

Government of West Bengal

West Bengal Major Irrigation and Flood Management Project
(WBMIFMP)

Terms of Reference (TOR)
for
Project Management Consultant (PMC)

IRRIGATION & WATERWAYS DIRECTORATE

WEST BENGAL MAJOR IRRIGATION AND FLOOD MANAGEMENT PROJECT (WBMIFMP)

Terms of Reference for Project Management Consultant

AA. Background

1. The Government of India applied for USD 290 million financing from the International Bank for Reconstruction and Development (IBRD) towards the cost of the **West Bengal Major Irrigation and Flood Management Project (WBMIFMP)** and intending to apply a part of the proceeds for Consultancy Services. The sub – borrower is Irrigation & Waterways Department, Government of West Bengal
2. WBMIFMP aims to improve the existing irrigation network in the Damodar Valley Command Area (DVCA) within the State of West Bengal, to optimize conjunctive and sustainable use of ground and surface water across the DVCA in different irrigation seasons, and to reduce flooding in the Lower Damodar Sub-Basin (LDSB) in West Bengal.
3. The duration of the project as envisaged now is for 5(five) years. The Project will be executed by the Irrigation and Waterways Department (IWD) of the Government of West Bengal (GoWB) located at Kolkata and the Project Management Unit(PMU) is the implementing agency / employer (SPMU, IWD). The support of the Project Management Consultant (PMC) will be at the PMU at various levels viz the State Project Management Unit(SPMU), the District Project Management Units(DPMUs) and the District Project Implementation Units(DPIUs) and is expected to fully compliment the PMU in the execution of the Project in all aspects under overall control of the IWD at the PMU. The Consultant may note that the execution of the Project will be decentralized with District Units of IWD and the support will extend to the field units as well.

BB. Overview of the Project

4. The Damodar River originates from the Chhotonagpur Plateau at Latehar District in Jharkhand and flows through the districts of Latehar, Hazaribagh in Jharkhand and enters Purulia District in West Bengal which is the lowermost riparian State in Damodar Basin. Five reservoirs have been built on the Damodar and its tributaries in Jharkhand to moderate floods in the lower basin area in West Bengal and for irrigation. These are operated by Damodar Valley Corporation (DVC). The Damodar river bifurcates into two main branches, i.e. Mundeswari and Lower Damodar (Amta Channel) near the border of Burdwan and Hooghly Districts, and both the channels traverse through the districts of Hooghly and Howrah, and ultimately meet River Hooghly, which debouches into Bay of Bengal.

4.1 **Project Area:**

The project area considering both irrigation and flood management aspects is as follows:

4.2 **Irrigation:**

- 4.2.1 Northern Boundary: River Ajoy at Parulia, Block Katwa-I, District Burdwan (Latitude 233851 N).
- 4.2.2 Southern Boundary: Outfall of Nabinbabur Khal at Block Amta-I, District Howrah (Latitude 223547 N).
- 4.2.3 Western Boundary: Durgapur Barrage on river Damodar at Block Barjora, District Bankura (Longitude 871813 E).
- 4.2.4 Eastern Boundary: Howrah Burdwan Main Line of Eastern Railway at Nityanandapur, Block Balagarh, District Hooghly (Longitude 882517 E)

4.3 **Flood management:**

- 4.3.1 Northern Boundary: Bifurcation point of river Damodar into Mundeswari River and

- Amta Channel at Beguahana, Block Jamalpur, District Burdwan (Latitude 23088.34 N).
- 4.3.2 Southern Boundary: Outfall of Amta Channel in river Hooghly, Block Shyampur-I, District Howrah (Latitude 222059.76 N).
- 4.3.3 Western Boundary: Ichhapur at Block Khanakul-I, District Hooghly (Longitude 87450.43 E).
- 4.3.4 Eastern Boundary: River Saraswati at Eklakhi, Block Chanditala-II, District Hooghly (Longitude 881633.89 E).

- 4.4 The schematic drawing, brief project outlay, location and other particulars are available on the website www.wbiwd.gov.in in the link “WBMIFMP”.

CC. Project Components

- 5.1 The irrigation network downstream of the Durgapur Barrage (West Bengal) was developed more than 6 decades ago and is now degraded. This system is managed by IWD of GoWB. Dilapidated hydraulic infrastructure, loss of irrigation water due to seepage and silted distribution networks have reduced the system’s efficiency and led to water scarcity, particularly at the tail reaches. As a result, the gap between irrigation potential created vis-à-vis utilized is increasing, despite adequate water availability (around 140,000 hectare-meter (ha-m) for 332,000 hectare (ha) of command area under Kharif irrigation on an average). This is only 20% of the total water availability at the barrage during monsoon. Tail end farmers are compelled to abstract groundwater, which increases the costs of cultivation. This trend increases when rainfall is erratic or insufficient.
- 5.2 There is an urgent need to enhance the reliability and efficiency of water supply to increase water productivity and crop production, and to increase the amount of water that reaches tail-end areas. In response to these challenges, the West Bengal Major Irrigation and Flood Management Project (WBMIFMP) has been conceived. It aims to (i) ensure that water is distributed more equitably across the project command area, (ii) use of reduced water from the reservoirs during Kharif for Rabi irrigation and (iii) reduce flooding as much as can feasibly be achieved. A suitable system for real-time operation and monitoring of the irrigation management system, and private sector participation in operation and maintenance are being explored.
- 5.3 The project is preliminarily structured under the following Components:
- 5.3.1 Component A: Irrigation Management - The component includes the following subcomponents: (i) Establishment of MIS, (ii) Improving the Quality of Service Delivery, (iii) Aquifer Management, and (iv) Capacity Strengthening.
- 5.3.2 Component B: Modernization of Irrigation Infrastructure - This component will invest in the modernization of irrigation infrastructure of the main (level 1), branch (level 2), distributary (level 3), and minor and sub-minor canals (level 4). Structural interventions on the canals include: desilting and reforming (restore shape and bank height) of selected canal sections across all canal levels; canal lining of unstable canal sections to ensure renewed canal section stability and hydraulic capacity; rehabilitating existing damaged flow control structures to restore and/or improve function, including measures to address foundation scour, structural degradation and mechanical wear; improved irrigation management by real time flow data collection through sensors and mobile app to serve as inputs in the decision support system and to perform need-based operation to ensure need based and equitable distribution of canal water at the entry point of chaks; improving of outlet structures (fully closeable and lockable), further ensure need-based supply and to avoid water wastage; and improving weirs and drop structures and arrangement of tail regulation as needed to maintain operational head in canals;

sub-surface pressurized pipe systems that will deliver water to faucets on each plot; and cross regulator construction.

- 5.3.3 Component C: Flood management - This Component will invest in structural measures to reduce flooding in the Project area. Structural measures will include investments to ensure that the flood flow discharge is more evenly shared between the Mundeswari and Amta Channel. Increasing flood discharge capacity in Mundeswari requires dredging to restore/increase the low flow to moderate flood discharge capacity to reduce/limit peak discharge that will be shared in the Amta for all flood events.
- 5.3.4 Component D: Project Management - This component will strengthen capacity of the Project Management Unit set up for management of the project, monitoring and evaluation (M&E) (including, inter alia, the areas of procurement and financial management) through the provision of inventories, consultant services, training, and financing of incremental operating costs. Intermediate results indicators include the number of Project monitoring reports submitted on time annually. This component will (i) finance the preparation of several technical studies.

DD. Objectives of engagement of Project Management Consultant

- 6.1 The objective of this consultancy is to efficiently manage the project through assistance to SPMU, DPMUs and DPIUs such that envisaged activities of the project are completed within agreed timelines, within budgeted costs and in full compliance with the Financing Agreement of the Project with the World Bank and in adherence to all applicable safeguard policies, including the Environmental and Social Impact Assessment (ESIA), Environmental and Social Management Plan (ESMP) and Resettlement Action Plan (RAP), Acts, Rules and Regulations. The objective is also to achieve agreed-upon project monitoring indicators within the stipulated time frame.

The brief Summary of the Scope of Services at various phases is presented below.

EE. Project Implementation Arrangements

- 7.1 The Client has engaged other consultants to carry out feasibility study, detail design and preparation of the bidding documents and also for ESIA study for award of contracts associated with 30 % of the total investment. The PMC consultant will manage execution of these contracts which will be assigned by the client. The Scope of Services for PMC includes development of Management & Web-GIS based Water Resource Information System (WRIS), preparation of bidding documents, procurement support, and execution of contracts of balanced 70 % of the total investment for the project as well.
- 7.2 Project Implementation Arrangement within the Govt. of West Bengal:
- 7.2.1 At the State level, a Technical Steering Committee (SLTSC) headed by the Chief Secretary has been established and consists of the Heads of all concerned Departments. The SLTSC will review preparation and implementation progress, coordinate between Departments and provide guidance on policy matters
- 7.2.2 IWD Govt. of WB is responsible for project implementation. It has set up a State Project Management Unit (SPMU) headed by a Project Director (PD) / Chief Engineer of the IWD. The PD is supported by two Additional PDs / Superintending Engineer (SEs), 4 Deputy PDs / Executive Engineers (EEs), Accounts Officials and other support staff. Nodal officers from the Agriculture, Agri-Marketing, Fisheries, Horticulture & Food Processing Industries and Water Resources Investigation and Development Department (WRIDD) are members (Partner Departments) of the SPMU. At the district level, two District Project Management Units (DPMUs) have been established (one for Howrah and Hooghly, and one for Bankura and Burdwan) for coordination and monitoring which are

headed by Additional Project Directors. The DPMUs are functional with a skeleton staffing structure. Other implementing departments will also be represented in the DPMUs by concerned district level officials. During project implementation, project components and sub-components execution will be overseen by the District Project Implementation Units (DPIUs) headed by the Deputy Project Directors/Executive Engineers in case of IWD and by other appropriate district level officers of partner departments. While the DPIUs of IWD will be full-time dedicated staff, such DPIUs of other Departments will implement project components in addition to their own duties.

- 7.3 The SPMU will recruit specialized Project Management Consultant's (PMC) Services. This will include providing expert professionals who will work at the SPMU/DPMUs/DPIUs office for extending hand holding support in overseeing design, construction and contract Management, prepare progress reports and update procurement plans, project planning asset management (with GIS tagging), annual expenditure planning, budgeting, financing forecast and plans, monthly and quarterly annual reports and work programming, preparation of documentation and recording of discussion of the meetings as required by the Client and the World Bank among others. While the staffing pattern of the PMC will be primarily suggested by the Client, suitable reorientation / reorganization may be required during the project implementation period, for effectively managing the project, which will be decided in due course of time.

FF. Scope of Services

- 8.1 The PMC shall assist the Client in the preparation and implementation of the Project, including construction supervision, procurement and contract management. The Project will launch 8 civil works packages during the initial stage of investment in the first 18th months (30% of the project investment) and approximately 15 numbers packages of Civil works and 5 numbers packages for procurement of goods along with approximately 5 numbers of consultancy services for the later stage of investment (70% of the project investment).
- 8.1.1 The PMC shall be responsible for regular reporting of physical & financial progress through MIS to the Employer, shall maintain Web-GIS based WRIS for the project and will bring all the events, disputes or issues, which might affect the performance of works contracts, before the client forthwith. Any decision on Price variation, compensation event, deviation from the prescribed specifications and layout of works, pertaining to the contracts should not be communicated to the works contractors by the PMC without consulting with and obtaining prior approval of the Employer.
- 8.2 Phase I: Project Inception: Commencement of Work**
- 8.2.1 The Consultant will have discussions with the key stakeholders at IWD, GoWB to understand implementation status for each package, basis for site selection, the various manuals and guidelines prepared for the project, specific concerns of (if any) and the nature and frequency of various field tests to be performed on civil works and reporting arrangements. The Consultant will acquire sufficient understanding of documents and information related to works to enable him to undertake review of related design and contract documentation for the already tendered (30% of the project investment works) including the nature and scope of work and the prevailing site conditions, documents delivered and associated with the works as submitted already to the Client by the FS Consultant for the works related design, bidding documents etc. as prepared for 30% of the total project investment. The consultant shall also assist the IWD in Risk Management Planning and conduct a risk identification and planning workshop.
- 8.2.2 The consultant will undertake the following preparation activities:
- 8.2.2.1 Facilitate kick-off meeting between the Contractor and Client to discuss and

- finalize Contractor's work program, review & recommend for Client's approval L2 level PERT Chart prepared by the Contractor.
- 8.2.2.2 Review and approve Contractor's Quality Assurance Plans.
 - 8.2.2.3 Review and approve Contractor's ESHS Plan
 - 8.2.2.4 Prepare a monitoring and reporting scheme, in consultation with the Client, including physical, financial and EHS aspects, and finalize formats for reporting progress. The PMC shall also support the Client in finalizing a Project Communication Protocol to layout communication protocols and roles and responsibilities of Client, Contractor and PMC required for successful implementation.
 - 8.2.2.5 Review the licenses, insurance policies /certificates and other documents required to be submitted by the Contractor in line with contract provisions and statutory requirements.
 - 8.2.2.6 Review and recommend for Client's approval the sub-contractors/vendors proposed by Contractors.
 - 8.2.2.7 Finalize site documentation formats like Material at Site, Encumbrance Register etc. to be maintained by the Contractor, PMC and Client.
 - 8.2.2.8 All reports and documents relevant to the services, field notes, computer programs etc. shall become the property of Client after completion of the assignment.
 - 8.2.2.9 The PMC will also collect/capture data relating to the PDO Indicators as well as Intermediate Results Indicators as agreed with World Bank and present those to the M&E Consultant to be engaged separately by the Client.
- 8.2.3 After the initial study and discussions, the Consultant will prepare and submit a Project Inception Report, within 30 days of issue of work order. The Inception report would include items like:
- 8.2.3.1 Comprehensive list of activities, without gaps or overlaps and assess adequacy of detailing of work breakdown structure (WBS) to allow effective monitoring
 - 8.2.3.2 A Risk Register for inclusion in Contracts with allocated responsibilities to parties as part of a Risk management plan and matrix with defined timelines
 - 8.2.3.3 Develop and finalize an integrated master L1-L6¹ schedule (baseline schedule) by integrating all contractors' schedules with timelines for Govt. obligations, preparing a master milestone plan based on the Master L2 baseline schedule. This must allow for efficient activity sequencing and limit rework, be inclusive of constraints and interdependencies, based on a critical path.
 - 8.2.3.4 Facilitate the IWD in preparing a schedule change management framework for managing any changes to baseline schedule.
 - 8.2.3.5 Assist in analyzing overall project baseline budget and prepare cash flow plan based on baseline schedule (after the commercial terms with the main contractor are finalized for all scope areas).
 - 8.2.3.6 Detailed methodology for execution of the audit, including the various tests that will be conducted and outlining quality audit procedures.
 - 8.2.3.7 Detailed methodology for checking compliance to Environment and Social

¹LEVEL 1 : Project Management overview schedule/programme or Project Master Schedule.

LEVEL 2 : Area or Process/Utility Unit schedule/programme, by Project Phase by Area or Unit or Summary Master Schedule.

LEVEL 3 : Discipline schedule/programme, by Project Phase by Area/Unit by Single or Multi-disciplines or Project Co-ordination Schedule.

LEVEL 4 : Main Activities schedule/programme, or Executive Schedule by Project Phase by Area/Unit by Single or Multi-disciplines by Main Activities.

LEVEL 5 : Detail Activities schedule/programme or Detailed Schedule, by Project Phase by Area/Unit by Single or Multi-disciplines by Detail Activities.

LEVEL 6 : Micro-detail Activities schedule/programme.

- Management Framework (ESMF) including the EMPs and applicable laws pertaining to environment protection and labor welfare.
- 8.2.3.8 Audit plan for the first year clearly identifying the audit stage for each type of work.
 - 8.2.3.9 Overall team deployment schedule
 - 8.2.3.10 Reporting formats including schedule of reporting and verification of compliance to observations.
 - 8.2.3.11 Reporting and escalation protocols including methodology for integrating the audit results in payment certification system.
 - 8.2.3.12 Evaluation of the project MIS and suggesting updating requirements for capturing the audit reports, compliance and linking with payment certification system with assistance of MIS Specialist deployed by the IWD.
 - 8.2.3.13 The consultant shall assist the IWD in modifying designs and specifications, work method statement, proposals for cash flow statement, construction schedule, etc for each works contract package are appropriately modified and supplemented where the submitted designs have been found to be deficient for the above mentioned initial 30% of the total project investment.
- 8.2.4 The Consultant shall prepare Detailed Engineering Designs and working drawings, method statements, specifications, activity, construction and plant and equipment schedules, and NCB bidding documents and Bid Evaluation Reports for the remaining 70 percent of the project activities (i.e. balance of the design /drawing prepared by the FS Consultant), and for 1 pressurized irrigation pilots. The approval/vetting of the designs, as prepared by the Consultant , will be given by the Central Design Office (CDO) of the IWD under the overall direction of the Project Director(PD)
- 8.2.5 The Consultant will be designated as the Engineer or Engineer-in-charge or Project Manager (All having the same meaning and connotation in the perspective of the contract agreement; accordingly wherever ‘Project Manager’ is used , it also covers ‘Engineer’/‘Engineer-in-Charge’ and vice-versa) in the construction contracts and will carry out responsibilities of Contract Management in accordance with and to the extent of delegation of power, as may be specified in the contracts.
- 8.2.6 Develop, launch/install, operationalize, maintain and update the Management Information System (MIS) as well as Web-GIS based WRIS as per Feasibility Study Report (FSR) for the Project and establish linkages with the existing Mobile app, already developed, for irrigation monitoring and also with the Integrated Financial Management System of the State Finance Department (to the extent permissible).

8.3 Phase II: **Project Implementation.**

- 8.3.1 The PMC shall monitor the progress of works as per the finalized L-2 schedule, certify the achievement of contractual milestones (as applicable) defined and keep Contractor/Client advised about possible bottlenecks while recommending actions to mitigate the same. They shall compile systematic records of Contractor’s site activities to adequately document the progress and performance of the work. These records shall support determination of responsibility for slow progress of contracts.
- 8.3.2 The PMC shall certify the requirement of material at site, based on site progress and lead time for manufacturing & delivery of the construction material and advise the Contractor to ensure that the material is available for the works.
- 8.3.3 The PMC shall carry out inspection of all incoming material at the site as per approved drawings, technical specifications, and relevant standards. A detailed inspection report shall be submitted to the Client after such inspections along with a CD showing inspection procedure carried outwork, based on which the material is allowed to be used at the Works. If any deviation is found, the material may be rejected and brought to the notice

of the Client. The PMC shall monitor that all material rejected at site is immediately removed from Contractor's stores and not used in the project. They shall prepare and maintain inspection and engineering report and records and make them available to Client as and when required.

- 8.3.4 The PMC shall monitor that Contractor's store is well maintained, access is controlled, documentation is up to date, electricity connection (including emergency backup), is available and the material stored is laid on brick padded/concrete area. The ground level of store should be higher than the surrounding/adjoining roads. Adequate security is deployed by the Contractor to ensure safe custody of material.
- 8.3.5 The PMC shall maintain adequate presence of their personnel at site to ensure project quality, monitor adherence to time schedule and quantity utilization as per invoice submitted status, assess the adequacy of materials and labor deployed by the contractor and methods of work in relation to the required progress, and advise the Contractor, as and when required, to take appropriate action to expedite progress and maintain quality. The PMC shall maintain and regularly update a list of the contractor's commitments & work status with respect to L2 network.
- 8.3.6 The PMC shall examine and make recommendations on all invoices and claims received from the Contractors for time extension, extra compensations (including price variation), new items, extra work or expenses etc. In this respect, the PMC shall certify positive and negative quantity deviation with respect to the contracted quantities, review justification and costing for new items (prepared by the Contractor) and support Client in obtaining internal approvals. The PMC shall also determine the amount to be added, or deducted for payments to the Contractor because price variation (as per contract), additional work or adjustment of advances etc.
- 8.3.7 The principal responsibilities of the PMC will be to assist the Client in the following:
 - 8.3.7.1 Assist the client to issue the Order to Commence to the Contractors;
 - 8.3.7.2 Control and report over Project implementation with strict adherence to the bid documents.
 - 8.3.7.3 Approve the contractor's work program and the source of materials;
 - 8.3.7.4 Authorize the Contractors' subletting parts of the work;
 - 8.3.7.5 ; Resolve ambiguities and/or discrepancies as per provisions of the Contracts
 - 8.3.7.6 Review, verify and further detail the design of the contract works, to approve the Contractors' working drawings and, if necessary, to issue further drawings and/or to give instructions to the contractor; assist the contractors to establish appropriate survey control systems and supervise the survey works executed by the contractor
 - 8.3.7.7 Approve the setting out of the works, including inspecting the quality, standards and adequacy of the disposal sites
 - 8.3.7.8 Approve the Contractors' key superintendence personnel, construction programs, site office / workers' camp to be arranged by the Contractor, materials and sources of materials;
 - 8.3.7.9 Order special tests of materials or completed works and/or removal and substitution of improper materials and/or work as required;
 - 8.3.7.10 Control and appraise the progress of the works, to order suspension of works and to authorize extensions of the period for completion of the works;
 - 8.3.7.11 Issue variation orders, evaluate variations, fix rates for un priced work, or order day work, and/or to make recommendations to the Client regarding alternatives;
 - 8.3.7.12 Review the invoices raised by the Contractor on the basis of joint measurement taken with the Contractor as well as designated officers of the DPIUs in accordance with prefixed program to be informed to all concerned and to be checked subsequently. It is clarified that functioning of PMC will not be

- hampered in case of non-availability of Contractors and DPIUs.
- 8.3.7.13 Issue interim certificates for payment to the Contractors based on measured work items or to certify the completion of the works or parts thereof;
 - 8.3.7.14 Inspect the works periodically, during the construction period and the Defects Liability Period and to issue Defects Liability Certificates after the rectification by the Contractor of possible defects,
 - 8.3.7.15 Prepare a Practical Completion and Outstanding Defects Report for each construction contract, that will be the culmination of the procurement process initiated during the tenure of the PMC, a Final Completion and Handover Report for each construction contract
 - 8.3.7.16 Inspect, test, prior to acceptance and commissioning of SCADA including electro-mechanical and structural components of the electro hoisting arrangement, to be retrofitted for operationalizing SCADA
 - 8.3.7.17 Carry out generally all the duties of the Engineer/Engineer-in-Charge/Project Manager as specified in the Contract, within the limitations specified therein;
 - 8.3.7.18 Advise the Client on all matters relating to claims from the Contractor and to make recommendations thereon, including the possible recourse to arbitration; and
 - 8.3.7.19 Prepare a master document list with “as built” drawings and records, and operation manuals, construction Supervision Manual outlining routines and procedures to be applied in contract management, construction supervision and administration.
 - 8.3.7.20 Ensure that the contractors achieve all construction performance measures and especially those related to; time, cost, quantity and quality, environmental protection, community relations, worker health and safety, protection of works.
 - 8.3.7.21 Always invite the Project Authority (I&WD) through ‘Inspection Call’ during the measurement of work / work component for transparency.
- 8.3.8 The consultant shall provide an independent view on progress of works with reference to the baseline schedule, based on progress reports generated prepare look ahead schedules periodically based on progress achieved at site to provide visibility on forecasting and time of completion. This will also include updating the mobile app, already developed, for daily and monthly reporting from the site (with GIS tagged photographs and technical data using drones and/or other suitable visual trackers)*, monthly/quarterly monitoring of each structure and work component with progress reports for the Chief Minister’s Office , the IWD and the World Bank for reporting on following:
- 8.3.8.1 Progress of Works, deployment of infrastructure, manpower, machinery etc
 - 8.3.8.2 Site flash reports, site meeting reports and action item list agreed between all relevant parties
 - 8.3.8.3 Schedule Updates and variance
 - 8.3.8.4 Look-ahead Schedule and Catch up plans required
 - 8.3.8.5 Issues needing escalation
 - 8.3.8.6 Variance (Budget vs Actual)
 - 8.3.8.7 Cost and Time to Complete based on progress
 - 8.3.8.8 Risk Response Tracking
- *NB: Cost of using/hiring such drones/visual trackers will be borne by the Client separately outside the scope of this contract
- 8.3.9 Prepare the agenda and hold regular progress meetings (every two weeks) or as decided by the authority with the contractors and the Engineers and prepare minutes of all such meetings.
- 8.3.9.1 Review “As Built” drawings, prepare Records and Operation manuals, Defects

report, final completion and handing over report for the constructions that will be the culmination of the execution of the civil works during the tenure of the PMC.

- 8.3.9.2 The consultant shall prepare cash outflow plans on monthly/quarterly/annual basis referencing the baseline budget, milestone plans and approved billing breakup, assess variance with respect to the actual/planned progress, track, update project cost budget vs actual statement, based on received cost reports, prepare cost to complete estimates based on actual progress & updated schedule in discussion with internal project teams and contractor teams, prepare cash flow forecasts on monthly/quarterly basis based on the look ahead schedule and progress of works in discussion with contractors. Review invoices and assist the Department in preparing documentation for processing invoices as per World Bank guidelines and requirements.
- 8.3.10 The consultant shall facilitate coordination among the SPMU, DPMUs and DPIUs of IWD as well as other implementing Departments.
- 8.3.11 The consultant shall provide the Client with technical assistance to prepare technical, financial management and procurement reports of the project (including bid evaluation reports), and other project progress reports that the SPMU, DPMUs and DPIUs are required to submit to the appropriate authorities and to the World Bank. These would include, but not be limited to, Annual Work Plans, Budgeting, Financial Monitoring Reports (FMRs) including Interim Unaudited Financial Report (IUFP), Procurement Plans and Reports, Bid Evaluation Reports, Terms of Reference and Project Monitoring and Progress Reports at each D P I U , DPMU and SPMU including the projected cash flow, up to date project expenses and certified payments and outstanding payments under the contracts. The PMC would also be required to update the Procurement Plan, Project Implementation Plan and upload all procurement related activities on the World Bank's STEP Portal.
- 8.3.12 The Consultant will prepare TORs, Request for Proposals and Bid Evaluation Reports for the following consultancy assignments that will be implemented during project implementation:
 - 8.3.12.1 Citizen engagement and preparation of a communication campaign, including (i) preparation of an annual Citizen Report Card, (ii) establishment of a third-party complaint mechanism, (iii) preparation of Service Level Standards (SLSs) for irrigation services, (iv) introduction of performance-based O&M, (v) use of micro-irrigation for groundwater, and (vi) dissemination of project results across India
 - 8.3.12.2 Groundwater analysis
 - 8.3.12.3 M&E
 - 8.3.12.4 Capacity Strengthening Needs, Assessment and Preparation and Implementation of Specialized Capacity Strengthening for the Project Stake Holders, particularly, for the Private Irrigation Operators.
 - 8.3.12.5 Asset Management.
 - 8.3.12.6 The Consultant will also co-ordinate with the other Consultants so as to enable them to work together effectively under the general guidance and control of the Project Director, to achieve the Project objective.
 - 8.3.12.7 The Consultant will act as the Lead Consultant and advise the Project Director about implementation of the recommendations of the other Consultants in a seamless and timely manner within the available framework of Project Implementation arrangement.
- 8.3.13 The Consultant shall become familiar with the requirements of the World Bank safeguards operational policies (OPs) applicable to the project, mentioned in the ESMF/ESMP. The

Consultant shall pursue and follow the ESMF/ESMP approved by the World Bank, monitor and supervise the environmental protection measures undertaken to mitigate environmental impairment due to construction activities at project sites and at the Disposal site. The consultant shall also support the SPMU for any temporary resettlement and related documentation and also liaise with the local stake holders for smooth implementation of Resettlement Plans.

- 8.3.14 Develop and operate the Grievance Redressal Mechanism (GRM), which will include but will not be limited to administering complaints from Project Affected Persons (PAPs) in a systematic way on a day to day basis
 - 8.3.14.1 Update complaints on the website, informing the complainants, on the status of their complaints well as providing feedback or follow- up actions
 - 8.3.14.2 Assist the client in providing acceptable follow-up actions on complaints, ensuring that decisions are made based on transparent, fair, independent, and accountable processes through Grievance Redress or Complaint Handling Advisory
 - 8.3.14.3 Provide recommendations to the client on redressal of complaints
- 8.3.15 Train technical staff (including any assigned counterpart staff) of the client in the discipline of construction supervision. The training shall be competency-based hands on, on the job style training. The Consultant will co-ordinate and liaise with the implementing departments (IWD, Agriculture, Agri Marketing, Fisheries, F.P.I.& Horticulture Departments), the SHGs /FPOs, the other community-based organizations for their capacity building, scheduling and budgeting of the various trainings with monitoring on the same towards the successful implementation of the Project objectives or the private operators the trade specific training will be arranged and imparted by the PMC based on the guidelines provided by the concerned Transaction Advisor the PMC will monitor the training schedules and suggest the SPMU for its improvement, if any required as a part of the stakeholder consultation process
 - 8.3.15.1 Train IWD staff on maintenance and updating of MIS, so that it can be used even after completion of the project.
- 8.3.16 Assist the Client in Inspecting, Testing, Commissioning and Acceptance of SCADA including electro-mechanical and structural components of the electro hoisting arrangement, to be retrofitted for operationalizing SCADA
- 8.3.17 Maintain a project / contract document control and filing system in Project MIS System with hard copy as well which would be accessible to the Client and the World Bank Officials.
- 8.3.18 Monitor and report on any activities at all of the project's "linked" sites, either direct or indirect.
 - 8.3.18.1 Provide advice to the client on any possible claim or concerning contractual problems arising during implementation of works.
 - 8.3.18.2 Assist DPIUs to resolve disputes as they arise, should a dispute become intractable, assist DPIU to compile all necessary reports, documents, and evidence needed for presenting its claim to arbitration or litigation.
- 8.3.19 The Consultant will help the Client in management of the project with GIS Tagging etc as per standard practice and reflecting the real-time and spatial progress in maps with appropriate layers, as directed by the Project Authority.
- 8.3.20 The Consultant will help the Client towards supplementary modeling and updating of the existing modeling in flood sector, in addition to the modeling already done by the FS Consultant. Such supplementary modeling will include but may not be limited to, assessment of efficiency of flood forecasting system as being operationalized by the DVC authority in the project area as well as of the inundation area mapping to be done by the

GIS Expert. The software of MIKE II and MIKE (Flood) etc are required to be used in modeling to make the supplementary modeling synchronized with the already done modeling by the FS Consultant.

8.3.21 Maintain a data bank for documentation based on the primary information about quality and quantity of works directly from site and secondary information for other aspects.

8.3.22 The Consultant will attend the discussions, interactions with the people's representatives, the District and State administration, the local bodies, the World Bank and report forthwith to the Employer as well as assist the Employer as may be requested.

8.3.23 The PMC shall abide by the job safety measures prevalent in India and will free the PMU from all demands or responsibilities arising from accidents or loss of life to its personnel. The PMC will pay indemnities arising from such incidents and will not hold the GOWB responsible or obligated.

8.4 Implementation of Environment, Social, Health and Safety (ESHS) Management

8.4.1 IWD has prepared and disclosed the Environment and Social Management Framework (ESMF) which shall guide implementation activities. The Consultants are required to familiarize themselves with the provisions of this document. ESMF includes processes to identify environment and social impacts of the project, and lays down a generic mitigation framework to address adverse impacts. A more specific Environment and Social Management Plan has to be prepared by the PMC for each contract package based on the generic ESMP & ESMF prepared by the ESIA Consultant. The Consultant is further to ensure that all the applicable mitigation plan and safeguard polices as per ESMP & ESHS are strictly adhered to by the works contractors during implementation of the project activities

GG. Role of Key Experts and other Non-Key Experts/Personnel

9.1 Key Experts

9.1.1 **Team Leader:** He/She will lead the designing, scheduling, procurement, implementation, quality control, environment & social management and wrapping up of the project involving various activities already detailed in "FF-Scope of Services" as per agreed/modified time schedule of the World Bank & the IWD. As a part of the above stated broad job description, the Team Leader will keep close co-ordination with all the stake holders, particularly with the fellow Consultants either already engaged or being engaged by the SPMU, DPMUs and DPIUs of the IWD and other four implementing departments

The Team Leader will be solely responsible for monitoring the output of other Experts and/or other category of staff to be provided by the PMC, report to the Project Director and lead the discussions during interactive meetings with World Bank or other State/Central Government Departments/Organizations

9.1.2 **Deputy Team Leader/QA/QC Engineer:** He/She is required to assist the Team Leader in the performance of the agreed tasks & to keep close co-ordination with all the experts of the PMC to achieve the desired outcome of the deliverables in a timely way. In

his/her capacity as QA/QC Engineer, s/he will work closely with the client and assist the Team Leader in monitoring and testing and ensuring adherence to the Quality Assurance Plan (for civil works) in accordance with the provision of the Project Operation Manual, which may receive updating from time to time as per standard /accepted norms.

- 9.1.3 **Senior Environment Expert:** As a part of the Environment & Social cell of the PMC, the Environment Expert will work closely with the client and the stake holders, the project implementing agencies for incorporating the environmental safe guards in the bidding documents, monitoring, ensuring and reporting of its implementation, and advice the Project Director, WBMIFMP, about the redressal of any shortcoming in implementation of the safeguards. He/ She will also co-ordinate with the statutory agencies (like the WBPCB, the Forest Departments etc) and the representatives of the World Bank for necessary support to the SPMU, DPMU and DPIU in securing regulatory clearances. He /She will prepare and also review the Information Education & Communication (IEC) materials, the Environment Assessment Report (EAR) and other necessary documents on environment issues. For the purpose he/she will make regular visits to the work sites and also provide guidance to the DPIUs.

She/he will maintain a data base on the status of various environmental safeguard related issues and submit regular/monthly reports accordingly, follow up with the DPMU, various line Departments of the Govt. of West Bengal, the Govt. of India and the relevant World Bank Officials and conduct environmental audit and perform any other activities related to environmental issues of the project.

- 9.1.4 **Senior Social Development and Gender Specialist:** As a part of the PMC, he/she will have the key responsibility of ensuring effective integration of social safe guards and due diligence (as per the World Bank norms) into the design, implementation and appraisal of the project interventions. Accordingly, he / she will track the socioeconomic cultural profile of the communities in the project area, assess the impacts / benefits of the projects from time to time, work out strategies to address the issues in gender / land and indigenous people, as required, develop methodologies for community mobilization, training, orientation, monitor their progress and generate reports as required by the Project Director. He / she will also co-ordinate with the line Departments, NGO, SHG, implementing Departments (IWD & other partner implementing Departments of Govt. of West Bengal) in formation / mobilization / updating / of community-based institution and their capacity building. He / she will also co-ordinate with all the stake holders in implementation of Social Impact Appraise (SIA), Social Resettlement Plan its monitoring and review

- 9.1.5 **Procurement Specialist:** As a member of the PMC, he/she will assist the Team Leader in preparing Bid Documents, including Notice inviting Bids, Bill of Quantities, tender drawing, specification, modes of measurement, quality control measures and terms & condition, etc. for all the packages with further modifications, if necessary, within the stipulated time frame, as per World Bank norms. He will draft all documents related to the EOI, TOR, RFP, RFB, RFQ, etc., as applicable, for each of the packages as per World Bank norms.

She/he will facilitate the procurement processing through assistance towards arranging public notices, evaluation of the bids, uploading the procurement data in STEP of the World Bank, advise the client on size of the bid packages after market survey and in accordance with the Project Procurement Strategy Document (PPSD). Apart from the preparation of the bidding documents of 70% of the project investment (which is beyond the scope of the Feasibility Study Consultant's; scope of work). He/she will also advise the Project Director in monitoring the ongoing procurement related activities identified during the project preparation stage (approximately 30% of the total project investment) and suggest modification, if any, required and applicable, to the Project Director. Apart from above he/she is to evaluate bids independently, to help the officers of the SPMU during negotiation with the agencies, if required, and to offer suitable

- recommendation for acceptance of bids.
- 9.1.6 **Pressurized Irrigation Specialist:** The specialist will design two pressurized irrigation pilots and will assist in the supervision of the installation works.
- 9.1.7 **Senior MIS Specialist/Developer:** As a part of the PMC, he/she will be undertaking the designing, project management, and advising on implementing an integrated Web- GIS & MIS system for representative indicators to achieve and monitor the project objectives. He/she will advise and assist the Client on systematically capturing the data requirements to track both the physical and the financial progress, implementation issues, audit reports, Grievance Redressal Mechanisms.
He/she will advise and assist the client towards procurement of Software, Satellite Imagery etc., needed for the development of GIS & MIS system which can be finally integrated with the departmental MIS system of IWD. He will assist the client in monitoring & evaluating the MIS layers throughout the project activities & train the MIS managers, as required for the purpose of monitoring & evaluation and regular dissemination of data to the stakeholders.
- 9.1.8 **Institutional Development Co-ordinator & Training Manager:** He/she will co-ordinate and liaise with the implementing departments (IWD, Agriculture, Agri Marketing, Fisheries, F.P.I.& Horticulture Departments), the SHGs /FPOs, the other community-based organizations for their capacity building towards the successful implementation of the Project objectives. He/she will develop, monitor, review, budget the training schedules, training materials, for various types of training etc. after discussion with the related experts in PMC and the client any other Govt. Departments as felt necessary and maintain data bank & update the data in MIS platform, as required by the project Director. He/she will assist the project authority in a comprehensive manner to facilitate arrangement of site visit of the external auditors/World Bank officials/visiting Govt. officials or dignitaries in consultation with the SPMU, DPMU, & DPIUs, as necessary.
- 9.1.9 **Construction Manager (Civil):** To achieve the project objectives he would supervise and monitor day to day progress of the work and will finally report to the Client through the Team Leader, ensuring strict compliance of ESIA in the field activities, proper observance of the QA/QC Plan, review of the documents/ drawings produced by the contractor, keeping the records of the work and managing of the assets with GIS tagging. He would also review the invoices raised by the agency on the basis of measurements taken by him, jointly with the agency and different officers of the DPIUs, along with subsequent checking as per stipulated norms.
- 9.1.10 **M&E specialist:** Will capture and collect data relating to PDO Indicators and the Intermediate Results Indicators agreed to by the World Bank.

9.2 Non Key Experts

- 9.2.1 **QA/QC Engineer (Mechanical & Electrical):** To work closely with the client and assist the Team Leader in monitoring and testing and ensuring adherence to the Quality Assurance Plan (for mechanical & electrical works) in accordance with the provision of the Project Operation Manual, which may receive updating from time to time as per standard /accepted norms.
- 9.2.2 **Water Resource Specialist:** He/she as a part of the PMC will assist the SPMU in, design monitoring and management of both surface and ground water resources, within the project area.
- 9.2.3 **MIS Specialist:** He/she will design, develop software, operate, maintain and update the MIS and Web-GIS system for the project under the direction of senior MIS Specialist
- 9.2.4 **Senior MIS Manager:** Will assist the senior MIS specialist in performing his task in the

SPMU and will also be involved in software development, User Interface(UI) designing etc. during the development phase of the MIS. After development, he/she will start functioning with the DPIUs and shall provide necessary guidance/monitoring to data input in MIS.

- 9.2.5 **MIS Manager:** Will assist the senior MIS Manager in performing his task in the SPMU, he/she will start functioning with the DPIUs and shall provide necessary guidance/monitoring to data input in MIS.
- 9.2.6 **SCADA Specialist:** Will design, document, implement and maintain essential SCADA and control systems, provide appropriate and timely technical advice on matters relating to SCADA and control systems, preparation of ToR and bid document, site visits and review performance of the SCADA systems.
- 9.2.7 **Hydraulic Modeler:** He / She will apprise himself / herself of the hydrodynamic modeling as prepared and provided by the Feasibility Study Consultant using MIKE Flood Software. During the progress of the implementation of the project activities the expert needs to update those models incorporating additional data and references from the site, as required. Further modeling and providing output, if necessary for the project implementation, also need to be done by the expert.
- 9.2.8 **RS-GIS Expert:** Will be required to develop GIS layers/shape files on Arc-GIS software, assist in GIS tagging of the assets of the project to meet the requirements of the client and the World Bank including data upload in web-GIS system
- 9.2.9 **Legal Aid & Conflict Resolution Specialist:** He/she will assist the DPIUs, to resolve the disputes with the contractors as they arise and should the disputes become intractable, he/she will assist the DPIUs to compile all necessary reports, documents and evidences needed for presenting the claim of the client to arbitration or litigation as directed by the Project Director. He/she will assist the formulation of the tender following the Standard Bidding Document of the World Bank in view of the legal aspects. As required by the Project Director he/she will also assist the project authority in drafting the responses of the client against the claims made by the contractors. Apart from the above he/she will need to perform other legal and other related tasks and advise appropriately to assist the project authority from time to time. Further he/she will assist the project authority in raising legal awareness of the SHGs/FPOs/Private operators participating in the project in connection with achieving the aspects/goals of the project.
- 9.2.10 **Construction Manager (Mechanical & Electrical):** To achieve the project objectives he would supervise and monitor day to day progress of the work and will finally report to the Client through the Team Leader, ensuring strict compliance of Environmental and Social Impact Assessment (ESIA) in the field activities, proper observance of the QA/QC Plan, review of the documents/ drawings produced by the contractor, keeping the records of the work and managing of the assets with GIS tagging, He would also verify the bills raised by the agency on the basis of measurements taken by him, may be jointly with the agency, and checked by different officers of the DPIUs as per stipulated norms
- 9.2.11 **Site Engineer (Civil):**To assist the Construction Engineer (Civil) in discharging his duties to achieve the project objectives
- 9.2.12 **Site Engineer (Mechanical & Electrical):** To assist the Construction Engineer (Mechanical & Electrical) in discharging his duties to achieve the project objectives
- 9.2.13 **Environment Expert:** As a part of the Environmental and Social cell of the PMC, she/he will assist the Senior Environment Expert in discharging his duties in all respect regarding the environmental issues of the project.
- 9.2.14 **Social Development and Gender Specialist:** He/she will assist the Senior Social Development and Gender Specialist to achieve the project objectives complying with the World Bank norms regarding social aspect.
- 9.2.15 **AutoCAD Expert:** The AutoCAD Expert will be required to produce maps and drawings based on AutoCAD and also on Google Earth platform, as may be required by the SPMU.

9.2.16 **MIS Assistant:** He / She will perform various types of data input in MIS at SPMU/DPMUs/DPIUs levels as per instruction /guidance provided by Senior MIS Manager/MIS Assistant.

HH. Expertise Required, Estimated Man Month and Assignment Period

10.1 The Consultant is required to provide suitable staff and support services to carry out the tasks outlined in the "FF- Scope of Services" for the periods shown below. The following describes the expected required technical inputs to be provided by the Consultant together with the expected qualifications, background and experience.

Sl. No.	Key Experts	Preferred minimum educational qualification	Preferred experiences or eligible assignments	Estimated man months
1.	Team Leader(1)	Graduation in Engineering /preferably in Civil/Construction and Post Graduation Degree/Diploma in Management, preferably in Project Management	At least 15 years' experience in management of projects, preferably in water resource sector in a wide variety of countries. One of his /her assignment should be in World Bank funded project in the capacity of a Team Leader/Deputy Team Leader. Familiarity with computer application and software would be preferred	66
2.	Deputy Team Leader and QA/QC Engineer Civil(1)	Graduation in Civil/Construction Engineering or Equivalent, with Post Graduation in any field	She/he should preferably have at least 15 years experience in planning and implementation of water resources project in a wide variety of countries. One of his /her assignment should be in World Bank funded project in a senior position preferably in India.	66
3.	Senior Environmental Expert(1)	Graduation in Civil Engineering or Equivalent, and Post Graduation in Environmental Engineering	At least 10 years of experience in the preparation of Environment & Social Impact Assessment of large-scale infrastructure projects, preferably in water resources sector, during last five years at least one of which should be under World Bank funding. The specialist should also be fully conversant with formulation of various policy frame-works and action plan in accordance with the safeguard policies of the World Bank, on environmental assessment, natural habitats, pest management, physical cultural resources, dam safety, international waterways, dredging of rivers / channels and involuntary resettlement.	60
4.	Senior Social Development & Gender Specialist (1)	Post Graduation in Sociology / other relevant field.	At least 10 years experience in designing and implementing social assessment / development programmes in large-scale infrastructure projects. The Expert should have working experience on issues pertaining to vulnerable community, resettlement and rehabilitation, religion	60

Sl. No.	Key Experts	Preferred minimum educational qualification	Preferred experiences or eligible assignments	Estimated man months
			and gender and a solid background on handling consultations with multiple stakeholders, at least in one World Bank project. The Expert should be conversant in local language (Bengali)	
5.	Procurement Specialist (2)	Graduation in Engineering with Post Graduate Degree/Diploma in Management having specialization in Contract Management. Or Master Degree in Commerce or Management with specialization in Contract Management	At least 10 years experience in handling procurement of works, goods, consultancy and non-consultancy services, in major water resources or power or similar projects, with specific experience of working as procurement specialist. At least two of such exposure should be in a World Bank funded project.	2 x 40=80
6.	Pressurized Irrigation Specialist (1)	Graduation in Civil Engineering and Post Graduation in Water resources / or equivalent	At least 10 years field experience in the design and installation of pressurized irrigation projects.	60
7.	Senior MIS Specialist/Developer (1)	Graduation in Computer Science / Information Technology or MCA or equivalent in other relevant field.	At least 15 years experience in design of MIS application for monitoring and evaluation of major development projects. It is desirable to have proven credential of developing and maintaining MIS and Web-GIS systems for at least one project during last 5 year.	60
8.	Institutional Development Coordinator & Training Manager(1)	Graduation in any discipline with post graduate on Human Resource Management	He / She should have a minimum of 10 years of experience in Human Resource Management .At least one such experience should be in any NGO or similar other organization dealing with self help groups etc	36
9.	Construction Manager(Civil) (8)	Graduation in Civil Engineering or Equivalent	At least 5years field experience in projects preferably in irrigation/flood management sector. Retired Executive/Assistant Engineers of IWD may also be engaged for this purpose following standard procedure	8 X 56 =448
10.	Monitoring & Evaluation Specialist(1) (M&E)	Post Graduation in Statistics or Economics or Agricultural Economics or equivalent	She/he should preferably have at least 10 years experience in concerned field and should be well versed in mining data with various M&E methods and tools and with statistical software packages such as Statistical Package for the	60

Sl. No.	Key Experts	Preferred minimum educational qualification	Preferred experiences or eligible assignments	Estimated man months
			Social Sciences (SPSS) or Stata. One of his /her assignment should be in World Bank funded project in a senior position preferably in India.	

Sl. No.	Non-Key Experts	Preferred minimum educational qualification	Preferred experiences or eligible assignments	Estimated staff months
1.	QA/QC Expert Mechanical& Electrical (1)	Graduation in Mechanical/ Electrical Engineering or Equivalent	At least 7 years of relevant professional experience in developing and monitoring the quality control of the works.	6
2.	Water Resource Specialist (1)	Graduation in Civil Engineering and Post Graduation in Water resources / or equivalent	At least 10years experience in design and planning of water resource project	36
3.	MIS Specialist (1)	Graduation in Computer Science/Information technology or equivalent	At least 10 years experience in design, software/database development and operation of MIS	1X24=24
4.	Senior MIS Manager(2)	Graduation in Computer Application or equivalent.	At least 10 years experience in designing, software/database development and operation of MIS. One of his /her assignment should be preferably in a World Bank or similar funded project	2 X 60 = 120
5.	MIS Manager(4)	Graduation in Computer Application or equivalent.	At least 5 years experience in designing, software/database development and operation of MIS.	4 X 60 = 240
6.	SCADA Specialist(1)	Engineering Graduate in Electrical Engineering/ Telecommunication Engineering/ Electronic Engineering or	At least 3 years of experience in designing, installation, operation and maintenance of SCADA system in water resources/irrigation applications.	30

		equivalent		
7.	Hydraulic Modeler(1)	Post Graduation in Hydrology with graduation in the relevant field	At least 5 years of experience in the field of hydraulic modeling in water resources project, preferably in flood management/drainage sector	18
8.	RS-GIS Expert(1)	Graduation in any stream of Engineering or Post Graduation in Science / Geography / Geology / Hydrology / Agri-cultural Science or equivalent. Further Post Graduation / PG Diploma in GIS and Remote Sensing is essential.	At least 3 years of experience for Post Graduates (M. Tech. or equivalent) and 6 years of experience for PG Diploma Holders, of working as RS-GIS Specialist in projects, related to water resources, preferably in major irrigation sector.	30
9.	Legal Aid & Conflict Resolution Specialist (1)	Graduation in Law	He / She should have a minimum of 10 years of experience in handling of management of contractual litigations/arbitration in World Bank or similar externally funded projects	15
10.	Construction Manager(Mechanical /Electrical) (1)	Graduation in Mechanical /Electrical Engineering, or Equivalent.	He should have a minimum of 5 years of experience in the construction projects involving hydro-mechanical/electro-mechanical components. Retired Executive/Assistant Engineers of IWD may also be engaged for this purpose following standard procedure	30
11.	Site Engineer Civil(16)	Diploma in Civil Engineering or Equivalent	At least 5years field experience in projects preferably in irrigation/flood management sector. Retired Assistant Engineers/Junior Engineer of IWD may also be engaged for this purpose following standard procedures.	16 X 56 =896
12.	Site Engineer Mechanical/Electrical (2)	Diploma in Mechanical/ Electrical Engineering or Equivalent	At least 5years field experience in projects preferably in irrigation/flood management sector. Retired Assistant Engineers/Junior Engineer of IWD may also be engaged for this purpose following standard procedure	2 X 30 =60
13.	Environmental Expert(2)	Graduation in Civil Engineering or Equivalent, and preferably Post Graduation in Environmental	At least 7 years of experience in the preparation of Environment & Social Impact Assessment of large-scale infrastructure projects, preferably in water resources sector, at least one of which should be under World Bank funding.	2X 60=120

14.	Social Development & Gender Specialist (2)	Engineering Post Graduation in Sociology / other relevant field.	The specialist should also be fully conversant with formulation of various policy frame-works and action plan in accordance with the safeguard policies of the World Bank, on environmental assessment, natural habitats, pest management, physical cultural resources, dam safety, international waterways, dredging of rivers / channels and involuntary resettlement. At least 7 years experience in designing and implementing social assessment / development programmes in large-scale infrastructure projects. The Expert should have working experience on issues pertaining to vulnerable community, resettlement and rehabilitation, religion and gender and a solid background on handling consultations with multiple stake preferably in World Bank or similar externally funded projects. The Expert should be conversant in local language (Bengali)	2X60=120
15.	AutoCAD Expert(1)	Pass out from ITI, Certificate Course in AutoCAD.	At least 10 years experience in the field of AutoCAD, preferably in hydraulic and Industrial structures, in major projects.	60
16.	MIS Assistant(7)	Graduation in any stream with certificate in Computer Application / Diploma in Information Technology / relevant field.	At least 3 years of experience of working with MS Office in Government / Private Organization. It is preferable to have experience of working on MIS. Minimum typing speed should be 40 words per minute. It is also desirable to have exposure on networking, preparation of Power Point Presentation and on exchanging communication through e-mail.	7X60=420

Note 1: In case of engagement of multiple experts for a sector/task, the actual engagement period of individual /group of experts may be staggered depending on requirement of workload and other reasons which will be decided in due course

The total number of staff months is 3,221.

II. Client's input & Counterpart Support and Facilities

11.1 The Client's Input

The Client will assign staff under the SPMU, DPMUs and DPIUs to work the PMC as counterparts whose principal task will be to facilitate the conduct of the services and to gain a sound transfer of knowledge and understanding of the methods and approaches used in the conduct of services to enable the implementing Departments to maintain the community of the Project Operation Maintenance after completion of the assignment of the PMC. It must be clearly understood providing counterpart staff by client does not dilute any obligation and responsibilities of the

Consultant and no adjustment in its estimated manpower of the Consultant will be made.

11.2 The relevant data & operational records as are available in the offices of the client will be made available to the PMC, as required. More specially the following sets of data are to be handed over readily to the PMC:

11.2.1 Line diagram of the existing irrigation canal system, Long section of the canal system showing relevant information for main and branch canals,

11.2.2 List of stretches of irrigation canals for which survey data are available as per typical drawings of the following type of irrigation structures:

- Head Regulator of Main Canal (i) at the off take of LBMC (ii) at the off take of RBMC
- Cross Regulator of Main Canal (i) at 9.87 km of LBMC (ii) at 16.46 km of RBMC
- Cross Regulator of Branch Canal (i) at 3.07 km of DBC (ii) at 8.17 km of DBC (iii) at 16.10 km of PBC (iv) at 21.45 km of PBC
- Canal Fall Structure
- At 0.61 km of escape channel off taking from 22.50 km of LBMC
- Typical cross section of canal outlet 1 No.
- Details drawing of Hume Pipe Syphon Structure at 30.50 km of LBMC

11.2.3 List of stretches of rivers and drainage channels for which survey data are available.

11.2.4 Input files on Mike-11 hydrodynamic model in Lower Damodar areas

11.2.5 Geo-referenced maps:

11.2.5.1 Index Map showing Damodar Valley (DV) Command area and Lower Damodar area

11.2.5.2 Index Map showing canal system primarily identified for 1st Phase execution

11.2.5.3 Index Map showing drainage infrastructure primarily identified for 1st Phase execution

11.2.5.4 Map showing locations of cross sections of irrigation canals recently surveyed

11.2.5.5 Map showing locations of surveyed cross sections of different rivers & channels of Lower Damodar region

11.2.6 Other Data:

11.2.6.1 Historically observed gauge level and discharge data of Damodar River System at identified locations

11.2.6.2 "Detailed Project Report to alleviate flood water logging and erosion problem for Lower Damodar region", CES Ltd. May 2015.

11.2.6.3 **Additional survey data required for finalization of the remaining 70 % bidding documents will be provided to the consultant by the Client.**

11.3 Feasibility Study Report including the baseline data, the bid documents and design & drawing of 30% project investment prepared by EPTISA, Feasibility Study Consultant, in 2018.

11.4 Environmental and social impact assessment report prepared by CTRAN, ESIA Consultant, in 2018.

11.5 Copy of the report of the Rapid Irrigation Modernization Assessment- Damodar Valley Command Area under WBMIFMP

11.6 Copy of the draft report of the Transaction Adviser for changes in operation and management policies in connection with engagement of private operators for management, operation and maintenance of irrigation delivery system under WBMIFMP

11.7 The consultant will have access to all the related documents and reports for the SPMU, DPMUs and DPIUs and will prepare the physical and financial progress reports based on the data collected from the SPMU, DPMU and DPIUs as a secondary source and also directly from the work sites as a primary source as necessary

- 11.8 The client will help the PMC in collection of secondary data from the other Government Departments as available.
- 11.9 Facility of using MIKE-11, MIKE-Flood and ARC-GIS Software will be provided to the consultant free of charge for their preparation of required project deliverable of WBMIFMP
- 11.10 Note: All software (apart from the mentioned above), IT Equipment, survey equipment as necessary need to be arranged by the consultant
- 11.11 The PMC will be given necessary guidance by the designated Nodal Officers in the Department s of Agriculture, Agri Marketing, Fisheries and FPI&H. as required
- 11.12 The PMC personnel will be working as the team of the SPMU, WBMIFMP. Thus it will get support and guidance of the Project Director and his sub ordinate officers as and when required
- 11.13 The IWD shall provide Non-AC office area (around 2000sqft at SPMU, and around750sqft at each DPIU) will be provided to the PMC throughout the incumbency of the contract.
- 11.14 It is proposed that (a)2 nos. of Construction Managers (Civil), 4 nos. of Site Engineers(Civil), 1 no. MIS Manager will be provided office space in each DPIU of IWD, (b) 1 no. of Environmental Expert and 1 no. of Social Development & Gender Specialist will be provided office space in each DPMU of IWD, (b) The rest of the key experts and the non-key personnel will be provided office space in SPMU. Any additional space requirements to house its staff will have to be arranged by the consultant in nearby locations of SPMU/DPMU to be discussed and finalized with the Client.
- 11.15 No transport facility will be provided to the Consultant.

JJ. Deliverables of the Consultant

- 12.0 The Consultant (PMC) through their Team Leader will work collaboratively with the Project authority to achieve the project goals laid out in this document. The PMC will work under the overall guidance of the Project Director and will report to him for the purpose. The Consultant will be responsible for overall co-ordination of the field works and for the performance of the Consultant’s team to implement the chosen solutions. Deliverables of the Consultant will be considered to have been formally accepted only after he communicates so in writing. Any queries regarding the deliverables will have to be answered by the Consultant preferably within 5 working days. The Consultant will share with the Client all intermediate documents, drafts, reports, methodologies, surveys and any other item related to this assignment. No work products, methodology or any other methods used by the Consultant should be deemed as proprietary and non-shareable. As per the request of the Client or the World Bank, the Consultant will conduct workshops, prepare presentations with resource materials and also record the proceedings of the workshop. The PMC will assist the SPMU, DPMUs and DPIUs to perform their designated task.
- 12.1 The following outputs and deliverables are expected from the assignment. These will be produced in accordance with the overall assignment work plan and schedule of project activities. Unless otherwise stated, 6(six)copies of all reports and presentation materials in English need to be provided by the consultant:

Report	Time of delivery
Inception Report with a description of the project scope, status of execution of its components and design options	Within one month of the issuance of the work order
Monthly/Quarterly Progress Report and other interim Progress Report	Report of the preceding month to be submitted within two weeks of the next month or as directed by the

<p>Monthly/Quarterly Procurement Report</p> <p>Bid evaluation Report as applicable</p>	<p>Project Director</p> <p>Report of the preceding month to be submitted within two weeks of the next month or as directed by the Project Director</p> <p>To be done within the stipulated time period as applicable following the procurement norms of the World Bank</p>
<p>Compendium of training material for the employees of Client and the beneficiaries as applicable</p>	<p>To be submitted within the time frame to be fixed up by the Project Director</p>

12.2 The Consultant shall also maintain the following records and make them available for inspection / audit by the client or the World Bank at any given point of time:

12.2.1 Materials and works test certificates

12.2.2 Minutes of various meetings involving the PMC.

12.2.3 Non-compliance and infringement notices in respect of the laws and regulations, especially in respect of:

- Compensation for damages to property
- Occupational Health and Safety including workers compensation
- Environmental protection measures for construction activities

12.2.4 Site instructions / observations after inspection made by Client/PMC.

12.2.5 Claim documentation and payment certificates of the vendors

12.2.6 **“As Executed”** drawings and records of the works.

- I. Further the PMC shall deliver a basic reporting system of MIS and Web-GIS based WRIS for the Project within **4 (four) months** from the date of issuance of the work order.