006-2011) and a perspective plan up to 2025. "Regional Technical Assistance (RETA) supporting IWRM (Bangladesh), April 2009" aided by ADB-GoN (Asian Development Bank-Government of Netherland) made some subjective analysis of the NWMP implementation and with several recommendations setting direction of NWMP preparation.

In May 02, 2013 the Government of Bangladesh enacted the Bangladesh Water Act, 2013 after a series of extensive consultation process. The Act explicitly (Article 15.1) mentioned that, "As soon as possible, after the commencement of this Act, the Water Resource Planning Organization shall, through Executive Committee, place for approval before the Council a draft of the National Water Resources Plan prepared in accordance with the Water Resources Planning Act, 1992 (Act No. XII of 1992). Bangladesh Water Act, 2013 in article 15.2 has directed to include the following in the preparation of NWRP:

- a) Geographical location of the water resources and description with mouza map;
- b) Analysis on the economic, natural, social, political, environment and eco-system and institutional ingredients, characteristics and impact;
- c) Scientific analysis of all data and information on water resource;
- d) Development of overall planning, infrastructure for extraction, distribution, use, protection and preservation of water resource and direction for short term, medium term and long term planning on these issues;
- e) Coordination among water resource related ministries, directorates, organizations and institutions;
- f) Present and future use of water resources;
- g) Maximum use of rain water along with coordinated use surface water and underground water;
- h) Determining the benefit of water;
- i) Ensuring the quality of water;
- j) Delta-based development planning; and
- k) Prepare priority list of the use of water.

In this backdrop WARPO has taken the initiative to prepare National Water Resources Plan (NWRP) considering NWMP as baseline document for the implementation of Bangladesh Delta Plan 2100.

Moreover, The Government of Bangladesh has approved the Bangladesh Delta Plan 2100, which has addressed many specific issues in water sector, especially in the Strategy part volume-1 where in the chapter 4: National and Transboundary Water Management, chapter 5: Adaptive Delta management, Delta Vision, Missions, Goals and Policy Options, chapter 6: Managing water Resources and the Baseline study on Water Resource Management, volume 1 that needs to be focused in the NWRP. Under these circumstances, the preparation of NWRP is a crucial need.

alu



Since the completion of formulation of NWMP in December 2001 new problems, objectives and new priorities of actions have emerged; there are some issues to be looked into afresh, e.g. climate change (sea level rise), arsenic contamination and salinity intrusion in Groundwater, Pollution of Surface water (SW), quality of Groundwater (GW) and declination of GW level, cooperation of co-riparian countries, international policy and strategy, economic growth, changes in population growth pattern, urbanization trend, natural resources, social and political development, land management, disaster management, water and sanitation, strategic planning, pandemic management etc.

The proposed plan has to be the potential to implement the BDP 2100 goals in the advanced scientific way and provide strong direction to the accelerated poverty reduction planning process. New policies strategies e.g. National Water and Sanitation Policy 1998, National Water Policy 1999; Land Use Policy 2001; National Policy for Arsenic Mitigation 2004; Pro-Poor Strategy for Water and Sanitation Sector in Bangladesh 2005; National Environmental Policy 2018; National Sanitation strategy 2005 etc. need to be reflected in the formulation of strategies and actions in the NWRP in the compliance with Bangladesh Water Act 2013 (BWA) and the Bangladesh Delta Plan 2100 (BDP).

2. Objective

(i) Overall

The overall objective of the project is to prepare NWRP according to the direction of Bangladesh Water Act 2013, Water Resources Planning Act 1992 considering relevant other documents. The overall objective of the project has been set to prepare NWRP (in the backdrop of success and failure of NWMP 2001 and addressing the BDP 2100 strategies) incorporating the new perspective of water resources assessment, allocation, uses, conservation and protection addressing new emerging challenges ahead. Planning needs, institutional reforms, refining the long-term national water management strategy and revising the portfolio of programs of the NWMP for the medium and the longer term will be considered in the NWRP.

(ii) Specific

The specific objectives of the project are:

- To promote decentralize water management in Bangladesh through strengthening of framework to enable stakeholder participation in the water sector planning process and regular public review of progress
- Assess Bangladesh's water (both quality and quantity) resources and their medium and long term potential and constraints and to develop and establish a framework for systematic evaluation and assessment of the resources
- To promote conjunctive use of water
- To address uncertainty and adaptive planning ,
- Develop a longer-term basin wise management plan considering the delta dynamics.
- Assistance to the aquatic and water dependent ecosystem preservation
- To identify the water resources problems and integrated measures of different hydrological region considering BDP 2100 hotspots.
- Capacity building of WARPO To become a center of excellence for the systematic management of water resources

alv







3. Scope of Works

The overall scope of this service is to prepare NWRP (in the backdrop of success and failure of NWMP 2001) following the directives of Bangladesh Water Act 2013 (article 15). The service tasks comprises the following steps:

- a) Assessment of water resources with the description on present geographical location and mouza map;
- b) Investigation of groundwater use and its implication with the present development situation combining arsenic, salinity and other quality problems as long-term implication;
- c) Investigation of salinity intrusion in the coastal aquifer as a result of increase abstraction, anticipated sea level rise and define required strategy in the coastal area;
- d) Analysis of economic, natural, social, political, environmental, ecological and institutional elements, characteristics and impacts of water resources;
- e) Analysis of present and future use of water for setting priority of water use and proposing water quality standard;
- f) Development of overall planning, infrastructure for abstraction, distribution, use, protection and conservation of water resources, and formulation of instructions thereof for short, medium and long term;
- g) Integrated plan for use of surface and groundwater emphasizing the highest possible use of rain water;
- h) Investigation of existing measures in river maintenance, erosion control, land accretion and coastal zone management;
- i) Investigation on long-term implication of climatic changes and propose appropriate responses in the short, medium and long term plan looking into the dynamic issues in the delta;
- j) Carry out people's participation and the associated consultation process to incorporate people's needs, views and preferences during the preparation of NWRP;
- k) Preparation of Development Result Framework, Investment Plan under NWRP and NWRP monitoring tool;
- l) Institutional Coordination Plan with concerned Ministries, Divisions and Organizations involved in the management of water resources;
- m) Water use plan;
- n) Monitoring report on uncertainty;
- o) Hilsha Migration Study and biodiversity study for NWRP locations; and
- p) Study on Water Export Potentiality

Moreover, the scope of works will also incorporate into the activities of log frame discussed as following:

alu R

R

R

Log Frame of the project

	Narrative Summary	Objectively verifiable indicators (OVI)	Means of verifications (MOV)	Important Assumptions (IA)
Goal	To promote rational/landwise use of Bangladesh Water Resources.	<ul style="list-style-type: none"> 100% water resources Project cleared by WARPO Number No objection certificate for deep-tube well Regulatory and cost recovery statistics Demand driven development Institutional comparative advantage Number industries complies with industrial water use policy The ministries consider BWA,BWR, BDP2100 and IWRM in planning new projects 	<ul style="list-style-type: none"> Regular flow of data in NWRD WARPO APA report WARPO Website Agency (BMDA, LGED, BWDB) reports. Ministry website 	
Objective/Purpose	<ul style="list-style-type: none"> To prepare a plan for exploring the activities mentioned in BWA, 2013 and to support the BDP2100 implementation with scientific data and information. To promote decentralize Water Management by pursuing IWRM Assess Bangladesh's water (both quality and quantity) resources and their medium and long term potential and constraints To promote conjunctive use of Water To address uncertainty and adaptive Planning Develop a longer term basin wise plan considering the delta dynamics. To preserve the aquatic and water depended ecosystem 	<ul style="list-style-type: none"> % of NWRP implementation Union, Upazila, District integrated water resources guidelines followed Water Resources Assessment report Socio economic baseline survey Yearly Monitoring report NWRP/ECNWRP meeting held Stakeholder consultation meeting held Local level stakeholder meeting held Water quality report Status of indicator species Knowledge, Attitude and practices (KAP) survey 	<ul style="list-style-type: none"> WARPO reports IMED report WARPO website MoWR website WARPO annual report 	<ul style="list-style-type: none"> Strengthening of LGIs ADP budget allocation Political commitment

alu

g

[Handwritten signature]

	Narrative Summary	Objectively verifiable indicators (OVI)	Means of verifications (MOV)	Important Assumptions (IA)
Output	<p>i) Framework Plan</p> <p>i) Draft NWRP Plan, A consensus document consolidating the policy and strategy framework set by Government, within which water sector plans are to be developed. It will include an investment portfolio of national, regional and sub-regional projects prepared by sector agencies and screened by WARPO</p> <p>ii) Basin wise Plan</p> <p>iii) Priority of Water Uses Plan</p> <p>iv) Institutional Coordination Plan</p> <p>v) Preparation of Development Results Framework (DRF)</p> <p>vi) Preparation Monitoring Tools</p> <p>vii) Preparation of Investment Plan</p> <p>ii) Scenario Analysis Report</p> <p>i) Analysis of Water Resources (Environmental, Ecology, Socio-Economic, Political, Institutional)</p> <p>ii) Short, Medium, Long term Planning of WR, identifying structural and non-structural measures and their expected impacts to be implemented at national and regional level</p> <p>iii) Present and Future Uses of WR</p> <p>iv) Conjunctive use of WR</p>	<ul style="list-style-type: none"> • Draft NWRP report prepared • Basin wise report prepared • Water use report provided • Institutional development report provided • Scenario report prepared based on availability of WR, Short, Medium, Long term Planning, Present and Future Uses of WR, Conjunctive use WR, Salinity, Hilsa Migration Route, Water Export, Biodiversity, Environmental, Ecology, Socio-Economic, Political, Institutional aspects. • WR assessment report completed • Draft investment Plan prepared • Special Studies on modelling completed • Monitoring Tools prepared • Development of Result Framework prepared 	<ul style="list-style-type: none"> • WARPO website, • WARPO annual report • Meeting Minutes • GIS maps • Time series database • Mid-term Evaluation Report • WARPO reports in the library • APA report • Examination of NWRD 	<ul style="list-style-type: none"> • Extreme Climate event • Political commitment and instability • Global market change

aku



92



	Narrative Summary	Objectively verifiable indicators (OVI)	Means of verifications (MOV)	Important Assumptions (IA)
	v) Salinity Intrusion vi) Hilsa Migration Route vii) Biodiversity iii) WR (Surface water and Groundwater) assessment report i) Surface water and groundwater Quantity report ii) Surface water and groundwater quality report iii) Groundwater aquifer mapping report iv) Water Export			
Input: <ul style="list-style-type: none"> • Study documents (NWMP, BDP2100, NWPo1999, BWA'2013, BWR'2018 etc.) • Manpower • Data collection • Services from National consultants. • Feedback from Workshop/ Seminar • Funding • Goods and equipment's to be procured • District Office of WARPO • Local and foreign Training 		<ul style="list-style-type: none"> • 100% Local and foreign Training within project period • Number of Stakeholder consultation over the project period • 100% of district set up within June 2021 • National Consultation Workshop • 100% manpower and consultant to be procured 	<ul style="list-style-type: none"> • TAPP of the project • Minutes of coordination meetings. • Mid-Term Evaluation Report • WARPO Website 	<ul style="list-style-type: none"> • ADP budget allocation • Sustainable Funding • Non approval of WARPO's district manpower

alu 



gr

4. Expected Output

The prepared National Water Resources Plan will have three boarder frames of outputs. These are:

- **Framework Plan**

- i) Draft NWRP Plan, A consensus document consolidating the policy and strategy framework set by Government, within which water sector plans are to be developed. It will include an investment portfolio of national, regional and sub-regional projects prepared by sector agencies and screened by WARPO
- ii) Basin wise management plan
- iii) Priority of Water Uses Plan
- iv) Preparation of Development Results Framework (DRF)
- v) Preparation Monitoring Tools
- vi) Preparation of Investment Plan
- vii) Institutional Coordination Plan

- **Scenario Analysis Report**

- i) Analysis of Water Resources (Environmental, Ecology, Socio-Economic, Political, Institutional)
- ii) Short, Medium, Long term Planning of WR, identifying structural and non-structural measures and their expected impacts to be implemented at national and regional level
- iii) Present and Future Uses of WR
- iv) Conjunctive use of WR
- v) Salinity Intrusion
- vi) Biodiversity and Hilsha Migration Route
- vii) Water Export Study

- **WR (Surface water and Groundwater) assessment report**

- i) Surface water and groundwater Quantity report
- ii) Surface water and groundwater quality report
- iii) Groundwater aquifer mapping report
- iv) Water Export Potentiality

Along with above outputs the Plan will have the following outputs also.

- **Instruments:** A People's Participation and Consultation System (PPCS) to support future planning efforts, criteria and procedures for screening projects for inclusion in the investment.
- **Database:** A reference database on related aspects of water resources planning and operationalizing the Bangladesh Water Act 2013.
- **Reports:** A series of working papers and reports providing background to technical aspects of the supporting studies and recommendations on institutional, legislative, economic and environmental issues.

5. Work Plan and Implementation Schedule

The work plan and the implementation schedules of the study are to be submitted by the procured Personnel before commencement of the study. Tentative Work Plan/Schedule is attached here as **Annexure-I**.

6. Professional input

The overall period for the esteemed service has been estimated upto December 2022 from the date of commencement. Consulting firm will be responsible to arrange training programme as a part of

ala



technology transfer. Resource persons will be nominated in consultation with the Project Director (PD). Experts relevant to the NWRP preparation will be preferable. For carrying out the tasks, the consultant will appoint the national experts mentioned below:

Sl. No.	Designation of Professional	Number of Professional	Total Person-Month
(1)	(2)	(3)	(4)
1.	Team Leader (Water Resources Expert)	1	10
2.	Deputy Team Leader (Water Resources Planner)	1	10
3.	Sociologist (People's Participation)	1	8
4.	Hydrologist	1	8
5.	Geologist	1	8
6.	Economist	1	8
7.	Groundwater Modeler	1	6
8.	Surface water Modeler	1	6
9.	Policy Analyst	1	6
10.	Institutional Expert	1	8
11.	Environmentalist	1	8
12.	Fisheries Expert	1	6
13.	Agronomist	1	6
14.	Software Engineer	1	8
15.	Water Resources Engineer (GW)	1	8
16.	Water Resources Engineer (SW)	1	8
17.	Database Expert	1	8
18.	River Morphologist	1	6
19.	GIS Expert/ Report Editor	1	8
20.	Junior Consultant <ul style="list-style-type: none"> • Civil Engineer • Water Resources Project Planner • Hydro-geologist • Geography • Environment Engineer 	5	20
Total =		24	164

7. Qualification and Responsibilities of the Personnel

The required educational qualification, experience for the consultants with brief description of their tasks and responsibilities are described in **Annexure-II**.

8. Duration of the Contract

The national consultants (firm) will be liable to deliver the tasks and deliverables within December 2022.

9. Major Deliverables

The national consultants will submit the following deliverables:

- National Water Resources Plan(to the Year 2050).
- Development Results Framework (DRF) for NWRP
- Supporting Studies documents
- Scenario report on sectoral use of water resources (present and future scenarios)
- NWRP Investment Portfolio with program/project detailing
- NWRP Monitoring Tool

alu

10. Reporting Requirement

In addition to the above Reports, the following reports are required time to time:

Sl. No.	Report	Tentative Deadline	Copies
1.	Draft of Inception Report	October 2022	25 Copies
	Inception Report	November 2021	30 Copies
2.	Draft of Interim Report	February 2022	25 Copies
	Interim Report	March 2022	30 Copies
3.	Draft of Final Report	November 2022	30 Copies
	Final Report	December 2022	50 Copies

11. Workshop/Seminar

The consultant team will hold an inception workshop in consultation with PD, with participants from the public and private sectors as well as civil society, at the end of the second months of the start of the consultancy service. In this inception workshop, the study findings will be presented like best practices and methodologies on NWRP in Bangladesh and abroad from the public and private sectors. The participants will provide ideas and feedback for preparation of national water resources plan (NWRP). It is planned to hold multi-stakeholder workshop on different sectors relating to water resources by Capacity/ Awareness Building/ Dissemination/ Validation (08 nos.) workshops. The workshop will be held on different locations of the country especially on the divisional areas. At this stage, the consultant team will hold an interim workshop in consultation with PD at the end of 10 months of the start of the consultancy service by acquiring the results of the validation on NWRP workshop of different region. After completion of the Capacity/ Awareness Building/ Dissemination/ Validation (08 nos.) workshops and interim workshop, the consultants team will integrate the comments and verification of the NWRP. Further, this workshop functions as a consultation for the Ministry of Water Resources, the consultants team will prepare the draft final report and the required deliverables. The final dissemination workshop shall take place after completion of the final report.

Sl. No.	Overview of planned workshops/ stakeholder consultations
1.	Inception Workshop (Stakeholder Consultation)
2.	Awareness Building/ Dissemination/ Validation workshops- divisional level- 8 nos.
3.	Interim workshop after acquiring the results of the validation on NWRP workshop of different region
4.	Final Dissemination Workshop

* Workshop/seminar costing (of the above mentioned) will bear from WARPO/ NWRP project development budget head.

12. Mode of Payment

All payment of the national consultants will be made through satisfactory completion of the work. Initially after approval of the Inception Report with required deliverables, national consultants may claim for 20% payment of of the total contract amount. After successful submission of Interim Report with required deliverables, the national consultants may claim for 30% payment of the total contract amount. After submitting the Draft Final Report with required deliverables, the national consultants may claim for 30% payment of the total contract amount. The rest 20% of the contract amount of the national consultants will be made only after successful completion of the tasks and submission of the Final Report with required deliverables and approval by the Director General of WARPO or competent authority. As per government rules VAT, IT and other fees will be deducted from all payment.

alw

13. Duties and Responsibilities

13.1 WARPO's Responsibilities:

The consultants shall work under the direct supervision of the Project Director (PD) of WARPO. The Deputy Project Director (DPD) and specialised professionals of WARPO shall assist the PD as required for the tasks. For field survey and field data collection work, WARPO professionals will assist the consultants administratively. The Project Director will ensure that the objectives of the study as detailed in the To Rare achieved within the contract period. He will supervise the study process and execution of the tasks and monitor progress of the assigned tasks of the consultants according to the said objectives.

The consultant will have regular meetings with PD and the project team to discuss on technical and management issues related to the assigned tasks. PD will arrange relevant data (which are available in WARPO) to the consultants following WARPO's 'Data Dissemination Policy'.

WARPO will be responsible for arranging the following facilities to the consultants:

- Hydrological, hydro-geological, meteorological and relevant other which are available in WARPO for free of cost.
- Satellite images and previous reports available in WARPO.
- Provide administrative assistance for collection of data from other agencies.
- Provide information from other study components, which are available in WARPO.

13.2 Consultant's Responsibilities

The consultant shall carry out the service tasks as detailed out in this ToR, "Scope of Works" and "Responsibilities" of national consultants in the best interest of WARPO and the government with reasonable care, skill and diligence with sound engineering, planning, administrative and financial practices and shall be responsible to WARPO for discharge of responsibilities.

The Team Leader along with other consultants will be responsible to the Project Director for timely and properly execution of all the assigned tasks mentioned in the document.

- Make necessary arrangements for site investigations and data collection as needed for the study;
- Provide support staff including administrative and financial staff needed for the effective delivery of the consultancy services;
- Take care of operation and maintenance of the office including provision and operation of transport vehicles, office equipment, stationery, printing, reproduction and utilized;
- Bear the cost of relevant data and maps from other agencies and discussion with WARPO to avoid any duplication of data collection;
- Any vehicles, computers, printers, plotters, photocopiers, books, reports, periodicals or other major equipment purchased under the contract and used by the consultants shall be delivered to the office of the Project director, WARPO at the end of the contract period and before the submission of final bill;
- Handing over the collected data, images, maps study results and others as soft and hard copy to WARPO for their use and records;
- Arrange both theoretical and on the job training for WARPO professionals as a matter of technology transfer; and Attend in seminar/ workshop/ conference or any capacity development program arranged by WARPO
- Prepare the reports as specified in this ToR and also any other special report required by WARPO; and assistance in availing logistic support during field visit;
- Comply Panel of Experts' suggestion and recommendations as per direction of PD;

alu

Tentative Wrok Plan/ Tasks Schedule

Sl. No.	Description of Major Tasks	Year 1 (Jul 21-Jun 22)				Year 2 (Jul 22- Dec 22)	
		Q1	Q2	Q3	Q4	Q1	Q2
1.	Inception Report						
2.	Interim Report						
3.	Institutional Development						
4.	Database Development						
5.	Training						
6.	Workshop (Dissemination & validation)						
7.	Development Results Framework (DRF) for NWRP						
8.	Supporting Studies and Scenarios report						
9.	NWRP Investment Portfolio						
10.	National Water Resources Plan (NWRP) to the Year 2050						
11.	NWRP Monitoring Tool						
12.	Final Report						

JK

alu

h

Chand

Required Qualifications, Experiences and Responsibilities of the National Consultants

Sl. No.	Professional	Educational Qualifications	Experiences	Responsibilities
1.	Team Leader (Water Resources Expert)	He/ She should have at least a Bachelor degree preferably Master degree or equivalent in Hydrogeology/ Water Resources or Hydraulic Engineering/ Civil Engineering/ Hydro informatics from a well reputed university.	He/she must have a minimum 20 years of experience in the water resources relevant field and working experience in the management of national/international multi-disciplinary team and have working experience in a country similar to Bangladesh's land and water regime. He/ she must have a working experience in Bangladesh or similar geographical areas as Project Manager/ Team Leader or Deputy Team Leader/ Co-Team Leader in multi-national river basin water resources project planning.	<p>His/her tasks and responsibilities shall include but not be limited to the following:</p> <ol style="list-style-type: none"> Provide advice and direction to the multidisciplinary consultancy team and guidance and co-ordination of all consultancy and relevant project activities; Study and analyze NWPo 1999, NWMP, BDP2100 and its implementation, other previous water resources development studies and identify strength and weakness of the existing NWMP. So as to suggest guidelines for updating NWMP and hence preparation of NWRP; Advise, assess and analyze the model results for resource assessment and impact assessment for various water resources development alternatives and investments; Prepare project plan, schedules and time frame for publications of different reports; Any activity assigned by the Project Director for the interest of the project; Maintain liaison with the executive agency and relevant other agencies as per direction of PD; Arrange and supervise the relevant activities described in the project Log-frame; He will be administratively responsible for supervise the other member of the consultancy team and he will co-ordinate and supervise all the tasks of the team; He/she will be directly responsible to PD;





Sl. No.	Professional	Educational Qualifications	Experiences	Responsibilities
(1)	(2)	(3)	(4)	(5)
2.	Deputy Team Leader (Water Resources planner)	He/ She should have at least a Bachelor degree preferably Master degree or equivalent in Hydrogeology/ Water Resources or Hydraulic Engineering/Civil Engineering/ Hydro informatics from a well reputed university.	He/she must have more than 15 years of experience in the assessment and management of surface and groundwater resources using numerical models. He/she must have a working experience in Bangladesh or similar geographical areas and have wide experience as Deputy Project Manager/ Deputy Team Leader in multi-national river basin projects.	<p>x) He/she will work jointly with Deputy Team Leader & others and share the day to day responsibility for managing the professional services of all consultants, preparation of reports;</p> <p>xi) Maintain close contact with the Project Director and the Deputy Project Director (DPD) for briefing his/her output;</p> <p>xii) Participate in the Workshop and attend meetings as and when required;</p> <p>xiii) He/she will be responsible for preparing Investment Portfolio Program/ Project, Institutional Coordination Plan, Scenario reports, Water Export Report, Water Salinity Report, Water Resources Assessment Report;</p> <p>xiv) He/she will be responsible to prepare Basin wise plan, Water Uses and Allocation Plan and for preparation of Development Result Framework (DRF), Monitoring Tools;</p> <p>xv) Any other assignment requested by Project Director;</p> <p>His/her tasks and responsibilities shall include but not be limited to the following:</p> <p>i) Guide and co-ordinate of consultancy activities of the project;</p> <p>ii) Full responsibility for all aspects of planning, liaison and reporting;</p> <p>iii) Arrange and supervise the relevant activities described in the project Log-frame;</p> <p>iv) Study and analyze previous water resources development studies, regional and supporting studies and identify the strengths and weakness of NWMIP so as to prepare NWRP;</p> <p>v) Co-ordinate and supervise the work of other members of the consultant team;</p> <p>vi) Orient the work plan and necessary training program described in the ToR in consultation with PD so as to ensure maximum technology transfer and develop usable capability for NWRP preparation;</p> <p>vii) Preparation of different report to a standard acceptable by WARPO,</p>

alu





Sl. No.	Professional	Educational Qualifications	Experiences	Responsibilities
(1)	(2)	(3)	(4)	(5)
3.	Sociologist (People's Participation)	He/ She should have at least a Master degree in Sociology/ Economics/Geography or a related discipline from a well reputed university.	He/ She should have minimum of 15 years of experience in the field of community development or relevant activities. Candidate having Doctoral degree will be preferred. Experience of working in multidisciplinary EIA/SIA team in an interdisciplinary manner would be a advantage.	<p>MoWR and relevant other ministries and agencies.</p> <p>iii) Any activity assigned by the Project Director/ Team Leader for the interest of the project;</p> <p>ix) Maintain close contact with the Project Director and the Deputy Project Director for briefing his/her output;</p> <p>x) Participate in the Workshop and attend meetings as and when required;</p> <p>xi) He/she will be responsible for preparing Investment Portfolio Program/ Project, Institutional Coordination Plan, Water Resources related scenario reports, Water Export Report, Salinity Report, Water Resources Assessment Report;</p> <p>xii) He/she will be responsible to prepare Basin wise plan, Water Uses and Allocation Plan and for preparation of Development Result Framework (DRF), Monitoring Tools;</p> <p>xiii) Any other assignment requested by PD or Team leader;</p> <p>His/her tasks and responsibilities shall include but not be limited to the followings:</p> <p>i) Lead and conduct the social assessment with his team appropriate for national water resources planning exercise and assist for developing a work plan;</p> <p>ii) Ensuring that the technical quality of the team's work and is sufficiently comprehensive to accurately describe and measure the social impact of likely plans and projects formulated under the NWRP with and without project;</p> <p>iii) Conduct social assessment ensuring equitable account of the views of different socio-economic groups affected;</p> <p>iv) Advising and specifying the development of national socio-economic databases for NWRP;</p> <p>v) Advising on training needs, developing training plans, and developing</p>

alu







Sl. No.	Professional	Educational Qualifications	Experiences	Responsibilities
(1)	(2)	(3)	(4)	(5)
4.	Hydrologist	He/ She should have at least a Bachelor preferably Master Degree or equivalent in Hydrology/Hydrogeology/Geology/ Water Resources/ Hydraulic Engineering or a related discipline from a well reputed university.	He/ She should have minimum 12 years of experience in the assessment and management of surface water resources using surface water models. He/ She should have past experience in the management of multi-disciplinary team and should have an experience on surface water modeling.	<p>means to fully integrate social assessment in WARPO's day to day work and criteria to monitor this integration.</p> <p>vi) He/she will be responsible to assist for preparing Investment Portfolio Program/ Project, Institutional Coordination Plan, water resources scenario reports, water resources assessment report;</p> <p>vii) He/she will be responsible to assist for preparing basin wise plan, water uses and Allocation Plan and for preparation of Development Result Framework (DRF), Monitoring Tools;</p> <p>viii) Any other assignment requested by PD or Team leader;</p> <p>His/her tasks and responsibilities shall include but not be limited to the followings:</p> <p>i) Update the surface water models and assess surface water recharge and potential from local to planning areas;</p> <p>ii) Identify the possible surface water resources, water quality, suitable methods and environmental impacts under future climate change scenarios;</p> <p>iii) Assess present and future use of surface water for domestic, agricultural and industrial purpose in view of climate change;</p> <p>iv) Evaluate impacts of surface water withdrawal from river, impacts on drinking water supply, salt intrusion and determine appropriate mitigation measures;</p> <p>v) He/she will be responsible for Fresh water /Saline water interaction plan, surface water quality report, and determining available water resources.</p> <p>vi) He/she will be responsible to assist for preparing Investment Portfolio Program/ Project, Institutional Coordination Plan, Water Resources scenario Report, Water Export Report, Salinity Report, Water Resources Assessment Report;</p> <p>vii) He/she will be responsible to assist for preparing Basin wise plan, Water Uses and Allocation Plan and for preparation of Development</p>

anu

[Handwritten Signature]

[Handwritten Mark]

[Handwritten Signature]

Sl. No.	Professional	Educational Qualifications	Experiences	Responsibilities
(1)	(2)	(3)	(4)	(5)
5.	Geologist	He/ She should have at least a Bachelor degree preferably Master Degree or equivalent in Hydrogeology/Geology/ Water Resources or a related discipline from a well reputed university.	He/ She should have minimum 12 years of experience in the assessment and management of groundwater resources using groundwater models. He/ She should have past experience in the management of multi-disciplinary team and should have an experience on Groundwater modeling.	<p>Result Framework (DRF), Monitoring Tools; viii) Any other assignment requested by PD or Team leader;</p> <p>His/her tasks and responsibilities shall include but not be limited to the following:</p> <ul style="list-style-type: none"> i) Update the groundwater models and assess ground water recharge and potential from local to planning areas; ii) Identify the possible groundwater resources, water quality, suitable methods of abstraction and environmental impacts under future climate change scenarios; iii) Assess present and future use of groundwater for domestic, agricultural and industrial purpose in view of climate change; iv) Evaluate impacts of groundwater withdrawal on aquifer, river interaction, impacts on drinking water supply, salinity intrusion and determine appropriate mitigation measures; v) Rain Water Harvesting potential for GW recharge; vi) He/she will be responsible to assist for preparing Investment Portfolio Program/ Project, Institutional Coordination Plan, Water Resources scenario Report, Water Export Report, Salinity Report, Water Resources Assessment Report; vii) He/she will be responsible to assist for preparing Basin wise plan, Water Uses and Allocation Plan and for preparation of Development Result Framework (DRF), Monitoring Tools; viii) Any other assignment requested by PD or Team leader;
6.	Economist	He/ She should have at least a Master degree or equivalent in Economics or a related discipline	He/ She shall have minimum 12 years' experience in relevant field and shall manage the team undertaking economic evaluation and financial	<p>His/ Her tasks and responsibilities shall include but not be limited to the following:</p> <ul style="list-style-type: none"> i) Based on various technically feasible alternatives emerging from engineering, agronomic, social, environmental and institutional analysis and considering necessary time phasing and shadow pricing, identify all costs and benefits and formulate plan with the objective of

Handwritten signature

Handwritten signature

Handwritten signature

Handwritten signature

Sl. No.	Professional	Educational Qualifications	Experiences	Responsibilities
(1)	(2)	(3) from a well reputed university.	(4) analysis of the various alternate technically feasible National Water Resources Plans. He/ She should have significant experience and knowledge of the policy setting and economic appraisal of agricultural and water resources projects for irrigation, drainage, water supply, flood management and control. Working experience in South or East Asia and rice based agricultural systems would be preferable. A significant portion of this experience should include natural resource management, particularly in water resources-large water bodies, riverine systems, wetland management and related resources; and environmental appraisal and assessment including Initial Environmental Examination (IEE), Environmental Impact Assessment (EIA) in the	(5) maximizing net present value or other such planning objective. Calculate the internal rate of return and carry out sensitivity analysis due to variations in all critical factors affecting costs and benefits including environmental and social costs and benefits. Advise on the macro-economic implications of the various plans proposed and supervise macro-economic studies as needed; Take stock of resources on a spatial level for creating baselines on economic factors which relate to the Important Environmental Components (IECs); assess the economic consequences of environmental impacts resulting from projects implemented in the past (individual as well as cumulative); Perform economic analysis relevant to Environmental Impact Assessment (EIA) of specific proposed projects by utilizing standard economic evaluation techniques; He/she will be responsible for the analysis of water resources (environmental, ecology, socio-economic, political, institutional) perspective. Participate in developing National Water Resources Plan (NWRP) by suggesting optimal strategies of sustainable economic development. He/she will be responsible to assist for preparing Investment Portfolio Program/ Project, Institutional Coordination Plan, Water Resources scenario Report, Water Export Report, Salinity Report, Water Resources Assessment Report; He/she will be responsible to assist for preparing Basin wise plan, Water Uses and Allocation Plan and for preparation of Development Result Framework (DRF), Monitoring Tools; He/ She will be responsible to evaluate the programs on National Development in terms of GDP considering financial and economic analysis.

alu

Abul

Sl. No.	Professional	Educational Qualifications	Experiences	Responsibilities
(1)	(2)	(3)	(4)	(5)
			short and long run scenarios and policy recommendations in developing countries.	xii) Any other assignment requested by PD or Team leader;
7.	Groundwater Modeler	He/ She should have at least a Bachelor degree in Hydraulic/ Hydrological Engineering or any relevant field from a well-reputed university.	He/ She must have with overall experience of at least 10 years of experience in the field of Mathematical model. He/ She shall have a solid background in computational hydraulics and be a specialist in the use of hydrodynamic model software and interpretation of the model output in particular. Knowledge of MIKE-11, MIKE SHE, MOD FLOW & MIKE-21, GIS or equivalent software is preferable.	His/her tasks and responsibilities shall include but not be limited to the following: i) He/ She will be primarily responsible for developing mathematical models for the NWRP development scenarios and for impact assessment, ii) collect additional data for updating the existing regional and basin models; iii) Review the existing, on-going and proposed water resources projects and assess the cumulative impact on water resources system; iv) Review the water balances and update the water balances under revised boundary conditions; v) Review the salinity regimes / gradient in rivers of Bangladesh and interpret salinity data; and Miscellaneous task as and when required. vi) He/she will be responsible for the groundwater quality and quantity report and model preparation. vii) He/she will be responsible to assist for preparing Investment Portfolio Program/ Project, Institutional Coordination Plan, Water Resources scenario Report, Water Export Report, Salinity Report, Water Resources Assessment Report; viii) He/she will be responsible to assist for preparing Basin wise plan, Water Uses and Allocation Plan and for preparation of Development Result Framework (DRF), Monitoring Tools & update NWPo; ix) Any other assignment requested by PD or Team leader;
8.	Surface water Modeler	He/ She should have at least a Bachelor Degree in	He/ She must have with overall experience of at least 10 years of experience in the	His/her tasks and responsibilities shall include but not be limited to the following: i) He/ She will be primarily responsible for developing mathematical

Handwritten signature

Handwritten signature

Handwritten signature

Handwritten signature

Sl. No.	Professional	Educational Qualifications	Experiences	Responsibilities
(1)	(2)	(3)	(4)	(5)
		Hydraulic/Hydrological Engineering or any relevant field from a well-reputed university.	field of Mathematical Model. He/ She shall have a solid background in computational hydraulics and be a specialist in the use of hydrodynamic model software and interpretation of the model output in particular. Knowledge of MIKE-11, MIKE-21, GIS and equivalent software is preferable.	<p>models for the NWRP development scenarios and for impact assessment;</p> <p>ii) collect additional data for updating the existing regional and basin models;</p> <p>iii) Review the existing, on-going and proposed water resources projects and assess the cumulative impact on water resources system;</p> <p>iv) Review the water balances and update the water balances under revised boundary conditions;</p> <p>v) Review the salinity regimes / gradient in rivers of Bangladesh and interpret salinity data; and miscellaneous task as and when required.</p> <p>vi) He/she will be responsible for the surface water quality and quantity report preparation.</p> <p>vii) He/she will be responsible to assist for preparing Investment Portfolio Program/ Project, Institutional Coordination Plan, Water Resources scenario Report, Water Export Report, Salinity Report, Water Resources Assessment Report;</p> <p>viii) He/she will be responsible to assist for preparing Basin wise plan, Water Uses and Allocation Plan and for preparation of Development Result Framework (DRF), Monitoring Tools;</p> <p>ix) Any other assignment requested by PD or Team leader;</p>
9.	Policy Analyst	He/ She should have a Master degree in Sociology/ Political Science/ Economics/ Water Governance or a related discipline from a well-reputed	He/ She Should have professional experience of 15 years with rural communities preferably in Water Management Projects of which 5 years in the field of SIA. Doctoral degree in relevant field will be preferred. Familiarity	<p>His/her tasks and responsibilities shall include but not be limited to the followings:</p> <p>i) Defining scope of social assessment appropriate to NWRP;</p> <p>ii) Field data collection for identification of different views of socio-economic groups about the potential scenarios of NWRP;</p> <p>iii) Identification of future probable socio-economic impacts and social imbalance;</p> <p>iv) Advising on the development of socio-economic WARPO database for NWRP;</p>

aw

Sl. No.	Professional	Educational Qualifications	Experiences	Responsibilities
(1)	(2)	(3) university.	(4) with database and GIS application to social studies would be a great advantage.	(5) v) Assisting Team leader about training needs and identifying day to day social assessment that WARPO need to do for monitoring and integration with NWRP; vi) He/she will be responsible to assist for preparing Investment Portfolio Program/ Project, Institutional Coordination Plan, Water Resources scenario Report, Water Resources Assessment Report; vii) He/she will be responsible to assist for preparing Basin wise plan, Water Uses and Allocation Plan and for preparation of Development Result Framework (DRF), Monitoring Tools; viii) He/ She will be responsible for evaluate, reviews the existing policies and changing policy options. He will also be responsible for suggesting incorporation new policies, where found necessary. ix) Any other assignment requested by PD or Team leader;
10.	Institutional Expert	He/ She should have at least a Master degree in Sociology/ Economics/ Public Administration or a related discipline from a well-reputed university.	He/ She should have minimum of 15 years' experience in the evaluation of institutional functions and operations and training.	His/her tasks and responsibilities shall include but not be limited to the following: i) Identify the existing shortcomings of the agencies involved implementing the NWRP and develop institutional reform options for the Government in the water sector. ii) Develop a work plan to implement the water sector reform program within WARPO and develop an associated training; iii) Review the existing professional discipline mix in the WARPO and propose improvements to ensure a balanced multi-discipline approach to the planning and implementation of future programs and projects; iv) Review Organizational development plan (ODP) of WARPO and propose manpower requirement for monitoring NWRP, project evaluation and review, support to modernizing information and data section at WARPO, PCU for coastal zone and others; v) Review the role of different agencies in the implementation of NWRP and Bangladesh Water Act 2013 and propose how best to involve these

[Handwritten signature]

alw

[Handwritten signature]

[Handwritten mark]

Sl. No.	Professional	Educational Qualifications	Experiences	Responsibilities
(1)	(2)	(3)	(4)	(5)
11.	Environmentalist	He/ She should have at least a Bachelor degree preferably Master degree in Water Resources Engineering/ Environment science/ Geography/Ecology / Geology or a related discipline from a well reputed university.	He/ She should have minimum 12 years of experience as "Environmentalist" in Water resources planning, project preparation, monitoring & evaluation with at least 5 years' experience on reviewing of projects related with environmental issues. Higher degree and experience in national water resources planning process like NWMPP formulation will be preferable.	<p>institutions in the future program.</p> <p>He/she will be responsible for preparing Institutional coordination plan, short/medium/long term planning of water resources, present and future use of water resources, the analysis of water resources (environmental, ecology, socio-economic, political, institutional) perspective.</p> <p>He/she will be responsible to assist for preparing Investment Portfolio Program/ Project, Institutional Coordination Plan, Water Resources scenario Report, Water Resources Assessment Report;</p> <p>He/she will be responsible to assist for preparing Basin wise plan, Water Uses and Allocation Plan and for preparation of Development Result Framework (DRF), Monitoring Tools;</p> <p>ix) Any other assignment requested by PD or Team leader;</p> <p>His/her tasks and responsibilities shall include but not be limited to the followings:</p> <p>i) Assessing the environmental impacts of various water development options and ensure adoption of methodologies to include views of stakeholders;</p> <p>ii) Develop with the sociologists and economists, a mechanism for developing criteria to rank environmental and social assessments of water resources development activities in order to make recommendation to WARPO on sequencing and implementations of different development options;</p> <p>iii) Establish the linkage of EIA Review Process in Department of Environment (DoE) with those of 'Clearing House' at WARPO as per BWA for water sector projects;</p> <p>iv) Co-ordinate activities with DoE and organize and impart training to EIA practitioner.</p> <p>v) He/she will be responsible for preparing environmental flow</p>

9/6





Sl. No.	Professional	Educational Qualifications	Experiences	Responsibilities
(1)	(2)	(3)	(4)	(5)
12.	Fisheries Expert	He/ She should have at least a Bachelor degree preferably Master degree in biology, zoology or fishery science or any relevant field from a well reputed university.	He/ She should have a minimum 10 years of experience in the assessment and evaluation of floodplain fisheries resources and working experience in multi-disciplinary EIA team in an interdisciplinary manner. He/ She will have a thorough understanding of the Bangladesh fisheries ecosystem and will have demonstrated significant field experience in fisheries data acquisition, analysis and reporting.	management plan, aquatic environmental restoration plan, analysis of water resources (environmental, ecology, socio-economic, political, institutional) perspectives. vi) He/she will be responsible to assist for preparing Investment Portfolio Program/ Project, Institutional Coordination Plan, Water Resources scenario Report, Biodiversity Report, Water Resources Assessment Report; vii) He/she will be responsible to assist for preparing Basin wise plan, Water Uses and Allocation Plan and for preparation of Development Result Framework (DRF), Monitoring Tools; viii) Any other assignment requested by PD or Team leader; His/her tasks and responsibilities shall include but not be limited to the following: i) Prepare an inventory of the present fisheries situation and integrating all the past information together with those from DoE to determine inland fisheries potential as baseline info in NWRP; ii) Assess impact on the fisheries sector due to proposed water development options under the NWMP/NWRP and suggest proper mitigation measures, particularly for the open access floodplain fisheries; iii) Review the present activities of fisheries sector in different water development projects, particularly under the improved irrigation and drainage condition, to determine their future development potential (under climate change and upstream development beyond boundaries) and prepare optimum development plan with particular attention integrating to resource allocation, conservation and its social impact; iv) Examine in detail the existing and potential aquaculture facilities in Bangladesh and appropriately factor these into the NWRP planning

[Handwritten signature]

[Handwritten signature]

[Handwritten signature]

[Handwritten mark]

Sl. No.	Professional	Educational Qualifications	Experiences	Responsibilities
(1)	(2)	(3)	(4)	(5)
13.	Agronomist	He/She should have at least a Bachelor degree preferably Master degree in Agriculture/ Agronomy or any relevant field from a well reputed university.	He/She should have at least 10 years of relevant experience in agriculture related activities. He/ She should have practical experience in modeling monsoon cropping patterns, land use, and relate the pre and post-project conditions.	<p>scenarios.</p> <p>v) He/she will be responsible to assist for preparing Investment Portfolio Program/ Project, Institutional Coordination Plan, Water Resources scenario Report, Hlisha Migration Route, Biodiversity Report, Water Resources Assessment Report;</p> <p>vi) He/she will be responsible to assist for preparing Basin wise plan, Water Uses and Allocation Plan and for preparation of Development Result Framework (DRF), Monitoring Tools;</p> <p>vii) Any other assignment requested by PD or Team leader;</p> <p>His/her tasks and responsibilities shall include but not be limited to the followings:</p> <p>i) Establishing baseline condition in respect of land resources and agricultural practices in the country;</p> <p>ii) Data collection, analysis, preparation of cropping pattern and other program development in the field of agriculture duly considering available resources with especial context of climate change;</p> <p>iii) Prepare technically, socially, and environmentally viable production plans for cropping under irrigated and rain-fed condition fully taking into account the range of technology and management available;</p> <p>iv) Advise on appropriate agronomic methods and techniques to enable crop diversification for water conservation, and effective water management;</p> <p>v) Identify agribusiness opportunities and develop farm models to test alternatives for inclusion in the NWRP;</p> <p>vi) Identify crop suitability in irrigated, rain-fed and seasonally flooded areas and develop realistic future cropping patterns aimed at optimizing crop production and yield;</p> <p>vii) Work with the relevant section of WARPO to devise strategies to minimize or mitigate the adverse environmental impact of fertilizers and</p>

a/w

[Handwritten Signature]

[Handwritten Signature]

[Handwritten Signature]

Sl. No.	Professional	Educational Qualifications	Experiences	Responsibilities
(1)	(2)	(3)	(4)	(5)
14.	Software Engineer	He/ She should have at least a Bachelor degree or equivalent in Computer Science, Computer Science and Engineering, Software Engineering or any relevant field from a well reputed university.	He/ She must have with minimum 10 years' experience in the software preparation, different kinds of tools. He/ She should have past experience in the management of multi-disciplinary team and should have an experience on surface water/ groundwater models preparation for any water resources related govt. institute or WARPO and other monitoring tools preparation.	<p>pesticides for NWRP.</p> <p>viii) He/she will be responsible to assist for preparing Investment Portfolio Program/ Project, Institutional Coordination Plan, Water Resources scenario Report, Water Resources Assessment Report;</p> <p>ix) He/she will be responsible to assist for preparing Basin wise plan, Water Uses and Allocation Plan and for preparation of Development Result Framework (DRF), Monitoring Tools;</p> <p>x) Any other assignment requested by PD or Team leader;</p> <p>His/her tasks and responsibilities shall include but not be limited to the followings:</p> <p>i) Preparation of NWRP monitoring tools for WARPO;</p> <p>ii) Identify the possible groundwater/surface water tools used in globally, water quality/quantity tool, & suitable methods of water resources sector;</p> <p>iii) He/she will be responsible for both quality and quantity report preparation of groundwater and surface both;</p> <p>iv) He/she will coordinate with database expert for the preparation of NWRP.</p> <p>v) He/she will be responsible to assist for preparing Investment Portfolio Program/ Project, Institutional Coordination Plan, Water Resources scenario Report, Water Resources Assessment Report;</p> <p>vi) He/she will be responsible to assist for preparing Basin wise plan, Water Uses and Allocation Plan and for preparation of Development Result Framework (DRF), Monitoring Tools;</p> <p>vii) Any other assignment requested by PD or Team leader;</p>
15.	Water Resources Engineer (Ground Water)	He/ She should have at least a Bachelor degree or equivalent in Hydrogeology,	He/ She must have with minimum 10 years' experience in the assessment and management of groundwater	<p>His/her tasks and responsibilities shall include but not be limited to the followings:</p> <p>i) Update the groundwater models and assess ground water recharge and potential from local to planning areas;</p> <p>ii) Identify the possible groundwater resources, water quality, suitable</p>

dlw

[Handwritten Signature]

[Handwritten Mark]

[Handwritten Signature]

Sl. No.	Professional	Educational Qualifications	Experiences	Responsibilities
(1)	(2)	(3) Water Resources or Hydraulic Engineering or any relevant field from a well-reputed university.	(4) resources using groundwater models. He/ She should have past experience in the management of multi-disciplinary team and should have an experience on Groundwater models of WARPO or any water resources related govt. institute as well as MIKE-SHE	(5) methods of abstraction and environmental impacts under future climate change scenarios; iii) Assess present and future use of groundwater for domestic, agricultural and industrial purpose in view of climate change; iv) Evaluate impacts of groundwater withdrawal on aquifer river interaction, impacts on drinking water supply, salt intrusion and determine appropriate mitigation measures with reports; v) He/she will be responsible for both quality and quantity report preparation of groundwater and surface both; vi) He/she will be responsible to assist for preparing Investment Portfolio Program/ Project, Institutional Coordination Plan, Water Resources scenario Report, Water Export Report, Salinity Report, Water Resources Assessment Report; vii) He/she will be responsible to assist for preparing Basin wise plan, Water Uses and Allocation Plan and for preparation of Development Result Framework (DRF), Monitoring Tools; viii) Any other assignment requested by PD or Team leader;
16.	Water Resources Engineer (Surface Water)	He/ She should have at least a Bachelor Degree or Equivalent in Civil/ Water Resources Engineering or any relevant field from a well reputed university.	He/ She must have with 10 years' experience in the relevant field. He/ She should at least 8 years of experience in using mathematical model for surface water resources assessment in any water resources related govt. institute. Experience using water Balance Model of WARPO, MIKE II based	His/her tasks and responsibilities shall include but not be limited to the following: i) Responsible for surface water resources and flood damage assessment within the NWRP; ii) Responsible for modeling year round water resources into a fully consistent and nationally integrated model; iii) Responsible for determining a national water balance using appropriate computer model techniques, and for model the effects of different water use scenarios on national water resources; iv) Advise on, model and take account of impacts of surface water development on wetlands and salinity intrusion; v)

a/u

e

Sl. No.	Professional	Educational Qualifications	Experiences	Responsibilities
(1)	(2)	(3)	(4) regional models would be preferred.	(5) vi) Develop techniques and methodologies for flood plain zoning, flood hazard and damage assessment; vii) Review the approaches for flood management in view of climate change; viii) Develop water resources databases to support the NWRP and any other work they may be asked by Team leader; ix) He/she will be responsible for the surface water quality and quantity report preparation; x) He/she will be responsible to assist for preparing Investment Portfolio Program/ Project, Institutional Coordination Plan, Water Resources scenario Report, Water Export Report, Salinity Report, Water Resources Assessment Report; xi) He/she will be responsible to assist for preparing Basin wise plan, Water Uses and Allocation Plan and for preparation of Development Result Framework (DRF), Monitoring Tools; xii) Any other assignment requested by PD or Team leader;
17.	Database Expert	He/ She should have at least a Bachelor degree in Civil Engineering/ Computer Science/ Computer Science and Engineering or any relevant field from a well-reputed university.	He/ She should have minimum 10 years of experience in Design and O&M of Water resources database with at least 5 years field experience on O&M of water resources database. Experience in NWRD/ ICRD formulation or any water resources relevant databases of govt. institutes will be preferable.	His/her tasks and responsibilities shall include but not be limited to the followings: i) Provide suitable design criteria for all database preparation works proposed in the various NWRD/ICRD scenarios for the NWRP; ii) Provide detailed cost analyses and implementation schedules as required by the planning proposals; iii) Acquire and provide to planning teams updated inventories of the existing status and stock of water sector projects database; iv) He/she would be especially responsible for analysis & design of various water resources database for NWRP program; v) He/she will be responsible to assist for preparing Investment Portfolio Program/ Project, Institutional Coordination Plan, Water Resources scenario Report, Water Resources Assessment Report; vi) He/she will be responsible to assist for preparing Basin wise plan,

Handwritten signature/initials.

Handwritten mark or signature.

Handwritten signature/initials.

Handwritten signature/initials.

Sl. No.	Professional	Educational Qualifications	Experiences	Responsibilities
(1)	(2)	(3)	(4)	(5)
18.	River Morphologist	He/she shall have at least a Bachelor degree in Civil Engineering/ Water Resources Engineering or any relevant field from a well-reputed university.	He/ she should have at least 10 years of working experience of similar nature in national/ multi-national river basin development project.	<p>Water Uses and Allocation Plan and for preparation of Development Result Framework (DRF), Monitoring Tools;</p> <p>vii) Any other assignment requested by PD or Team leader;</p> <p>His/her tasks and responsibilities shall include but not be limited to the followings:</p> <ul style="list-style-type: none"> i) Review the past morphological studies and develop a conceptual understanding of future changes during the period of the plan period; ii) Develop and simulate sediment transport model and morphological model to predict future changes; iii) Analyzing and interpreting the model results; iv) Reviewing the bank protection and bank training projects and evaluate it performance; v) Prepare reports on interventions and projects to adapt and manage the changes on morphology; vi) He/she should assist Team Leader for study report preparation and any other assignment requested by PD or Team leader; vii) He/she will be responsible to assist for preparing Investment Portfolio Program/ Project, Institutional Coordination Plan, Water Resources scenario Report, Water Export Report, Salinity Report, Water Resources Assessment Report; viii) He/she will be responsible to assist for preparing Basin wise plan, Water Uses and Allocation Plan and for preparation of Development Result Framework (DRF), Monitoring Tools;
19.	GIS/ Data Management Expert	He/ She should have at least a Bachelor degree or equivalent degree in geography, geology,	He /She should have at least 8 years of experience in the field of GIS, in the investigation and management of earth resources such as rivers,	<p>His/ Her tasks and responsibilities shall include but not be limited to the followings:</p> <ul style="list-style-type: none"> i) Support problem solving and advise on innovative techniques relevant to water resources assessment and monitoring as well as outputs for the NWRP reports; ii) Development and production of GIS products and where appropriate

a/c

[Handwritten Signature]

[Handwritten Signature]

[Handwritten Signature]

Sl. No.	Professional	Educational Qualifications	Experiences	Responsibilities
(1)	(2)	(3)	(4)	(5)
		environmental sciences or civil engineering.	water bodies etc. Experience must demonstrate capability to handle all aspects of GIS in a support role for a team of specialists from engineering and science. Experience with ARC/INFO, Arc View and related software is required.	<p>devise management and marketing strategies to make the GIS unit self-sustaining;</p> <p>iii) He/ She will plan and design the analysis of different layers of spatial data and presentation of the results for better interpretations;</p> <p>iv) Deliver all collected/analyzed GIS data to NWRD;</p> <p>v) Implement and manage GIS projects and delivery of work products and any other assignment requested by PD or Team leader;</p> <p>vi) He/she will be responsible to assist for preparing Investment Portfolio Program/ Project, Institutional Coordination Plan, Water Resources scenario Report, Water Resources Assessment Report;</p> <p>vii) He/she will be responsible to assist for preparing Basin wise plan, Water Uses and Allocation Plan and for preparation of Development Result Framework (DRF), Monitoring Tools;</p>
20.	<p>Junior Consultant</p> <ul style="list-style-type: none"> • Civil Engineer • Water Resources Project Planner • Hydro-geologist • Geography Environment Engineer 	<p>He/ She should have at least Bachelor Degree in Civil Engineering/ Water Resources Engineering/ Geology/ Hydrology/ Geography and Environment Science or Engineering or equivalent discipline from a well-reputed University.</p>	<p>He/ She should have at least 5 (five) years of experience in relevant field.</p>	<p>His/ Her tasks and responsibilities shall include but not be limited to the following:</p> <ul style="list-style-type: none"> i) Survey data and field data collection; ii) Data management and analysis of basic data relating to Hydrogeology, Hydrology, Hydraulic, Water Resources etc.; iii) Any other assignment requested by PD or Team Leader. iv) He/she will be responsible to assist for preparing Investment Portfolio Program/ Project, Institutional Coordination Plan, Water Resources scenario Report, Water Resources Assessment Report; v) He/she will be responsible to assist for preparing Basin wise plan, Water Uses and Allocation Plan and for preparation of Development Result Framework (DRF), Monitoring Tools;

Arif Uddin

(Engr. Md. Arif Uddin)
 Assistant Project Director-1
 "Preparation of National Water Resources Plan" Project
 Water Resources Planning Organization
 Ministry of Water Resources

Hasan Shahrar

(Md. Hasan Shahrar)
 Deputy Project Director
 "Preparation of National Water Resources Plan" Project
 Water Resources Planning Organization
 Ministry of Water Resources

Md. Masud Alam

(Engr. Md. Masud Alam)
 Project Director
 "Preparation of National Water Resources Plan" Project
 Water Resources Planning Organization
 Ministry of Water Resources

Md. Masud Alam
 (সে. এম. মাসুদ আলম (আই. এম. এ.))
 প্রকল্প পরিচালক (কারিগরি)
 (উন্নয়ন বিভাগ)
 জাতীয় জল সম্পদ পরিকল্পনা সংস্থা

