Government of the People's Republic of Bangladesh
Local Government Engineering Department

Environmental and Social Management Framework for

Resilient Infrastructure for Adaptation and Vulnerability Reduction (RIVER) Project

Part –II (Annexures)

December 2021

List of Annexures:

Annex -A: Sample Checklist for Environmental and Social Screening of Sub-Projects

1. Sub-project Description

Package Name and Number:			
Name of the Sub-project/component:			
Educational Institute ID/ Road ID:			
Estimated total Cost of the sub-project/component (in Taka):			
Estimated Operation and Maintenance Period (Sub-project life time):			
Division:	District:	Upazila:	Union:
Name of the community/ Local area:			
Size of the local population:			
Major profession of local population:			
Distance of the site from Upazila HQ:			
Nearby Major Road:			
Nearby River/ Canal:			
Description of proposed sub-project activities (incl. type of activities, footprint area, natural resources required, etc.):			
Brief description of sub-project site: (e.g. present land use, Important Social and Environmental Features (IEFs) near site, etc.)			
Types of waste to be generated during construction and operation phase:			
Sensitive environmental, cultural, archaeological, religious sites near (within 1km) of site including major water bodies/forests:			

Instructions: Attach completed environmental and social screening forms with this form.

2. Environmental and Social Screening Form

Section A: Sub-project Overview

Description of sub-project/component interventions:
Sub-project Location:
Expected construction period:
Description of project intervention area and project influence area with schematic diagram (where relevant, indicate distance to sensitive social and environmental areas such as archeological/religious/ historical or cultural assets or sites, human settlements, forests, water bodies, etc.):

Section B: Social and Environmental Screening Checklist

Screening Questions	Y	N	Impact Scale[1]				Remarks
			L	M	S	H	
A. Sub-project Sitting/ Location Is the Sub-project area……. ▪ Adjacent to/or within any of the social/environmentally sensitive areas?							
• Cultural heritage site							
• Ethnic minority areas							
• Protected Area							
• Wetland							
• Mangrove							
• Estuarine							
• Buffer zone of protected areas							
• Special area for protecting biodiversity							
• Bay							
▪ Are there any ponds, khals, beels, haors, baors, rivers, etc. in/around the site? Please specify numbers & names for each.							Nos. – Distance – Direction
							Ponds:
							Khals:
							Beels:
							Haors:
							Baors:
							Rivers:
							Other:
▪ Any sensitive sites for river erosion? Where &							

[1] Y = Yes, N = No, L=Low, M=Moderate, S=Substantial, H=High

Screening Questions	Y	N	Impact Scale[1]				Remarks
			L	M	S	H	
Severity?							
B. Baseline at Pre-Construction Stage							
Ancillary Facilities (e.g. status of access road or any other facility required for sub-project to be viable) ?							
Air quality status (apparently/ visibly)?							
Requirement of accommodation or service amenities (toilet, water supply, electricity) to support the workforce during construction?							
Possible location of labor camps?							
Requirement and type of raw materials (e.g. sand, stone, wood, etc.)?							
Identification of access road for transportation?							
Location identification for raw material storage?							
Possible composition and quantities of wastes (Solids wastes, demolition materials, sludge from old latrines, etc.)?							
Mention source of drinking water in dry and wet seasons.							Shallow / Deep Tube well If Deep tube well, mention depth: Feet = If other, Specify: Rainwater harvesting available: onsite / off site / NA
Has the sub-project/component site any seismic risk (historically)?							
Identification of possible stakeholders, esp. vulnerable groups?							Description:
C. Potential Socio-environmental Impacts Will the Sub-Project cause…							
▪ Potential influx of workers to the project location? Whether significant for the local community?							
▪ Possible conflict between workers and local people?							
▪ Resource constraint for the local population (due to the additional burden of incoming workers/staffs)?							

Screening Questions	Y	N	Impact Scale[1]				Remarks
			L	M	S	H	
▪ Possible loss of agricultural land/ crops?							
▪ Involvement of any land acquisition and involuntary resettlement?							
▪ Loss of business or enterprises due to land requisition/acquisition?							
▪ Loss of income sources and means of livelihoods due to land acquisition/ requisition?							
▪ Impacts on any vulnerable (poor, old-aged, female-headed households, ethnic people, etc.) people?							Detail out about the groups and how is impacted.
▪ Loss of access to natural resources, communal facilities and services?							
▪ Impacts on social and economic activities due to the change in land use (if any)?							
▪ Cutting trees for construction works of with more than 3" girth diameters?							Species name & Number of trees:
▪ Impact on pond or fish population or aquatic habitats?							
▪ Any surface water pollution? If yes, Source?							
▪ Any Groundwater pollution? If yes, Source?							Fe---As---Mn---Hard[2] If other, Specify: Contaminant's depth (ft): (Shallow / Deep)
▪ Possible contamination of surface and ground waters due to improper waste disposal:							
▪ The type and quantity of waste generated (e.g. Solids wastes, liquid wastes, etc.):							
▪ Impacts on surrounding environment due to sanitation and solid waste disposal: (Briefly mention the sources and extent of impacts)							Disposal area available? Yes/No If yes, where & how:
▪ Impacts from construction camp?							Camp area available? Yes / No If yes, where? onsite / off site
▪ Disturbance or modification of existing drainage channels (rivers, canals) or surface							Water logged for (days):

[2] Fe=Iron, As = Arsenic, Mn = Manganese, Hard = Hardness

Screening Questions	Y	N	Impact Scale[1]				Remarks
			L	M	S	H	
water bodies (wetlands, marshes)?							Water height:
▪ Destruction or damage of terrestrial or aquatic ecosystems or endangered species directly or by induced development?							
▪ Flooding problem in the area? Mention frequency & severity							Year – Height - Days
▪ Traffic disturbances due to construction material transport and wastes?							
▪ Possibility of sub-project induced air / dust pollution? Mention the sources and impacts.							
▪ Noise pollution from construction, industrial, vehicles?							
▪ Risks and vulnerabilities related to occupational health and safety due to hazards during construction and operation phase?							
▪ Negative effects on neighborhood or community (Mention types and scale of impacts)?							
▪ Degradation or disturbance of historically, culturally important site (mosque, graveyards, monuments etc.)?							
▪ Any Impediments to movements of people and livestock during construction period?							
▪ The shelter building need to relocate/ Shift to another place? ▪ If yes, Mention Relocation place name, distance from site, for how long, is rent needed? Show relocation place in the topographical map.							
▪ Disturbance to the student in taking the lesson in the classroom?							
▪ Direct or indirect hazards to student for walking in the school campus by construction activities?							

Screening Questions	Y	N	Impact Scale[1]				Remarks
			L	M	S	H	
▪ Is there any disaster early warning system? If Yes, by Whom?							Yes: Available; UDMC, Miking, TV, TNO, TEO, Red crescent, Mobile phone SMS etc.

Table 3: Important Establishments and boundary village/ river around the Sub-project site

Direction	Important Establishments	Village/ River
North side		
South side		
East side		
West side		

Table 4: Total Trees found inside the school area/ along the road length /surrounding the site, (those need to be removed)

	Nos.	Tree name/ Species
Small		
Medium		
Big		

Table 5: Pond/ Water bodies found inside and adjacent to the sub-project area:

	Nos.	Size (ft x ft)	Depth (ft)	Fish Firming (Yes or No)	Name of Firming Fish	Use of pond (Domestic/ Bathing / other)
North						
South						
East						
West						

Indigenous, brackish water and endangered fish species exist in catchment area of the Sub-project: Yes or No. If yes, Mention Name:

The common local birds found in the catchment area:

Wild animals found in the catchment area:

Endangered faunal species found in the catchment area:

The soils are highly / moderately / not saline at a depth of ft in and around the sub-project areas throughout the year.

Location of borrow/excavated/collection area where from soil are collected for raising land:

Whether Soil collected from any known polluted areas (solid/faecal waste dumping area, polluted industrial area, sediment beneath a polluted water, etc.): *(pls. explain with apparent quality of soil)*

Climate Change Consideration:

Whether the climate change mitigation/adaptation measures have been considered for the subproject (highest flood level consideration, Free board design of road, greenhouse gas emission etc.)

Table 6: Significant features of the Sub-project

Owner of land	:	
Land available	:	Decimal (ft x ft)
Structural Design Option	:	
Tribal people	:	
Connecting Road	: Existing:	;No= ,New road is needed length=
Land acquisition	:	

Social risks/challenges that might affect project or sub-project success:

Conducted (previously) Consultation events with affected communities/people and summary of consultation (including methods):

Issues Raised by the Participants and their Recommendations during FGD (current events):

Table 7: Environmental and Social Screening Summary

Please summarize the results of environmental and social screening conducted above. Mitigation measures need to be proposed in referenced to ESMP Guidelines relevant to the type of the sub-project, proposed in relevant sections of ESMF. This table needs to be completed by both environmental and social specialists. Please add rows to the table as necessary.

Section	Main Environmental and Social Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicators	Frequency
1: Sub-Project Location						
2: Pre-construction Phase						
3: Construction Phase						
4: Operational Phase						

* Overall Impact Score: Very High =Likely to cause widespread, long-term and irreversible impacts; High= Likely to cause long-term impacts; Moderate = Likely to cause site-specific temporary impacts; Low = Likely to cause little, short-term impacts

Table 8: Road identification and catchment area (for road sub-project only)

Name of the unions and upazila the road passes through	
Name of the road side villages	
Starting and ending point of the road (with geo-coordinates)	
Year of construction/ Last maintenance	
Highest Flood Level (HFL) of road surrounding areas (feet)	
Major components of the works that included in BOQ (Earthwork, Slope Protection work/ Grass Turfing, WBM work, Dense carpeting, Boundary wall, Retaining walls, Road Safety works, Tree Plantation, Bridge, Box Culvert, Pipe Culvert etc.)	

Table 9: Detailed features along the road length (for Road Sub-projects only)

Chainage (m)	Width (ft)	Left	Right	Socioeconomic and Environmental Features (with distance from the centerline of the road)

Overall risk classification: a) Low; b) Moderate; c) Substantial; d) High Rationale/Due Diligence Note: For Moderate risk ESA/IEE and ESMP will be prepared and for Low-risk project ESMP will be prepared. Recommendation for further environmental and social assessment and/or site specific environmental and social management plan: Yes/No, Substantial and High -risk projects will be excluded from further consideration. **If yes, please specify what assessments/plans wwould be required.*	
Completed by : (Name, designation, mobile number)	(signature, date)
Reviewed by :	

(Name, designation, mobile number)	(signature, date)

Annex -B: Structure of Environmental and Social Assessment

Conducting Sub-project Screening and preparing an Initial Examination (IEE) Report for every sub-projects constitute the procedure of Environmental and Social Assessment (ESA) that describes the process of analysis and planning (used by a World Bank Borrower) to ensure that the environmental and social impacts and risks of a project are identified, avoided, minimized, reduced or mitigated.

The ESA needs to meet the requirements of the World Bank's Environmental and Social Standard (ESS) 1. Based on the requirements of ESS Section B, the recommended structure of the ESA is as follows:

1. Introduction – description of project background and objectives
2. Sub-Project Description – components, locations, cost estimate, implementation plan
3. Summary of Sub-Project's Technical Analyses
4. Description of Sub-Project Area – baseline environmental (physical and biological) and socioeconomic condition
5. Scoping of Potential Environmental and Social Issues – based on project description and baseline conditions, range and extent of potential issues should be described. Initial consultations with key stakeholders can be useful for the scoping exercise.
6. Stakeholder Engagement - consultation with affected people and other interested parties to potentially significant environmental and social risks and impacts are identified
7. Additional Assessment Requirements - Identification of specific assessment tools to carry out the environmental and social assessment and to document the results of such assessment, including the mitigation measures to be implemented. These can include Initial Environmental Examination(IEE) or Environmental and Social Impact Assessment (ESIA), Hazard or Risk Assessment, Cumulative Impact Assessment, Social and Conflict Analyses, Environmental and Social Management Plan (ESMP), Environmental and Social Management Framework (ESMF), Strategic Environmental and Social Assessment (SESA)
8. Institutional Capacity – description of strengths and weaknesses of implementing agency's environmental and social safeguards track record, capacity and training requirements.

Annex -C: Procedures of Environmental and Social Assessments

Environmental and Social Assessment (ESA)/Initial Environmental Examination (IEE)

An IEE, a type of ESA study, is normally carried out at the early stage of project planning and is used to identify and estimate the potential environmental impacts from the project activities. IEE is normally done within a short time duration based on preliminary information that is readily available through environmental reconnaissance. The general objective of an IEE is to examine all environmental parameters that are likely to be affected by the identified project activities, and to determine the degree of the adverse impacts that are likely to affect them (the environmental parameters). IEE is intended to provide first-hand information about the environmental parameters likely to be influenced by the project activities and the magnitude of the adverse impact in order to allow decision makers to ascertain whether a detailed EIA is needed. IEE will not make detailed evaluation of the environmental parameters but instead provide a basis for need to undertake detailed evaluation.

The ESA/IEE study will be conducted under LGED. However, according to the project planning, the activities those need IEE will be implemented at different periods and hence, multiple IEEs will be required clustering the similar activities prior to the actual intervention starts. The purpose of the conducting an IEE is three folds:

(i) to obtain Clearance from DoE and obtaining decision from DoE whether the particular project activities need further assessment such as detail ESIA or not;
(ii) provide/finalize the ToR for the ESIA study, if required; and
(iii) continue consultations with project stakeholders.

The Process of IEE is briefly outlined below:

Analysis of the Project Components: All the components of each sub-project, like construction and rehabilitation works, will be examined thoroughly, which will in fact guide the development of checklist for reconnaissance survey.

Preparation of Checklist: A comprehensive checklist of potential environmental components likely to be impacted need to be prepared based on the guidelines of different agencies such as DoE and World Bank.

Initial Screening/ Survey: Not all the parameters selected in previous step may be significant for the sub-project; hence the first activity will be to shorten this list to concentrate on significant effects. Data should be collected from all possible secondary sources, if available, and conduct an environmental reconnaissance with the relevant checklist in hand to identify and delineate the significant effects of the sub-project and eliminate the others from further considerations. Public consultation will play an important role in initial screening.

Analysis of alternatives: Alternative site and technological design should be analyzed for the proposed project interventions considering environmental, social, and technological criteria.

Identification and Scaling of Impacts: All the potential short and long term environmental impacts should be identified. The impacts can be graded qualitatively (e.g. high, substantial, moderate, and low) in order to identify major impacts and relevant components. In addition, cumulative and residual impacts of the project interventions need to be clearly addressed.

Identification of Enhancement and Mitigating Measures: From literature survey and applying expert judgment and based on assessed impacts, a list of possible enhancement and mitigating measures for beneficial and adverse effects respectively should be prepared.

Preparation Environmental Management and Monitoring Plan: Environmental and Management Plan for the proposed project should be prepared mentioning the impact mitigation/ enhancement

measures with institutional responsibilities. Also, environmental monitoring plan should be prepared that will include monitoring parameters, frequency, method and responsible agencies.

Recommendations on the need of ESA study: The IEE study should recommend the activities and sub-projects as to whether a full-scale ESA study (ESIA/EIA) is needed or not.

A tentative IEE report structure is suggested as follows:

Table: Table of Contents of an IEE Report

Chapter	Sub-chapters required in IEE report
Chapter-1	Introduction
Chapter-2	Description of the project
Chapter-3	Description of the existing background environment in and around the sub-project site (Generally this should cover an area of 1 km. Radius)
Chapter-4	Potential significant impacts (During Pre-construction, Construction and Operation Phases)
Chapter-5	Mitigative, abatement and enhancement Measures
Chapter-6	Residual impacts if any (these may have to be studied at the detailed Assessment stage)
Chapter-7	Monitoring Project
Chapter-8	Summary and Conclusions

Source: EIA guidelines for industries, 1997, DoE, Bangladesh

Annex -D: Sample Mitigation/Enhancement measures during different Phases of a Sub-project

Guidance on possible environmental and social mitigation and enhancement measures for different phases of a sub-project is given below, which will be adopted in congruence with the site-specific situation, available technologies, resources and institutional capacity of a project.

Issues/ Activities	Potential Environmental and Social Impacts	Proposed Mitigation Measures	Responsibility	
			Implementation	Supervision
Pre-Construction Phase				
Land Acquisition/ Requisition	• Encroachment of agricultural land, cultural sites, fish habitat etc. • Loss of agricultural production, fish resources; • Loss of income and livelihoods; • Social conflict.	– Avoid all types of acquisition or requisition of land for any types of sub-projects; if any land required for temporary use of the sub-project (esp. for labor shed, construction material yard, site office, or so on), contractor must rent the suitable land under a proper tenancy agreement which will be endorsed by Social Development Specialist of PIU. – Avoid agricultural land, social/religious institutes, fish habitat during finalization of the alignment of the connecting road and location of any other types of sub-projects; – Adequate compensation should be given for standing crops, if damaged by contractor for any use or actions, under the reconciliation in presence of district XEN, Upazila Engineer, Social Development Specialist, and the affected person. – Avoid agricultural land, in all cases; – Create job opportunities for the PAPs.	PIU	D&SC/PIU
Loss of vegetation/ tree	• Accident risk during removal of trees/vegetation's in the project sites; • Birds and others species can migrate from the trees/vegetation's; • Impacts on the local climatic condition.	– Prior to start construction, all vegetation should be removed from the proposed construction sites with the consultation of the local relevant authorities; – Avoid disturbance and careful during construction vehicle and equipment movement; – Proper H&S measures (use of appropriate PPE such as hand gloves, safety shoes and helmet) for the workers should be taken during removal of trees, bushes & crops; – To mitigate the ecological impact, tree plantation plan can be considered in the design & accordingly tree plantation will be done in an appropriate location to be determined by the D&SC after consultation with the concerned authority;	Contractor	D&SC/PIU

		– The engineer shall approve such felling; only when the proponent secures receive a "clearance" for such felling from the PIU, as applicable; – Tree felling, if unavoidable, shall be done only after compensatory plantation of at least three saplings for every tree cut is done; – Tree plantation at the suitable locations after completion of the construction activities.		
Removal of Utilities	• Vulnerable for workers health and safety; • During movement of heavy Construction machineries equipment's can damage the utility services if not previously removed; • Due to carelessness or incautiousness death from sudden electric shocks may occur.	– Prior to start construction, the utility services (electrical cables, telephone line, water supply pipeline, gas supply pipeline and internet line) should be shifted with the consultation of the relevant organizations; – Inform the local community before starting removal or demolishing work; – Carefully remove the utilities that are connected to any structures; – Proper Health and safety measures for the workers should be taken during shifting of these lines to avoid any incidents.	Contractor	D&SC/PIU
Dismantling	• Dust pollution in the construction site; • Health hazard for the workers and community during dismantling works; • Noise level increase; • Vibration effects on the structures on the surrounding of the project area; • Surface water contamination, blockage of navigation and	– Notify the adjacent community before starting the demolishing work; – During the removal or demolition of existing structures if required will be fully removed by the contractor; – Spraying of water in the dry land or from where there is a possibility to generate dust; – Banned fishing, swimming, boat movement activities in the construction sites, if applicable; – Proper H&S measures for the workers such as using of appropriate PPE (helmet, Earplug, musk, safety shoes, hand gloves etc.) should be taken to avoid any accidents; – Construct noise barrier around the dismantling site; – Stop the engine when it is not required; – Monitor Noise level as per DoE guidelines; – Impact wise mitigation measures are given.	Contractor	D&SC/PIU

	drainage, impacts on aquatic animal;			
Archaeological/ Historical/ Social/ Cultural/ Religious Sites	• Encroachment of Archaeological/ Historical/ Social/ Cultural/ Religious sites • Air and dust pollution; • Noise level may create uncomforting for the local community; • Vibration can effect on social/ cultural/ religious site.	– Follow best management practice at Archaeological/Historical/Social/Cultural/ Religious sites during the safety improvement works; – Spraying water on the dry surface to reduce dust pollution; – Vehicles transporting construction material to be covered; – Create noise barrier around the construction sites; – Limit the speed of vehicles; – Stop the construction work for short time like prayer time.	Contractor	D&SC/PIU
Labour management	• If labour management plan is not prepared /followed then working environment will degrade	– Labour management plan (LMP) is required to be developed for the project/sub-project – Confirm that implementation of LMP is specifically incorporated into the contract documents either as clause or by appending the LMP along with the ESMP to the contract documents.	Contractor/ D&SC	PIU
Setting up labour camps	• Land encroachment; • Solid and liquid waste from the labour camp	– Labour camp should be constructed at a distance from the water bodies; – Avoid productive land and away from the settlement during the selection of land for the setup of labour camp; – No solid and liquid waste discharge into the water bodies; – Instruct workers to maintain clean environment in the camps.	Contractor	D&SC/PIU
Construction Phase				
Air Pollution	• Construction vehicular traffic: Air quality can be affected by vehicle exhaust emissions and combustion of fuels • Construction equipment: Air quality can be adversely affected by emissions from construction machineries and	– Fit vehicles with appropriate exhaust systems and emission control devices; – Maintain vehicles and construction equipment in good working condition including regular servicing; – Operate the vehicles in a fuel-efficient manner; – Impose speed limits at 30 km/hour on vehicle movement at the worksite to reduce dust emissions; – Control the movement of construction traffic in the access road; – Focus special attention on containing the emissions from generators; – Construction equipment causing excess pollution (e.g., visible smoke)	Contractor	D&SC/PIU

	combustion of fuels; • Construction activities: Dust generation from earth excavation, earth & sand stockpiles during dry period.	will be banned from construction sites immediately prior to usage; - Water spray to the dry earth/material stockpiles, access roads and bare soils as and when required to minimize the potential for environmental nuisance due to dust; - Increase the watering frequency during periods of high risk (e.g., high winds); - Stored materials such as: excavated earth, dredged soil, gravel and sand shall be covered and confined to avoid their wind drifted; - Restore disturbed areas as soon as possible by vegetation; - Establish adequate locations for storage, mixing and loading of construction materials, in a way that dust dispersion is prevented because of such operations; - Use temporary barriers to control dust around the construction sites near the populous residential areas - The Air quality monitoring should be carried out by the contractor following the National Air Quality Standard (Schedule-2: Standards for Air Quality, ECR, 1997 and Amendment in 2005).		
Noise Pollution	• Construction vehicular traffic: Vibration and Noise quality will be deteriorated due to vehicular traffic. • Construction equipment: Noise and vibration will have an impact on adjacent surrounding residents. • Construction activity: Noise will have an impact on adjacent residents.	- Strict measures for noise pollution control need to be undertaken during construction activities; - Create noise barrier and consider the minimum noise levels at sensitive receptor sites (e.g., dense residential area, schools, mosques, health centers etc.); - Stone breaking machine should be confined within a temporary shed so that noise pollution could be kept minimum; - Protection devices (ear plugs or ear muffs) shall be provided to the workers operating in the vicinity of high noise generating machines during construction; - Construction equipment and vehicles shall be fitted with silencers and maintained properly; - Instruction to the drivers to avoid unnecessary horn; - The Noise level monitoring should be carried out by the contractor following the National Noise Quality Standard (Schedule-4: Standards for Sound, ECR, 1997 and Noise Pollution (control) rules 2006). - Vibration monitoring should be carried	Contractor	D&SC/PIU

		out by the contractor. - The contractor shall be responsible for repairing any damage caused as a result of vibrations generated from or by the use of his equipment, plant.		
Groundwater Pollution	• Contamination of groundwater due to Pollution lack of septic tanks or mobile toilets; • Accidental spillage of hazardous liquid from the construction camps.	- The contractor will make arrangement for water required for construction in such a way that the water availability and supply to nearby communities remain unaffected; - Handling and storage of the potential contaminants has to be organized under strict condition to avoid water pollution during construction; - Handling of hazardous liquid should be done carefully by the designated experienced person; - Handling and storage of the potential contaminants should be done by the experienced workers. Proper monitoring should be done by the experienced person; - The groundwater quality monitoring should be carried out by the contractor following the National Water Quality Standard (Schedule-3: Standards for Water, ECR, 1997).	Contractor	D&SC/PIU
Surface Water Pollution	• Construction & general wastes from the construction sites; • Oil spill from the construction vehicles and construction camp can effect on fishes and aquatic wildlife (such as snakes, frogs etc.)	- Contractor should prepare Waste Management Plan and follow it properly during the construction period; - Any wastes should not be throwing into the river/khal/canal other than dump into the designated waste dumping area; - Store the oil and petroleum product in a separate location cover by a concrete structure; - Handling of hazardous liquid should be done carefully by the designated experienced person; - Monitor the surface water by testing in designated laboratory should be done by the Contractor following the National Water Quality Standard (Schedule-3: Standards for Water, ECR, 1997).	Contractor	D&SC/PIU
Land/ Soil Pollution	• Decrease the production capacity of agricultural land; • Land or soil erosion from water or wind; • Sediment pollution and increase the turbidity;	- Avoid the productive land, agricultural land, archaeological sites, protected area, forest area, natural habitat etc.; - Land/soil quality should be ensured by the contractor to fill the abutment area and approach road; - Re-vegetation the exposed area as early as possible to reduce the soil erosion; - Create barrier for reducing the sedimentation into the water bodies;	Contractor	D&SC/PIU

	• Reduction the microorganism.	– The Land or soil quality test should be carried out by the contractor.		
Waste (Solid, Liquid and Hazardous) Pollution **Organic waste: remaining foods, leafs, papers, straw, fruit cover etc.** **Inorganic waste: Polythene, Glasses, Synthetic paper, plastic etc.** **Hazardous waste: Paint, fuel, chemicals, oil, petroleum products, bitumen etc.**	• Improper storage and handling of construction & general liquid waste such as fuels, lubricants, chemicals and hazardous liquid onsite, and potential spills from these liquid materials may harm the environment and health of construction workers. • Improper storage and handling of construction & general solid wastes.	– The contractor will minimize the generation of sediment, oil and grease, excess nutrients, organic matter, litter, debris and any form of waste (particularly petroleum and chemical wastes); – Any wastes should not be throwing into the river/khal/canal other than dump in to the designated waste dumping area; – Handling of hazardous liquid should be done carefully by the designated experienced person; – Organic waste should be managed by composting method. A concrete chamber with 3 rooms is needed to be provided. In one room organic waste should be dumped and another room inorganic waste will be dumped. When the room will be filled then covered by earth. Then dump to the third room. After 6-month organic waste will be converted into fertilizer and will be used by the farmers; – Inorganic waste should be given to the authorized vendor for free of cost for recycling; – Accidental spillage of hazardous waste should be managed by spreading wood powder on the surface of the oil and this powder mixed with oil must store in a designated concrete room; – Provide appropriate PPE to the construction personnel for handle construction materials; – Make sure all containers, drums and tanks that are used for storage are in good condition; – Take all precautionary measures when handling and storing fuels and lubricants, avoiding environmental pollution; – Waste water monitoring should be carried out by the contractor, following the national standard (Schedule-10: Standard for waste from Industrial units or Projects waste).	Contractor	D&SC/PIU
Drainage Congestion	• Stockpiling of construction materials in the river/khal/canal also create drainage congestion.	– Immediately remove all the construction debris from the construction site as well as from the water bodies in a planned way; – Duration of stockpiling should be minimized as much as possible; – Avoid the encroachment of the water bodies; – Protect water bodies from sediment	Contractor	D&SC/PIU

		loads by silt screen or bubble curtains or another barrier; - Regularly inspect and maintain all drainage channels to assess and alleviated any drainage channels to assess and alleviate any drainage congestion problem - Construction activity should be recommended during the dry season; - Construction workers shall be instructed to protect water resources;		
Road Traffic and Accidents	• Increased traffic use of narrow access road by construction vehicle will affect the movement of normal road traffics and the safety of the road users specially the students	- Proper Traffic Management Plan (TMP) should be prepared by the contractor during starting of construction & follow it strictly; - In this TMP, the road safety measures such as speed breakers, visible warning signs/lights in Bangla and English, road safety signs, flagman etc. should be included to ensure uninterrupted traffic; - Movement specially at nearby the educational (Schools, colleges, Madrasha etc.), community infrastructure (mosques, graveyards, Prayer Ground etc.) and health complex; - In addition, BRTA traffic rules and regulations should be strictly followed; - Divert traffic to follow alternative routes to avoid traffic jams; - Avoid talking with mobile during driving.	Contractor	D&SC/PIU
Landscape and Aesthetics	• Presence of construction camps, equipment and their activities; • Movement of construction vehicles on the existing road network and temporary haul roads;	- Parking of construction vehicles and stockpiling of construction materials/excavated earth should be done in systematic way to avoid the damaging of aesthetics of the site; - Duration of stockpiling should be minimized as much as possible; - Vegetation plantation after complete of the construction work; - Completely remove the construction camp facilities, equipment's and their activities; - Limit the speed of the vehicles and cover the vehicles during the movement or transportation of materials on the existing road network and temporary haul road; - Plantation of trees at the construction site after completion of the construction activities immediately.	Contractor	D&SC/PIU
Occupational Health and Safety	• Campsites for construction workers and Safety are the important	- Construction workers camp shall be located at least 500 m away from the nearest habitation; - Consider the location of construction camps away from communities in	Contractor	D&SC/PIU

	locations that have significant impacts such as health and safety hazards on local resources and infrastructure of nearby communities.	order to avoid social conflicts; - Create awareness among the camp users on health and safety requirements to be maintained and code of conduct; - Implement OHS measures as per LMP and inspect regularly as per the guideline given in Annex H.		
	• Lack of proper infrastructure facilities, such as housing, water supply and sanitation facilities will increase pressure on the local services and generate substandard living standards and health hazards	- Adequate housing for all workers should be provided avoiding over crowing; - Safe and reliable water supply; - Hygienic sanitary facilities and sewerage system; - Implement OHS measures as per LMP and inspect regularly.	Contractor	D&SC/PIU
	• Management of wastes is crucial to minimize impacts on the environment.	- Ensure proper collection and disposal of solid wastes within the construction camps; - Insist waste separation by source; organic wastes in one container and inorganic wastes in another container at sources; - Dispose organic wastes in a designated safe place on daily basis; - The organic wastes should be always covered with a thin layer of sand so that flies, mosquitoes, dogs, cats, rats, etc. are not attracted; - Locate the garbage pit/waste disposal site minimum 500m away from the resident area so that people are not disturbed with the odor likely to be produced from anaerobic decomposition of wastes at the waste dumping places.	Contractor	D&SC/PIU
	• There will be a potential for diseases to be transmitted including malaria, exacerbated by inadequate health and safety practices. • There will be an	- Provide adequate health care and sanitation facilities within the construction sites; - Train all construction workers in basic sanitation and health care issues and safety matters and on the specific hazards of their work; - Provide HIV awareness project ming, including STI (sexually transmitted infections) and HIV information, education and communication for all	Contractor	D&SC/PIU

	increased risk of work crews spreading sexually transmitted infections and HIV/ AIDS.	workers on regular basis; - Regular mosquito repellant spraying during monsoon periods.		
	• Construction work may pose health and safety risks to the construction workers and site visitors leading to severe injuries and deaths.	- Provide the workers a safe and healthy work environment; - Provide appropriate PPE for workers, such as safety boots, helmets, masks, gloves, protective clothing, goggles, full-face eye shields and ear protection; - Maintain the PPE properly by cleaning dirty ones and replacing them with the damaged ones; - Appoint an environment, health and safety manager to look after the health and safety of the workers; - Inform the local authorities responsible for health, religious and security before commencement of civil works and establishment of construction camps so as to maintain effective surveillance over public health, social and security matters.	Contractor	D&SC/PIU
	Lack of first aid facilities and health care facilities in the immediate vicinity will aggravate the health conditions of the victim.	- Provide health care facilities and first aid facilities are readily available; - Document and report occupational accidents, diseases, and incidents and actions taken; - Identify potential hazards to workers, particularly those that may be life threatening and provide necessary preventive and protective measures; - Provide awareness to the construction drivers to strictly follow the driving rules; - Provide adequate lighting in the construction area and along the roads in the construction site.	Contractor	D&SC/PIU
Community Health and Safety	• Accidents on the approach road and construction site; • Noise and dust pollution; • Communicable diseases can spread among the local community.	- Prior to start the construction activities contractor will be informed the local community; - Instruct the drivers and limit the speed of the vehicles; - Regular health checkup of the workers and awareness training about the communicable diseases; - Ban all swimming and fishing activities in the construction site, in case of a bridge site; - Proper lighting at the project site	Contractor	D&SC/PIU

		during the night time; - Avoid unnecessary noise pollution; - Spraying water in the dry surface to reduce the dust pollution - Provide proper access control to the project site and unauthorized entry to the project site will be controlled by deploying security personnel.		
Impacts on Archaeological/ Historical/ Social/ Cultural/ Religious Sites	• Air and dust pollution; • Noise level may create uncomforted; • Vibration can effect social/ cultural/ religious sites.	- Create temporary barrier around the project site; - Regular spraying of water in the construction site and approach road to reduce the dust emission; - Control the speed limit about 30 km/hour in the construction site and approach road; - Construction activities should be continued during day time only; - Religious norms of the respective sites should be maintained - Carefully handling of construction machineries and equipment's near the sensitive receptors near the project site.	Contractor	D&SC/PIU
Housing and Commercial Structures	• Air and dust pollution; • Noise level may create uncomforted; • Mental stress; • Vibration can effect on structures.	- Spraying water on the dry surface to reduce dust pollution; - Create noise barrier around the construction sites; - Limit the speed of vehicles in the construction site; - Prior notice to the local inhabitants for resettlement issues if required; - Compensation should be given to the PAPs in-time according to RAP; - Realignment of approach road if required; - Job opportunities for the PAPS and priority should be given; - Plantation of trees in an appropriate location will be determined by the D&SC after consultation with the concern authority (Forest Department).	Contractor	D&SC/PIU
Flora and Fauna	• Dust will be generated during earthwork and deposited on the leaves of nearby trees; this will abduct the growth of trees. • Noise generation from the construction vehicles and equipment's can create	- Proper construction management plan should be introduced in the Contractor construction sites; - Regular water spraying in the dry area from where there is a possibility to dust pollution; - Proper management plan for the waste management in the construction sites; - Construction work should be preferred during dry season; - No disturbance for aquatic animal and keep provision for the fish movement; - Diversion road should be removed properly as soon as possible;	Contractor	D&SC/PIU

	disturbance for the birds and wildlife;	– Construction activities should be continued during day time only; – Create noise barrier and avoid unnecessary machineries and equipment's operation; – Vegetation plantation after compilation of the construction work; – Construction workers shall be instructed to protect natural resources, flora and fauna, including wild animals and aquatic life, hunting and unauthorized fishing are prohibited; – Natural river/khal/canal will be reinstated after completion of construction works;		
Disturbance to Wildlife Movement	• Noise from construction machineries and vehicles, movement of workers likely to be disturb the movement of wildlife; • Permanent migration may occur from the area; • Increase of mortality due to collision with vehicles;	– Instruct workers and contractors to avoid harassment and disturbance of wildlife; – Schedule activities to avoid disturbance of wildlife during critical periods of the day (e.g., night) or year (e.g., periods of breeding, nesting); – Turn off all unnecessary lighting at night; – Maintain noise-reduction devices (e.g., mufflers) in good working order on vehicles and construction equipment; – Temporary fencing around the construction site during construction period; – Educate workers regarding the occurrence of important resources in the area and the importance of their protection, including the appropriate regulatory requirements; – Regular monitoring of the death and disturbance of wildlife in the construction site.	Contractor	D&SC/PIU
Fisheries and other Aquatic Animals	• Increase turbidity and siltation can spawning beds for fish; • Noise from pile driving activities, aquatic animals including fishes will be affected; • Turbid water can reduce the infiltration of sunlight into deep water.	– Construction activities is preferred during the dry season; – Careful handling of construction waste in the construction site; – Introduction of land/soil erosion and dust control practices in the construction site; – Provide adequate space for movement and safe passage of fishes and other aquatic animals; – Schedule activities to avoid disturbance of fish and aquatic anima during critical periods of the day (e.g., night) or year (e.g., periods of breeding); – Turn off all unnecessary lighting at night to avoid attracting and disturbance of fishes; – Maintain noise-reduction devices (e.g.,	Contractor	D&SC/PIU

		mufflers) in good working order on vehicles and construction equipment; - Regular monitoring the fish death and disturbance of fish and aquatic animals in the construction site; - Fingerling (fish) can be released to the river/khal near the bridge site to boost up the fish resources		
Influx of construction workers	• Availability on the resources like food, housing, water resources; • Communicable diseases may also spread; • Social Conflict.	- Contractor should be ensured the availability of water for the construction activities; - Provision of clean drinking water in the construction camp in accordance with Schedule 3(b) of ECR, 1997; - Trained the workers by providing health and safety training on communicable diseases; - Educating project personnel, and area residents on risks, prevention, and available treatment for vector-borne diseases; - No child and/or forced labour will be employed by the contractor (labor has to provide National ID before any engagement to work); - Working conditions and terms of employment will be fully compliant to the Bangladesh labour laws.	Contractor	D&SC/PIU
Operation Phase				
Air Pollution	• Dust emission from the increasing number of vehicles in the site area; • Vehicular emission from burning fuels.	- Establish the speed breaker to limit the speed of the vehicle near the site; - Strictly follow the BRTA rules and regulations; - Increase number of plantations by adding new species of trees on the appropriate locations after consultation with the concern authority.	LGED	LGED
Surface Water Pollution	• Remaining construction materials may be washed by the rainfall into the water sources and lead to sedimentation and increase turbidity; • Hazardous materials spilled by accidents; • Soil erosion during rainy season can contaminate nearby surface water.	- Remaining construction materials will be completely removed from the proposed project site after completing of the construction activities; - Cover the bare surface by plantation of trees/vegetation to reduce the surface soil erosion; - Speed control measures close to the site to reduce the occurrence of accidents; - Avoid rainy season for continuing any development activities. - Drainage and collection structures on the road project, particularly in areas near the river and irrigation canals, shall be designed such that spills of hazardous materials shall not result to contamination of these water courses.	LGED	LGED

Groundwater Pollution	• Accidental spillage of hazardous chemicals and materials.	− Speed control measures close to the site to reduce the occurrence of accidents; − Inform to the concern authority to take necessary action to reduce the contamination of groundwater.	LGED	LGED
Noise Pollution	• Faulty engine and hydraulic horn may increase the noise level.	− Necessary instruction for the drivers; − Establishment of signboard near the sensitive receptors like mosques, schools, temple, bazar etc.	LGED	LGED
Flora and Fauna	• Dust will hinder vegetation growth; • Increase number of deaths of wildlife and collision with the vehicles; • Avifauna will be affected by the movement of vehicles; • Fish and other aquatic animals will be affected.	− Re-plantation of various suitable local trees can be done on the slopes of the roads or the suitable locations around the project site; − Establishment of speed breaker or signboard indicating the movement route of the wildlife; − No disturbance for aquatic animal and keep provision for the fish and other aquatic animals' movement; − Diversion road should be removed properly as soon as possible; − Construction workers shall be instructed to protect natural resources, flora and fauna, including wild animals; − Natural river/khal/canal will be reinstated after completion of construction works; − Fingerling (fish) can be released to the river/khal/canal near the bridge site to boost up the fish resources.	LGED	LGED
Landscape and Aesthetics	• Land use of the proposed project area will be changed; • Improper removal of construction camp facilities and other construction waste will affect landscape and aesthetics.	− Tree/vegetation plantation at the suitable site; − Proper removal of construction camp facilities and construction wastes from the site after completion of the works; − Excavated borrow pit area will be properly managed by the contractor, it will be preferred to use dredging materials after quality testing.	LGED	LGED
Road Traffic and Accidents	• Number of vehicles movement will be increased in the area; • Encourage drivers to higher the vehicle speed and road accidents may increase.	− Enforce speed limits and impose penalties on the traffic violators − Establish road safety sign and appropriate traffic signs; − A proper traffic management plan can be introduced and strictly follow the BRTA rules; − Keep provision of adequate lighting facilities at the site; − Avoid using mobile phone during driving.	LGED	LGED

Annex -E: Sample for the Preparation of Environmental & Social Management Monitoring Plan

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Responsible for Execution	Responsible for Monitoring	Monitoring Suggestions	
						Indicators	Frequency
1. Sub-project Interventions	**Construction** of a climate resilient multi-purpose Resilient Flood shelter cum primary school (degradation of air, water and soil quality, and local hydrology)	Under the sub-project intervention the overall score is low	• Limiting earthworks. • Watering of dry exposed surfaces and stockpiles of aggregates at least twice daily, as necessary. • The earthwork sites where exposed land surface is vulnerable to runoff shall be consolidated and/or covered. • The material stockpile sites shall be far away from surface water bodies and areas prone to surface run-off. Loose materials shall be bagged and covered. • Channels, earth bunds, netting, tarpaulin and or sand bag barriers shall be used on site to manage surface water runoff and minimize erosion. • The overall slope of the work areas and stack yards shall be kept to a minimum to reduce the erosive potential of surface water flows elsewhere. • All precautions to store chemicals/oil/fuel properly so that no chance of spill. • Workers must specify waste dump locations to avoid littering which in turn	Contractor	Environmental and Social Development Specialists of PIU and D&SC	Visual monitoring result of air quality condition, Results of water test parameters, blockage of water flow with soil, debris or stack materials at site.	Throughout the time during the construction period.

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Responsible for Execution	Responsible for Monitoring	Monitoring Suggestions	
						Indicators	Frequency
			might negatively affect surface and ground water. • Monitor water quality according to the environmental management plan.				
2.Pre-construction Phase	**Site planning** (i.e. Labor camp, construction of material storage area etc.)	Under the sub-project intervention the overall score is low.	• The construction area is on a plain land. The entire construction area within the school boundary needs to be well fenced so that school children, teachers and others could be protected from any accidental events/injuries. Construction camp and material storage area should be located at the site & approved by the Environmental Specialist of D&SC.	Contractor	Environmental and Social Development Specialists of PIU and D&SC	Location of stockpiles and labor shed	Prior to the start of Construction works.
	Material storage area for construction (Creating dust/ air pollution, Spillage of liquid/ hazardous substances i.e. oil, paint, chemicals, bitumen etc., Risk of crime, Access of students, children, animals, etc.)	Under the sub-project intervention the overall score is low.	• The contractor shall submit a method statement and plans for the storage of hazardous materials (fuels, oils, and chemicals) and emergency procedures. • Proper procedure for stockpiling/ storage of construction materials at the site will be proposed by the contractor & approved by the Environmental Specialist of D&SC. • Proper covering of dust producing materials with polythene sheet, • Proper fencing around the storage area in order to be secure, to minimize the risk of crime and to be safe from access by	Contractor	Environmental and Social Development Specialists of PIU and D&SC	List of selected sites; Identified sources and storage places of materials.	Weekly visit during Design Stage

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Responsible for Execution	Responsible for Monitoring	Monitoring Suggestions	
						Indicators	Frequency
			students, children, animals, etc. • Spills/ hazardous substances should be disposed off at the site proposed by the contractor & approved by the Environmental Specialist of D&SC to avoid soil/ water contamination.				
	Demolishing of existing structure	Under the sub-project intervention the overall score is Moderate	• Water spraying at the demolition site • Fencing / Installing barriers should be shield from dust and aggregates • Avoid usage of machines/equipment with extra noise; • Do not accumulate and burn waste at the site • Carry out demolition activities in phases, give adequate notices and information of activities to the adjoining stakeholders • Identify proper location to dispose solid waste from demolition and other activities in consultation with respective bodies • Make mandatory the use of safety gears (helmets, safety belts, masks, gloves and boot) by workers depending on nature of work. • In addition, Contractor will prepare demolition plan beforehand and get approval from PIU.	Contractor	Field Resident Engineer, Environmental and Social Development Specialists of PIU and D&SC	List of selected sites; Identified sources of materials.	Daily visit during demolition

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Responsible for Execution	Responsible for Monitoring	Monitoring Suggestions	
						Indicators	Frequency
	Setting up of labor camp (Generation of sewage waste; solid Waste; Water, soil, air & dust pollution/ environmental pollution; health hazard of workers due to poor quality drinking water)	Under the sub-project intervention the overall score is low.	• Construction camp should be located at a site favorable for the workers and proposed by the contractor & approved by the Environmental Specialist of D&SC. • No trees, shrubs will be removed or vegetation stripped without the prior permission of the Environmental Specialist. • Under no circumstances may open areas or the surrounding bushes be used as a toilet facility. • Construction of sanitary latrine with septic tank for both male and female workers and staffs. • Construction of the first tube well for drinking water and providing water filters for further ensuring access to the safe drinking water. • Provision of waste bins/ cans, where appropriate, • Litter is to be collected daily. • Bins and/ or skips should be emptied regularly and waste/ debris should be disposed off at waste disposal areas and/ or at the site pre-approved by Environmental Specialist of D&SC. • Camp and working areas are to be kept clean and tidy at all times.	Contractor	Environmental and Social Development Specialists of PIU and D&SC	Complaints from community; Regular inspection of waste management activity; Waste disposal record.	Bi-weekly; Prior to the start of Construction works

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Responsible for Execution	Responsible for Monitoring	Monitoring Suggestions	
						Indicators	Frequency
	Accidents	Under the sub-project intervention the overall score is low.	• Provision of standard safety protocol. • Providing training on Environmental health and safety to the labors and associated field staffs is the responsibility of Upazila Engineer & Contractors. • Training should be scheduled twice, once before starting the construction & another in the middle of construction period. • Safety & protection gears, first aid box etc. should be available in the site during construction period.	Contractor	Environmental and Social Development Specialists of PIU and D&SC	Complaints from community and workers; update in Accident registry; Regular inspection of materials transport vehicles.	Daily; Before and during construction phase
3. Construction Phase	**Noise Impacts**	Under the sub-project intervention the overall score is low.	• Avoid high noise making activities during active school hours. One very effective method is to discuss with the school authority and settle for a time for heavy machinery usage. • Involve the community in planning the work program so that any particularly noisy or otherwise invasive activities can be scheduled to avoid sensitive times. • Avoid using of construction equipment producing excessive noise at school time & at night. • Ear protection devices for the workers & site staffs should be available in site during construction period.	Contractor	Environmental and Social Development Specialists of PIU and D&SC	Number of complaints from stakeholders, Use of silencers in noise producing equipment and sound barriers, Noise Level following decibel meter (dB)	Weekly

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Responsible for Execution	Responsible for Monitoring	Monitoring Suggestions	
						Indicators	Frequency
	Air Quality Conducting works at dry season and moving large quantity of materials may create dusts and increase in concentration of vehicle related pollutants which will affect people who live and work near the sites. The impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures.	Under the sub-project intervention the overall score is low.	• Damp down exposed soil and any sand stockpiled on site by spraying with water during dry weather. • Use tarpaulins to cover soils, sand and other loose material when transported by trucks. • Unpaved surfaces used for haulage of materials within settlements shall be maintained dust-free. • Arrangements to control dust through provision of water sprinklers and dust extraction systems shall be provided at all stone crushers (if these establishments are being setup exclusively for the subproject). • Limiting speed of construction vehicles in work sites to maximum of 20 km/h. • Regular monitoring of air quality.	Contractor	Environmental and Social Development Specialists of PIU and D&SC	Location of stockpiles, Covering of trucks, Records of air quality inspection, Numbers of complaints from sensitive receptors, Heavy equipment and pollution control devices, Maintain records	Monthly
	Biodiversity (There are no protected areas in or around subproject sites,	Under the sub-project intervention the overall score is low.	• Prohibit employees from cutting of trees for firewood. • If during detailed design cutting of trees is required, compensatory plantation for trees lost at a rate of 3 trees for every tree	Contractor	Environmental and Social Development Specialists of PIU	If tree cutting required, to be determined during Design stage, Numbers of	Monthly

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Responsible for Execution	Responsible for Monitoring	Monitoring Suggestions	
						Indicators	Frequency
	and no known areas of ecological interest.)		cut. • Prevent workers or any other person from removing and damaging any flora (plant/vegetation) and fauna.		and D&SC	complaints from sensitive receptors	
	Worker's health and safety	Under the sub-project intervention the overall score is low.	• Prevent excessive noise. • Construction staff are to make use of the facilities provided for them (e.g. fires for cooking). • No fires permitted on site except if needed for the construction works. • Staff must be trained up for operating equipment. • Availability and access to first-aid equipment and medical supplies. • Ensure the presence and use of safety gear at site: Ear protection devices, Goggles, Illuminating jackets, Masks, Gloves, Helmets, Uniforms etc., • Ensure adequate supply of drinking water. • Sanitation facilities for male & female workers separately.	Contractor	Environmental and Social Development Specialists of PIU and D&SC	Numbers of complaints from sensitive receptors; Number of walkways signage, and metal sheets placed at project location;	Monthly
4. Post-Construction Phase	**Construction clean-up** (Damage due to debris, spoils, excess construction	Under the sub-project intervention the overall score is low.	• Remove all spoils wreckage, rubbish, or temporary structures (such as buildings, shelters, and latrines) which are no longer required. • All affected structures	Contractor	Environmental and Social Development Specialists of PIU	Worksite is restored to original conditions; worksite cleanup	After the completion of Works

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Responsible for Execution	Responsible for Monitoring	Monitoring Suggestions	
						Indicators	Frequency
	materials).		rehabilitated/compensated. • The area that previously housed the construction camp is to be checked for spills of substances such as oil, paint, etc. and these shall be cleaned up. • All imported materials are to be removed and the area shall be re-vegetated as per specification that forms part of this document. • The contractor must arrange the cancellation of all temporary services.		and D&SC	is satisfactory; camp is restored to pre project conditions.	
	Vegetation	Under the issue the overall score is low.	• After construction work, all structures need to be removed and the area shall be top soiled and re-grassed using the guidelines set out in the re-vegetation specification that forms part of the bidding document.	Contractor	Consultant of D&SC and PIU	Worksite is restored to original conditions.	Over the completion of Works

* Overall Impact Score: Very High =Likely to cause widespread, long-term and irreversible impacts; High= Likely to cause long-term impacts; Moderate = Likely to cause site-specific temporary impacts; Low = Likely to cause little, short-term impacts;

**Post-construction phase denotes the time period contractor use to clear and clean up the sites after the construction work is ended, perform tree plantation, grass turfing, and minor rectification till the official handing over the site to LGED, or owner of the site.

Annex -F: Guideline for Preparing Environment and Social Management Plan (ESMP)

The Consultant is required to develop an Environmental and Social Management Plan (ESMP) consisting of a set of feasible and cost-effective mitigation measures and monitoring and institutional plan to prevent or reduce significant negative impacts to acceptable levels. This will include measures for emergency response to accidental events (e.g., fires, explosions), as appropriate. The Consultant will provide an estimation of the impacts and costs of the mitigation measures, and of the institutional and training requirements to implement them. In particular, this would include:

- **Environmental and Social Mitigation & Enhancement Measures:** Recommend feasible and cost-effective measures to prevent or reduce significant negative impacts to acceptable levels. Apart from mitigation of the potential adverse impacts on the environmental components, the ESMP shall identify opportunities that exist for the enhancement of the environmental quality along the surrounding area. Residual impacts from the environmental measures shall also be clearly identified. The ESMP shall include detailed specification, bill of quantities, execution drawings and contracting procedures for execution of the environmental mitigation and enhancement measures suggested, separate for pre-construction, construction and operation periods. In addition, the ESMP shall include good practice guides related to construction and upkeep of plant and machinery. Responsibilities for execution and supervision of each of the mitigation and enhancement measures shall be specified in the ESMP. Meaningful consultation with potential stakeholders including vulnerable groups will be conducted before finalizing the design and EMSPs, as per SEP and Section 7.2.4 in the main report. A plan for continued consultation to be conducted during implementation stage of the project shall also be appended.

- **Institutional Arrangements, Capacity Building and Trainings:** The ESMPs shall describe the implementation arrangement needed for the project, implementation of ESMP, especially the capacity building proposals including the staffing of the environment unit (as and when recommended) adequate to implement the environmental mitigation and enhancement measures. For each staff position recommended to be created, detailed job responsibilities shall be defined. Equipment and resources required for the environment unit shall be specified, and bill of quantities prepared. A training plan and schedule shall be prepared specifying the target groups for individual training project, the content and mode of training. Training plans shall normally be made for the client agency (including the environmental unit), the supervision consultants and the contractors.

- **Supervision and Monitoring:** Environmental monitoring plan will be an integral part of the ESMP, which outlines the specific information to be collected for ensuring the environmental quality at different stages of project implementation. The parameters and their frequency of monitoring should be provided along with cost of the monitoring plan and institutional arrangements for conducting monitoring and supervision. Reporting formats should be provided along with a clear arrangement for reporting and talk corrective action. The ESMP shall list all mandatory government clearance conditions, and the status of procuring clearances.

- **Reporting:** The ESMP will specify the documentation and reporting requirements, specifically, complete record will be maintained for monitoring, trainings, grievances, accidents, incidents, resource usage, and waste disposal quantities.

- **Grievance Redress Mechanism:** The ESMP will describe the grievance redress mechanism (GRM) to address the project-related grievances and complaints particularly from the local communities.

- **ESMP implementation cost:** The ESMP will also include the cost of its implementation including personnel costs, costs on trainings, effects monitoring, additional studies, and others.

Annex -G: Details of the Environmental and Social Code of Practices (ESCoPs)

The objective of preparation of the Environmental and Social Code of Practices (ESCoPs) is to address less significant environmental and social impacts and all general construction related impacts of the proposed project implementation. The ESCoPs will provide guidelines for the best operating practices and environmental management and social guidelines to be followed by the contractors for sustainable management of all environmental issues, irrespective of site conditions and surrounding environment.

ESCoP 1: Waste Management

Project Activity/ Impact Source	Impacts	Mitigation Measures/ Management Guidelines
General Waste	Soil and water pollution from the improper management of wastes and excess materials from the construction sites.	The Contractor shall • Develop waste management plan for various specific waste streams (e.g., reusable waste, flammable waste, construction debris, food waste etc.) prior to commencing of construction and submit to for approval. • Organize disposal of all wastes generated during construction in an environmentally acceptable manner. This will include consideration of the nature and location of disposal site, so as to cause less environmental impact. • Minimize the production of waste materials by 3R (Reduce, Recycle and Reuse) approach. • Segregate and reuse or recycle all the wastes, wherever practical. • Prohibit burning of solid waste • Collect and transport non-hazardous wastes to all the approved disposal sites. Vehicles transporting solid waste shall be covered with tarps or nets to prevent spilling waste along the route • Train and instruct all personnel in waste management practices and procedures as a component of the environmental induction process. • Provide refuse containers at each worksite. • Request suppliers to minimize packaging where practicable. • Place a high emphasis on good housekeeping practices. • Maintain all construction sites in a cleaner, tidy and safe condition and provide and maintain appropriate facilities as temporary storage of all wastes before transportation and final disposal.
Hazardous Waste	Health hazards and environmental impacts due to improper waste management practices	The Contractor shall • Collect chemical wastes in 200 liter drums (or similar sealed container), appropriately labeled for safe transport to an approved chemical waste depot. • Store, transport and handle all chemicals avoiding potential environmental pollution. • Store all hazardous wastes appropriately in bunded areas away from water courses. • Make available Material Safety Data Sheets (MSDS)

Project Activity/ Impact Source	Impacts	Mitigation Measures/ Management Guidelines
		for hazardous materials on-site during construction. • Collect hydrocarbon wastes, including lube oils, for safe transport off-site for reuse, recycling, treatment or disposal at approved locations. • Construct concrete or other impermeable flooring to prevent seepage in case of spills.

ESCoP 2: Fuels and Hazardous Substances Management

Project Activity/ Impact Source	Impacts	Mitigation Measures/ Management Guidelines
Fuels and hazardous goods	Materials used in construction have a potential to be a source of contamination. Improper storage and handling of fuels, lubricants, chemicals and hazardous goods/materials on-site, and potential spills from these goods may harm the environment or health of construction workers.	The Contractor shall • Prepare spill control procedures and submit the plan for approval. • Train the relevant construction personnel in handling of fuels and spill control procedures. • Store dangerous goods in bunded areas on a top of a sealed plastic sheet away from watercourses. • Refueling shall occur only within bunded areas. • Make available MSDS for chemicals and dangerous goods on-site. • Transport waste of dangerous goods, which cannot be recycled, to a designated disposal site approved by DoE. • Provide absorbent and containment material (e.g., absorbent matting) where hazardous material are used and stored and personnel trained in the correct use. • Provide protective clothing, safety boots, helmets, masks, gloves, goggles, to the construction personnel, appropriate to materials in use. • Make sure all containers, drums, and tanks that are used for storage are in good condition and are labeled with expiry date. Any container, drum, or tank that is dented, cracked, or rusted might eventually leak. Check for leakage regularly to identify potential problems before they occur. • Store hazardous materials above flood plain level. • Put containers and drums in temporary storages in clearly marked areas, where they will not be run over by vehicles or heavy machinery. The area shall preferably slope or drain to a safe collection area in the event of a spill. • Put containers and drums in permanent storage areas on an impermeable floor that slopes to a safe collection area in the event of a spill or leak. • Take all precautionary measures when handling and storing fuels and lubricants, avoiding environmental

Project Activity/ Impact Source	Impacts	Mitigation Measures/ Management Guidelines
		pollution. • Avoid the use of material with greater potential for contamination by substituting them with more environmentally friendly materials. • Return the gas cylinders to the supplier. However, if they are not empty prior to their return, they must be labeled with the name of the material they contained or contain, information on the supplier, cylinder serial number, pressure, their last hydrostatic test date, and any additional identification marking that may be considered necessary.

ESCoP 3: Water Resources Management

Project Activity/ Impact Source	Impacts	Mitigation Measures/ Management Guidelines
Hazardous Material and Waste	Water pollution from the storage, handling and disposal of hazardous materials and general construction waste, and accidental spillage.	The Contractor shall • Follow the management guidelines proposed in EC0Ps 1 and 2. • Minimize the generation of sediment, oil and grease, organic matter, litter, debris and any form of waste (particularly petroleum and chemical wastes). These substances must not enter waterways, storm water systems or underground water tables.
Discharge from Construction sites	During construction both surface and groundwater quality may be deteriorated due to construction activities in the river, sewerages from construction sites and work camps. The construction works will modify groundcover and topography changing the surface water drainage patterns of the area including infiltration and storage of storm water. These changes in hydrological regime lead to increased rate of runoff, increase in sediment and contaminant loading, increased flooding, groundwater contamination, and effect habitat of fish and other aquatic biology.	The Contractor shall • Install temporary drainage works (channels and bunds) in areas required for sediment and erosion control and around storage areas for construction materials • Install temporary sediment basins, where appropriate, to capture sediment-laden run-off from site • Divert runoff from undisturbed areas around the construction site • Stockpile materials away from drainage lines • Prevent all solid and liquid wastes entering waterways by collecting solid waste, oils, chemicals, bitumen spray waste and wastewaters from brick, concrete and asphalt cutting where possible and transport to an approved waste disposal site or recycling depot • Wash out ready-mix concrete agitators and concrete handling equipment at washing facilities off site or into approved bunded areas on site. Ensure that tires of construction vehicles are cleaned in the washing bay (constructed at the entrance of the construction site) to remove the mud from the wheels. This shall be done in every exit of each construction vehicle to ensure the local roads are kept clean.

Project Activity/ Impact Source	Impacts	Mitigation Measures/ Management Guidelines
Soil Erosion and siltation	Soil erosion and dust from the material stockpiles will increase the sediment and contaminant loading of surface water bodies.	The Contractor shall • Stabilize the cleared areas not used for construction activities with vegetation or appropriate surface water treatments as soon as practicable following earthwork to minimize erosion • Ensure that roads used by construction vehicles are swept regularly to remove sediment • Water the material stockpiles, access roads and bare soils on an as required basis to minimize dust. Increase the watering frequency during periods of high risk (e.g. high winds)
Construction activities in water bodies	Construction works in the water bodies will increase sediment and contaminant loading, and effect habitat of fish and other aquatic biology.	The Contractor shall • Dewater sites by pumping water to a sediment basin prior to release off site – do not pump directly off site • Monitor the water quality in the runoff from the site or areas affected by dredge plumes, and improve work practices as necessary • Protect water bodies from sediment loads by silt screen or bubble curtains or other barriers • Minimize the generation of sediment, oil and grease, organic matter, litter, debris and any form of waste (particularly petroleum and chemical wastes). These substances must not enter waterways, storm water systems or underground water tables. • Use environment friendly and nontoxic slurry during construction of piles to discharge into the river. • Reduce infiltration of contaminated drainage through storm water management design • Do not discharge cement and water curing used for cement concrete directly into water courses and drainage inlets.
Drinking water	Groundwater at shallow depths is contaminated with arsenic and hence not suitable for drinking purposes.	The Contractor shall • Pumping of groundwater shall be from deep aquifers of more than 300 m to supply arsenic free water. Safe and sustainable discharges are to be ascertained prior to selection of pumps. • Tube wells will be installed with due regard for the surface environment, protection of groundwater from surface contaminants, and protection of aquifer cross contamination • All tube wells, test holes, monitoring wells that are no longer in use or needed shall be properly decommissioned.
	Depletion and pollution of groundwater resources	• Install monitoring wells both upstream and downstream areas near construction yards and construction camps to regularly monitor the water quality and water levels. • Protect groundwater supplies of adjacent lands

ESCoP 4: Drainage Management

Project Activity/ Impact Source	Impacts	Mitigation Measures/ Management Guidelines
Excavation and earth works, and construction yards	Lack of proper drainage for rainwater/liquid waste or wastewater owing to the construction activities harms environment in terms of water and soil contamination, and mosquito growth.	The Contractor shall • Prepare a project for prevent/avoid standing waters, which will verify in advance and confirm during implementation • Provide alternative drainage for rainwater if the construction works/earth-fillings cut the established drainage line • Establish local drainage line with appropriate silt collector and silt screen for rainwater or wastewater connecting to the existing established drainage lines already there • Rehabilitate road drainage structures immediately if damaged by contractors' road transports. • Build new drainage lines as appropriate and required for wastewater from construction yards connecting to the available nearby recipient water bodies. Ensure wastewater quality conforms to the relevant standards provided by DoE, before it being discharged into the recipient water bodies. • Ensure the internal roads/hard surfaces in the construction yards/construction camps that generate has storm water drainage to accommodate high runoff during downpour and that there is no stagnant water in the area at the end of the downpour. • Construct wide drains instead of deep drains to avoid sand deposition in the drains that require frequent cleaning. • Provide appropriate silt collector and silt screen at the inlet and manholes and periodically clean the drainage system to avoid drainage congestion. • Protect natural slopes of drainage channels to ensure adequate storm water drains. • Regularly inspect and maintain all drainage channels to assess and alleviate any drainage congestion problem. • Reduce infiltration of contaminated drainage through storm water management design.
Ponding of water	Health hazards due to mosquito breeding	The Contractor shall • Do not allow ponding/storage of water especially near the waste storage areas and construction camps • Discard all the storage containers that are capable of storing of water, after use or store them in inverted position.

ESCoP 5: Soil Quality Management

Project Activity/ Impact Source	Impacts	Mitigation Measures/ Management Guidelines
Filling of Sites with dredge spoils	Soil contamination will occur from drainage of dredged spoils	The Contractor shall • Ensure that dredged sand used for land filling shall be free of pollutants. Prior to filling, sand quality shall be tested to confirm whether soil is pollution free. Sediments shall be properly compacted. Top layer shall be the 0.5 m thick clay on the surface and boundary slopes along with grass. Side Slope of Filled Land of 1:2 shall be constructed by suitable soils with proper compaction as per design. Slope surface shall be covered by top soils/ cladding materials (0.5m thick) and grass turfing with suitable grass. • Leaching from the sediments shall be contained to seep into the subsoil or shall be discharged into settling lagoons before final disposal. • No sediment laden water in the adjacent lands near the construction sites, and/or wastewater of suspended materials excessive of 200mg/l from dredge spoil storage/use area in the adjacent agricultural lands.
Storage of hazardous and toxic chemicals	Spillage of hazardous and toxic chemicals will contaminate the soils	The Contractor shall • Strictly manage the wastes management plans proposed in ECP1 and storage of materials in ECP2 • Construct appropriate spill contaminant facilities for all fuel storage areas • Establish and maintain a hazardous materials register detailing the location and quantities of hazardous substances including the storage, use of disposals • Train personnel and implement safe work practices for minimizing the risk of spillage • Identify the cause of contamination, if it is reported, and contain the area of contamination. The impact may be contained by isolating the source or implementing controls around the affected site • Remediate the contaminated land using the most appropriate available method to achieve required commercial/industrial guideline validation results.
Construction material stock piles	Erosion from construction material stockpiles may contaminate the soils	The Contractor shall • Protect the toe of all stockpiles, where erosion is likely to occur, with silt fences, straw bales or bunds.

ESCoP 6: Erosion and Sediment Control

Project Activity/ Impact Source	Impacts	Mitigation Measures/ Management Guidelines
Clearing of construction sites	Cleared areas and slopes are susceptible for erosion of top soils that affects the growth of vegetation	The Contractor shall • Reinstate and protect cleared areas as soon as possible. • Mulch to protect batter slopes before planting

Project Activity/ Impact Source	Impacts	Mitigation Measures/ Management Guidelines
	which causes ecological imbalance	• Cover unused area of disturbed or exposed surfaces immediately with mulch/grass turfing/tree plantations.
Construction activities and material stockpiles	The impact of soil erosion is (i) Increased run off and sedimentation causing a greater flood hazard to the downstream, (ii) destruction of aquatic environment in nearby lakes, streams, and reservoirs caused by erosion and/or deposition of sediment damaging the spawning grounds of fish, and (iii) destruction of vegetation by burying or gullying.	The Contractor shall • Locate stockpiles away from drainage lines • Protect the toe of all stockpiles, where erosion is likely to occur, with silt fences, straw bales or bunds • Remove debris from drainage paths and sediment control structures • Cover the loose sediments and water them if required • Divert natural runoff around construction areas prior to any site disturbance • Install protective measures on site prior to construction, for example, sediment traps • Control drainage through a site in protected channels or slope drains • Install 'cut off drains' on large cut/fill batter slopes to control water runoff speed and hence erosion • Observe the performance of drainage structures and erosion controls during rain and modify as required.

ESCoP 7: Top Soil Management

Project Activity/ Impact Source	Impacts	Mitigation Measures/ Management Guidelines
Land clearing and earth works	Earthworks will impact the fertile top soils that are enriched with nutrients required for plant growth or agricultural development	The Contractor shall • Strip the top soil to a depth of 15 cm and store in stock piles of height not exceeding 2m. • Remove unwanted materials from top soil like grass, roots of trees and similar others. • The stockpiles will be done in slopes of 2:1 to reduce surface runoff and enhance percolation through the mass of stored soil. • Locate topsoil stockpiles in areas outside drainage lines and protect from erosion. • Construct diversion channels and silt fences around the topsoil stockpiles to prevent erosion and loss of topsoil. • Spread the topsoil to maintain the physico-chemical and biological activity of the soil. The stored top soil will be utilized for covering all disturbed area and along the proposed plantation sites • Prior to the re-spreading of topsoil, the ground surface will be ripped to assist the bunding of the soil layers, water penetration and revegetation.
Transport	Vehicular movement outside ROW or temporary access roads will affect the	The Contractor shall • Limit equipment and vehicular movements to within the approved construction zone

Project Activity/ Impact Source	Impacts	Mitigation Measures/ Management Guidelines
	soil fertility of the agricultural lands	• Construct temporary access tracks to cross concentrated water flow lines at right angles • Plan construction access to make use, if possible, of the final road alignment • Use vehicle-cleaning devices, for example, ramps or wash down areas.

ESCoP 8: Topography and Landscaping

Project Activity/ Impact Source	Impacts	Mitigation Measures/ Management Guidelines
Land clearing and earth works	Flood plains of the existing Project area will be affected by the construction of various project activities. Construction activities especially earthworks will change topography and disturb the natural rainwater/flood water drainage as well as will change the local landscape.	The Contractor shall • Ensure the topography of the final surface of all raised lands (construction yards, approach roads, access roads, bridge end facilities, etc.) are conducive to enhance natural draining of rainwater/flood water; • Keep the final or finished surface of all the raised lands free from any kind of depression that insists water logging • Undertake mitigation measures for erosion control/prevention by grass-turfing and tree plantation, where there is a possibility of rain-cut that will change the shape of topography. • Cover immediately the uncovered open surface that has no use of construction activities with grass-cover and tree plantation to prevent soil erosion and bring improved landscaping.

ESCoP 9: Borrow Areas Management

Project Activity/ Impact Source	Impacts	Mitigation Measures/ Management Guidelines
Sand/ Soil extraction by excavation	Sand/soil extraction can potentially impact the aquatic habitat, water quality, and key aquatic species and their food availability, and the soil quality Top soil extraction may further lead to soil exposure to strong wind and sunlight, eventually causing top soil blowing away (dust pollution).	The Contractor shall • not extract sand from the river bed in long continuous stretches; alternate patches of river bed will be left undisturbed to minimize the potentially negative impacts on the aquatic habitat. • not collect large quantities of sand/soil from any single location • not excavate deeper than 3 m at any single location. • not carry out sand extraction near chars that have sensitive Habitats • not carry out top soil extraction from any agricultural land • not carry out sand extraction during the night particularly near the chars • obtain approval from before starting sand/soil extraction from any location.

Project Activity/ Impact Source	Impacts	Mitigation Measures/ Management Guidelines
		• carry out sand extraction from sand bars to the extent possible. • carry out soil extraction after first 15 cm of topsoil from any unproductive land, and replacing the top soil after removing the soil underneath. • make soil extraction evenly distributed in an area, up to a certain depth. • maintain record of all sand/soil extraction (quantities, location shown on map, timing, any sighting of key species) • provide silt fences, sediment barriers or other devices around the extraction areas to prevent migration of sediment rich water in to the river channels. • properly collect, treat and dispose the bilge water from of barges, and boats. • properly cover the will: • carry out survey of the area prior to sand/soil extraction • identify any sensitive receptors/habitats (eg, turtle nesting area, bird colony) at or near the proposed sand/soil extraction locations. • determine 'no-go' areas for sand/soil extraction, based upon the above survey, • monitor the activity to ensure that the contractor complies with the conditions described earlier. • survey the area after sand/soil extraction to identify any leftover impacts.

ESCoP 10: Air Quality Management

Project Activity/ Impact Source	Impacts	Mitigation Measures/ Management Guidelines
Construction vehicular traffic	Air quality can be adversely affected by vehicle exhaust emissions and combustion of fuels.	The Contractor shall • Fit vehicles with appropriate exhaust systems and emission control devices. Maintain these devices in good working condition. • Operate the vehicles in a fuel-efficient manner • Cover haul vehicles carrying dusty materials moving outside the construction site Impose speed limits on all vehicle movement at the worksite to reduce dust emissions • Control the movement of construction traffic • Water construction materials prior to loading and transport • Service all vehicles regularly to minimize emissions • Limit the idling time of vehicles not more than 2 minutes.
Construction	Air quality can be	The Contractor shall

Project Activity/ Impact Source	Impacts	Mitigation Measures/ Management Guidelines
machinery	adversely affected by emissions from machinery and combustion of fuels.	• Fit machinery with appropriate exhaust systems and emission control devices. Maintain these devices in good working condition in accordance with the specifications defined by their manufacturers to maximize combustion efficiency and minimize the contaminant emissions. Proof or maintenance register shall be required by the equipment suppliers and contractors/subcontractors • Focus special attention on containing the emissions from generators • Machinery causing excess pollution (e.g. visible smoke) will be banned from construction sites • Service all equipment regularly to minimize emissions • Provide filtering systems, duct collectors or humidification or other techniques (as applicable) to the concrete batching and mixing plant to control the particle emissions in all its stages, including unloading, collection, aggregate handling, cement dumping, circulation of trucks and machinery inside the installations
Construction activities	Dust generation from construction sites, material stockpiles and access roads is a nuisance in the environment and can be a health hazard.	The Contractor shall • Water the material stockpiles, access roads and bare soils on an as required basis to minimize the potential for environmental nuisance due to dust. Increase the watering frequency during periods of high risk (e.g. high winds). Stored materials such as gravel and sand shall be covered and confined to avoid their being wind-drifted • Minimize the extent and period of exposure of the bare surfaces • Reschedule earthwork activities or vegetation clearing activities, where practical, if necessary to avoid during periods of high wind and if visible dust is blowing off-site • Restore disturbed areas as soon as practicable by vegetation/grass-turfing • Store the cement in silos and minimize the emissions from silos by equipping them with filters. • Establish adequate locations for storage, mixing and loading of construction materials, in a way that dust dispersion is prevented because of such operations • Crushing of rocky and aggregate materials shall be wet-crushed, or performed with particle emission control systems.

ESCoP 11: Noise and Vibration Management

Project Activity/ Impact Source	Impacts	Mitigation Measures/ Management Guidelines
Construction vehicular traffic	Noise quality will be deteriorated due to vehicular traffic	The Contractor shall • Maintain all vehicles in order to keep it in good working order in accordance with manufactures maintenance procedures • Make sure all drivers will comply with the traffic codes concerning maximum speed limit, driving hours, etc. • Organize the loading and unloading of trucks, and handling operations for the purpose of minimizing construction noise on the work site
Construction machinery	Noise and vibration may have an impact on people, property, fauna, livestock and the natural environment.	The Contractor shall • Appropriately site all noise generating activities to avoid noise pollution to local residents • Use the quietest available plant and equipment • Modify equipment to reduce noise (for example, noise control kits, lining of truck trays or pipelines) • Maintain all equipment in order to keep it in good working order in accordance with manufactures maintenance procedures. Equipment suppliers and contractors shall present proof of maintenance register of their equipment. • Install acoustic enclosures around generators to reduce noise levels. • Fit high efficiency mufflers to appropriate construction equipment • Avoid the unnecessary use of alarms, horns and sirens.
Construction activities	Noise and vibration may have an impact on people, property, fauna, livestock and the natural environment.	The Contractor shall • Notify adjacent landholders prior any typical noise events outside of daylight hours • Educate the operators of construction equipment on potential noise problems and the techniques to minimize noise emissions • Employ best available work practices on-site to minimize occupational noise levels • Install temporary noise control barriers where appropriate • Notify affected people if major noisy activities will be undertaken, e.g. pile driving • Plan activities on site and deliveries to and from site to minimize impact • Monitor and analyze noise and vibration results and adjust construction practices as required. • Avoid undertaking the noisiest activities, where possible, when working at night near the residential areas.

ESCoP 12: Protection of Biota

Project Activity/ Impact Source	Impacts	Mitigation Measures/ Management Guidelines
Vegetation clearance	Local flora is important to provide shelters for the birds, offer fruits and/or timber/fire wood, protect soil erosion and overall keep the environment very friendly to human living. As such damage to flora has wide range of adverse environmental impacts. Clearance of vegetation may impact shelter, feeding and/or breeding and/or physical destruction and severing of habitat areas	The Contractor shall • Reduce disturbance to surrounding vegetation • Use appropriate type and minimum size of machine to avoid disturbance to adjacent vegetation. • Get approval from supervision consultant for clearance of vegetation. • Make selective and careful pruning of trees where possible to reduce need of tree removal. • Control noxious weeds by disposing of at designated dump site or burn on site. • Clear only the vegetation that needs to be cleared in accordance with the plans. These measures are applicable to both the construction areas as well as to any associated activities such as sites for stockpiles, disposal of fill and construction of diversion roads, etc. • Retain tree hollows on site, or relocate hollows, where appropriate • Leave dead trees where possible as habitat for fauna • Fell the hollow bearing trees in a manner which reduces the potential for fauna mortality. Felled trees will be inspected after felling for fauna and if identified and readily accessible will be removed and relocated or rendered assistance if injured. After felling, hollow bearing trees will remain unmoved overnight to allow animals to move of their own volition. • Do not burn off cleared vegetation – where feasible, chip or mulch and reuse it for the rehabilitation of affected areas, temporary access tracks or landscaping. Mulch provides a seed source, can limit embankment erosion, retains soil moisture and nutrients, and encourages regrowth and protection from weeds. • Return topsoil and mulched vegetation (in areas of native vegetation) to approximately the same area of the roadside it came from. • Avoid work within the drip-line of trees to prevent damage to the tree roots and compacting the soil. • Minimize the length of time the ground is exposed or excavation left open by clearing and re-vegetate the area at the earliest practically possible. • Ensure excavation works occur progressively and re-vegetation done at the earliest • Provide adequate knowledge to the workers regarding nature protection and the need of avoid felling trees during construction • Supply appropriate fuel in the work caps to prevent

Project Activity/ Impact Source	Impacts	Mitigation Measures/ Management Guidelines
		fuel wood collection
Construction activities	The location of construction activities can result in the loss of wild life habitat and habitat quality.	The Contractor shall • Limit the construction works within the designated sites allocated to the contractors • Check the site for animals trapped in, or in danger from site works and use a qualified person to relocate the animal.
	Impact on migratory birds, its habitat and its active nests	The Contractor shall • Not be permitted to destruct active nests or eggs of migratory birds • Minimize the tree removal during the bird breeding season. If works must be continued during the bird breeding season, a nest survey will be conducted by a qualified biologist prior to commence of works to identify and located active nests • Minimize the release of oil, oil wastes or any other substances harmful to migratory birds to any waters or any areas frequented by migratory birds.
Construction camps	Illegal poaching	The Contractor shall • Provide adequate knowledge to the workers regarding protection of flora and fauna, and relevant government regulations and punishments for illegal poaching.
Construction activities in River and Floodplain Water	The main potential impacts to fisheries are hydrocarbon spills and leaks from riverine transport and disposal of wastes into the river and floodplain water	The Contractor shall • Ensure the riverine transports, vessels and ships are well maintained and do not have oil leakage to contaminate river water. • Contain oil immediately on river in case of accidental spillage from vessels and ships and in this regard, make an emergency oil spill containment plan to be supported with enough equipment, materials and human resources • Do not dump wastes, be it hazardous or non-hazardous into the nearby water bodies or in the river.
	The main potential impacts to aquatic flora and fauna River are increased suspended solids from earthworks erosion, sanitary discharge from work camps, and hydrocarbon spills	The Contractor shall • follow mitigation measures proposed in ESCoP 3 : Water Resources Management and EC4: Drainage Management
Construction activities on the land	Filling of ponds for site preparation will impact the fishes	The Contractor shall • Inspect any area of a water body containing fish that is temporarily isolated for the presence of fish, and all fish shall be captured and released unharmed in adjacent fish habitat • Install and maintain fish screens etc. on any water intake with drawing water from any water body that contain fish.

ESCoP 13: Road Transport and Road Traffic Management

Project Activity/ Impact Source	Impacts	Mitigation Measures/ Management Guidelines
Construction vehicular traffic	Increased traffic use of road by construction vehicles will affect the movement of normal road traffics and the safety of the road-users.	The Contractor shall • Prepare and submit a traffic management plan to the for his approval at least 30 days before commencing work on any project component involved in traffic diversion and management. • Include in the traffic management plan to ensure uninterrupted traffic movement during construction: detailed drawings of traffic arrangements showing all detours, temporary road, temporary bridges temporary diversions, necessary barricades, warning signs / lights, and road signs. • Provide signs at strategic locations of the roads complying with the schedules of signs contained in the Bangladesh Traffic Regulations. • Install and maintain a display board at each important road intersection on the roads to be used during construction, which shall clearly show the following information in Bangla: ○ Location: Village name ○ Duration of construction period ○ Period of proposed detour / alternative route ○ Suggested detour route map ○ Name and contact address/telephone number of the concerned personnel ○ Name and contact address / telephone number of the Contractor ○ Inconvenience is sincerely regretted.
	Accidents and spillage of fuels and chemicals	The Contractor shall • Restrict truck deliveries, where practicable, to day time working hours. • Restrict the transport of oversize loads. • Operate road traffics/transport vehicles, if possible, to nonpeak periods to minimize traffic disruptions. • Enforce on-site speed limit

ESCoP 14: River/Canal Transport management

Project Activity/ Impact Source	Impacts	Mitigation Measures/ Management Guidelines
Construction activities in River/Canal	The presence of construction activities in the river/canal can cause hindrance and risks to the traffic.	The Contractor shall • Not obstruct other normal riverine/canal transport while doing transport and works • Identify the channel to be followed clearly • using navigation aids such as buoys, beacons, and lighting • Keep regular and close contacts with Bangladesh Inland Water Transport Authority (BIWTA) regarding their needs during construction of the project

Project Activity/ Impact Source	Impacts	Mitigation Measures/ Management Guidelines
		• Provide signage for traffic conforming to the BIWTA requirements
	Accidents	The Contractor shall • Prepare an emergency plan for dealing with accidents causing any human casualties or loss of resources. • Ensure sufficient equipment and staffs available to execute the emergency plans • Provide appropriate lighting and safety protocols in construction areas

ESCoP 15: Construction Camp Management

Project Activity/ Impact Source	Impacts	Mitigation Measures/ Management Guidelines
Siting and Location of construction camps	Campsites for construction workers are the important locations that have significant impacts such as health and safety hazards on local resources and infrastructure of nearby communities.	The Contractor shall • Locate the construction camps at areas which are acceptable from environmental, cultural or social point of view. • Consider the location of construction camps away from communities in order to avoid social conflict in using the natural resources such as water or to avoid the possible adverse impacts of the construction camps on the surrounding communities. • Submit to the for approval a detailed layout plan for the development of the construction camp showing the relative locations of all temporary buildings and facilities that are to be constructed together with the location of site roads, fuel storage areas (for use in power supply generators), solid waste management and dumping locations, and drainage facilities, prior to the development of the construction camps. • Local authorities responsible for health, religious and security shall be duly informed on the set up of camp facilities so as to maintain effective surveillance over public health, social and security matters
Construction Camp Facilities	Lack of proper infrastructure facilities, such as housing, water supply and sanitation facilities will increase pressure on the local services and generate substandard living standards and health hazards.	The Contractor shall provide the following facilities in the campsites: • Adequate housing for all workers • Safe and reliable water supply. Water supply from deep tube wells of 300 m depth that meets the national standards • Hygienic sanitary facilities and sewerage system. The toilets and domestic waste water will be collected through a common sewerage. Provide separate latrines and bathing places for males and females with total isolation by wall or by location. The minimum number of toilet facilities required is one

Project Activity/ Impact Source	Impacts	Mitigation Measures/ Management Guidelines
		toilet for every ten persons. • Treatment facilities for sewerage of toilet and domestic wastes • Storm water drainage facilities. Both sides of roads are to be provided with shallow v drains to drain off storm water to a silt retention pond which shall be sized to provide a minimum of 20 minutes retention of storm water flow from the whole site. Channel all discharge from the silt retention pond to natural drainage via a grassed swale at least 20 meters in length with suitable longitudinal gradient. • Paved internal roads. Ensure with grass/vegetation coverage to be made of the use of top soil that there is no dust generation from the loose/exposed sandy surface. Pave the internal roads of at least haring-bond bricks to suppress dusts and to work against possible muddy surface during monsoon. • Provide child crèches for women working construction site. The crèche shall have facilities for dormitory, kitchen, indoor and outdoor play area. Schools shall be attached to these crèches so that children are not deprived of education whose mothers are construction workers • Provide in-house community/common entertainment facilities dependence of local entertainment outlets by the construction camps to be discouraged/prohibited to the extent possible.
Disposal of waste	Management of wastes is crucial to minimize impacts on the environment	The Contractor shall • Ensure proper collection and disposal of solid wastes within the construction camps • Insist waste separation by source; organic wastes in one pot and inorganic wastes in another pot at household level. • Store inorganic wastes in a safe place within the household and clear organic wastes on daily basis to waste collector. Establish waste collection, transportation and disposal systems with the manpower and equipment/vehicles needed. • Dispose organic wastes in a designated safe place on daily basis. At the end of the day cover the organic wastes with a thin layer of sand so that flies, mosquitoes, dogs, cats, rats, are not attracted. One may dig a large hole to put organic wastes in it; take care to protect groundwater from contamination by leachate formed due to decomposition of wastes. Cover the bed of the pit with impervious layer of materials (clayey or thin concrete) to protect groundwater from contamination. • Locate the garbage pit/waste disposal site min 500 m away from the residence so that peoples are not

Project Activity/ Impact Source	Impacts	Mitigation Measures/ Management Guidelines
		disturbed with the odor likely to be produced from anaerobic decomposition of wastes at the waste dumping places. Encompass the waste dumping place by fencing and tree plantation to prevent children to enter and play with. • Do not establish site specific landfill sites. All solid waste will be collected and removed from the work camps and disposed in approval waste disposal sites.
Fuel supplies for cooking purposes	Illegal sourcing of fuel wood by construction workers will impact the natural flora and fauna	The Contractor shall • Provide fuel to the construction camps for their domestic purpose, in order to discourage them to use fuel wood or other biomass. • Made available alternative fuels like natural gas or kerosene on ration to the workforce to prevent them using biomass for cooking. • Conduct awareness campaigns to educate workers on preserving the protecting the biodiversity and wildlife of the project area, and relevant government regulations and punishments on wildlife protection.
Health and Hygiene	There will be a potential for diseases to be transmitted including malaria, exacerbated by inadequate health and safety practices. There will be an increased risk of work crews spreading sexually transmitted infections and HIV/AIDS.	The Contractor shall • Provide adequate health care facilities within construction sites. • Provide first aid facility round the clock. Maintain stock of medicines in the facility and appoint fulltime designated first aider or nurse. • Provide ambulance facility for the laborers during emergency to be transported to nearest hospitals. • Initial health screening of the laborers coming from outside areas • Train all construction workers in basic sanitation and health care issues and safety matters, and on the specific hazards of their work • Provide HIV awareness project ming, including STI (sexually transmitted infections) and HIV information, education and communication for all workers on regular basis • Complement educational interventions with easy access to condoms at campsites as well as voluntary counseling and testing • Provide adequate drainage facilities throughout the camps to ensure that disease vectors such as stagnant water bodies and puddles do not form. Regular mosquito repellant sprays during monsoon. • Carryout short training sessions on best hygiene practices to be mandatorily participated by all workers. Place display boards at strategic locations within the camps containing messages on best hygienic practices
Safety	In adequate safety facilities to the	The Contractor shall • Provide appropriate security personnel (police /

Project Activity/ Impact Source	Impacts	Mitigation Measures/ Management Guidelines
	construction camps may create security problems and fire hazards	home guard or private security guards) and enclosures to prevent unauthorized entry in to the camp area. • Maintain register to keep a track on a head count of persons present in the camp at any given time. • Encourage use of flameproof material for the construction of labor housing / site office. Also, ensure that these houses/rooms are of sound construction and capable of withstanding wind storms/cyclones. • Provide appropriate type of firefighting equipment suitable for the construction camps • Display emergency contact numbers clearly and prominently at strategic places in camps. • Communicate the roles and responsibilities of laborers in case of emergency in the monthly meetings with contractors
Site Restoration	Restoration of the construction camps to original condition requires demolition of construction camps.	The Contractor shall • Dismantle and remove from the site all facilities established within the construction camp including the perimeter fence and lockable gates at the completion of the construction work. • Dismantle camps in phases and as the work gets decreased and not wait for the entire work to be completed • Give prior notice to the laborers before demolishing their camps/units • Maintain the noise levels within the national standards during demolition activities • Different contractors shall be hired to demolish different structures to promote recycling or reuse of demolished material. • Reuse the demolition debris to a maximum extent. Dispose remaining debris at the designated waste disposal site. • Handover the construction camps with all built facilities as it is if agreement between both parties (contactor and land-owner) has been made so. • Restore the site to its condition prior to commencement of the works or to an agreed condition with the landowner. • Not make false promises to the laborers for future employment in O&M of the project.

ESCoP 16: Cultural and Religious Issues

Project Activity/ Impact Source	Impacts	Mitigation Measures/ Management Guidelines
Construction activities near	Disturbance from construction works to the	The Contractor shall • Communicate to the public through community

Project Activity/ Impact Source	Impacts	Mitigation Measures/ Management Guidelines
religious and cultural sites	cultural and religious sites, and contractors lack of knowledge on cultural issues cause social disturbances.	consultation and newspaper announcements regarding the scope and schedule of construction, as well as certain construction activities causing disruptions or access restriction. • Do not block access to cultural and religious sites, wherever possible • Restrict all construction activities within the foot prints of the construction sites. • Stop construction works that produce noise (particularly during prayer time) shall there be any mosque/religious/educational institutions close to the construction sites and users make objections. • Take special care and use appropriate equipment when working next to a cultural/religious institution. • Stop work immediately and notify the site manager if, during construction, an archaeological or burial site is discovered. It is an offence to recommence work in the vicinity of the site until approval to continue is given by the D&SC/PIU. Provide separate prayer facilities to the construction workers. • Show appropriate behavior with all construction workers especially women and elderly people • Allow the workers to participate in praying during construction time • Resolve cultural issues in consultation with local leaders and supervision consultants • Establish a mechanism that allows local people to raise grievances arising from the construction process. • Inform the local authorities responsible for health, religious and security duly informed before commencement of civil works so as to maintain effective surveillance over public health, social and security matters

ESCoP 17: Workers' Health and Safety

Project Activity/ Impact Source	Impacts	Mitigation Measures/ Management Guidelines
Best practices	Construction works may pose health and safety risks to the construction workers and site visitors leading to severe injuries and deaths. The population in the proximity of the construction site and the construction workers will be exposed to a number	The Contractor shall • Implement suitable safety standards for all workers and site visitors which shall not be less than those laid down on the international standards (e.g., International Labor Office guideline on 'Safety and Health in Construction; World Bank Group's 'Environmental Health and Safety Guidelines') and contractor's own national standards or statutory regulations, in addition to complying with the national standards of the Government of Bangladesh (e.g. `The Bangladesh Labor Code, 2006') • Provide the workers with a safe and healthy work

Project Activity/ Impact Source	Impacts	Mitigation Measures/ Management Guidelines
	of (i) biophysical health risk factors, (e.g. noise, dust, chemicals, construction material, solid waste, waste water, vector transmitted diseases etc), (ii) risk factors resulting from human behavior (e.g. STD, HIV etc) and (iii) road accidents from construction traffic.	environment, taking into account inherent risks in its particular construction activity and specific classes of hazards in the work areas, • Provide personal protection equipment (PPE) for workers, such as safety boots, helmets, masks, gloves, protective clothing, goggles, full-face eye shields, and ear protection. Maintain the PPE properly by cleaning dirty ones and replacing them with the damaged ones. • Safety procedures include provision of information, training and protective clothing to workers involved in hazardous operations and proper performance of their job • Appoint an environment, health and safety manager to look after the health and safety of the workers • Inform the local authorities responsible for health, religious and security duly informed before commencement of civil works and establishment of construction camps so as to maintain effective surveillance over public health, social and security matters.
	Child and pregnant labor	The Contractor shall • not hire children of less than 14 years of age and pregnant women or women who delivered a child within 8 preceding weeks, in accordance with the Bangladesh Labor Code, 2006
Accidents	Lack of first aid facilities and health care facilities in the immediate vicinity will aggravate the health conditions of the victims	• Provide health care facilities and first aid facilities are readily available. Appropriately equipped first-aid stations shall be easily accessible throughout the place of work • Document and report occupational accidents, diseases, and incidents. • Prevent accidents, injury, and disease arising from, associated with, or occurring in the course of work by minimizing, so far as reasonably practicable, the causes of hazards. In a manner consistent with good international industry practice. • Identify potential hazards to workers, particularly those that may be life-threatening and provide necessary preventive and protective measures. • Provide awareness to the construction drivers to strictly follow the driving rules • Provide adequate lighting in the construction area and along the roads
Construction Camps	Lack of proper infrastructure facilities, such as housing, water supply and sanitation facilities will increase pressure on the local services and generate	• The Contractor shall provide the following facilities in the campsites to improve health and hygienic conditions as mentioned in ESCoP 15 Construction Camp Management • Adequate ventilation facilities • Safe and reliable water supply. Water supply from deep tube wells that meets the national standards

Project Activity/ Impact Source	Impacts	Mitigation Measures/ Management Guidelines
	substandard living standards and health hazards.	• Hygienic sanitary facilities and sewerage system. The toilets and domestic waste water will be collected through a common sewerage. • Treatment facilities for sewerage of toilet and domestic wastes • Storm water drainage facilities. • Recreational and social facilities • Safe storage facilities for petroleum and other chemicals in accordance with ESCoP 2 • Solid waste collection and disposal system in accordance with ESCoP 1. • Arrangement for trainings • Paved internal roads. • Security fence at least 2 m height. • Sick bay and first aid facilities
Water and sanitation facilities at the construction sites	Lack of Water sanitation facilities at construction sites cause inconvenience to the construction workers and affect their personal hygiene.	• The contractor shall provide portable toilets at the construction sites, if about 25 people are working the whole day for a month. Location of portable facilities shall be at least 6 m away from storm drain system and surface waters. These portable toilets shall be cleaned once a day and all the sewerage shall be pumped from the collection tank once a day and shall be brought to the common septic tank for further treatment. • Contractor shall provide bottled drinking water facilities to the construction workers at all the construction sites.
Other ESCoPs	Potential risks on health and hygiene of construction workers and general public	The Contractor shall follow the following ESCoPs to reduce health risks to the construction workers and nearby community • ESCoP 2: Fuels and Hazardous Goods Management • ESCoP 4: Drainage Management • ESCoP 10: Air Quality Management • ESCoP 11: Noise and Vibration Management • ESCoP13: Road Transport and Road Traffic Management • ESCoP 14: River/Canal Transport management
Trainings	Lack of awareness and basic knowledge in health care among the construction workforce, make them susceptible to potential diseases.	The Contractor shall • Train all construction workers in basic sanitation and health care issues (e.g., how to avoid malaria and transmission of sexually transmitted infections (STI) HIV/AIDS. • Train all construction workers in general health and safety matters, and on the specific hazards of their work Training shall consist of basic hazard awareness, site specific hazards, safe work practices, and emergency procedures for fire, evacuation, and natural disaster, as appropriate. • Commence the malaria, HIV/AIDS and STI education campaign before the start of the construction phase and complement it with by a strong condom marketing, increased access to condoms in the area as well as to

Project Activity/ Impact Source	Impacts	Mitigation Measures/ Management Guidelines
		voluntary counseling and testing. • Implement malaria, HIV/AIDS and STI education campaign targeting all workers hired, international and national, female and male, skilled, semi- and unskilled occupations, at the time of recruitment and thereafter pursued throughout the construction phase on ongoing and regular basis. This shall be complemented by easy access to condoms at the workplace as well as to voluntary counseling and testing.

ESCoP 18: Stakeholder Consultation

Project Activity/ Impact Source	Impacts	Mitigation Measures/ Management Guidelines
Selection of Sub-projects, Working, storage and labor camp Sites, making design, and implementation arrangements and handing over to proper Authority.	Without proper or inadequate consultation with the appropriate stakeholders, there might have serious difficulties in implementing project ESMF/ESMP and eventually to reach the goal set by the project.	The Contractor shall • Identify potential stakeholders before starting the construction works, and devise the mechanism to consult effectively with them • Communicate to the public through community consultation and other means of communication, as appropriate, regarding the scope and schedule of construction, as well as environmental and social risk that may arise and project's mitigation measures. • Make regular efforts to keep stakeholders informed on project implementation. • Make available all the project documents (including design, drawing, site specific ESMP, construction quality test results, etc.) at site office for all interested stakeholders. • Notify and consult through relevant staffs, with the surrounding community people, disadvantaged or vulnerable groups, and workers, other parties as necessary, about the presence and working procedure of project grievance system. These could be done in conducting FGDs. • Consult with the vulnerable individuals or groups including ethnic communities to have their full consent in construction works following a free prior informed consent (FPIC) attaining process. • Prepare and install project signboard (containing items of works, budget, schedule, GRC contact point, etc.) and posters on different safety rules and services associated with the site management. • Respond and address grievances in a timely manner, forward unresolved grievances to the next level at earliest.

Annex-H: Sample GRM Form

Grievance Form : LGED			
Grievance reference number (to be completed by Project):			
Contact details (may be submitted anonymously)	Name (s):		
	Address:		
	Telephone:		
	Email:		
How would you prefer to be contacted (check one)	By mail/post: ☐	By phone: ☐	By email ☐
Preferred language	☐ Bangla	☐ English	
Provide details of your grievance. Please describe the problem, who it happened to, when and where it happened, how many times, etc. Describe in as much detail as possible.			
What is your suggested resolution for the grievance, if you have one? Is there something you would like LGED or another party/person to do to solve the problem?			
How have you submitted this form to the project?	Website ☐	Email ☐	By hand ☐
	In person ☐	By telephone ☐	Other (specify) ☐
Who filled out this form (If not the person named above)?	Name and contact details:		
Signature			
Name of LGED official assigned responsibility			
Resolved or referred to GRC1?	☐ Resolved	☐ Referred	If referred, date:
Resolved referred to GRC2?	☐ Resolved	☐ Referred	If referred, date:
Completion			
Final resolution (briefly)			
	Short description	Accepted? (Y/N)	Acknowledgement signature
1st proposed solution			
2nd proposed solution			
3rd proposed solution			

Annex-I: Photographs showing different consultation events at target districts

District: Gopalganj

Photo-1: **Community meeting (with ensuring women's participation),** Tuthamandra Govt. Primary School ,10 No Shahapur Union Parishad, Goalganj Sadar, Gopalgonj, Date: 16/11/2021

Photo-2: **Vulnerable women group** meeting, Tuthamandra GPS ,10 No Shahapur Union Parishad, Gopalganj Sadar, Gopalgonj, Date: 16/11/2021

Photo-3: KII meeting, Upazila Education officer, Sadar, Gopalgonj, Date: 15/11/2021

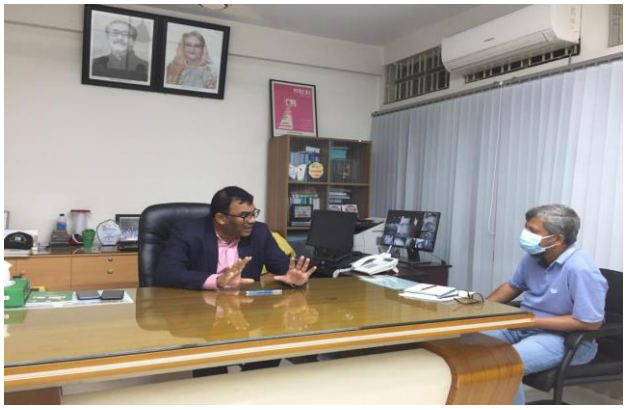

Photo-4: KII meeting, Executive Engineer, LGED, Gopalgonj, Date: 17/11/2021

Photo-5: KII meeting, Sub-Divisional Engineer, WDB, Gopalgonj, Date: 17/11/2021

District: Sunamganj

Photo-6: Community meeting (with ensuring women's participation), 120 No. Shekhergaon Government Primary School, Kurban Nagar, Union,Sadar, Sunamgonj, Date: 16/11/2021

Photo-7: Women group meeting (FGD), 120 No. Shekhergaon GPS, Kurban Nagar Union,Sadar, Sunamgonj, Date: 18/11/2021

Photo-8: KII meeting, Executive Engineer, LGED, Sunamgonj, Date: 18/11/2021

Photo-9: KII meeting, UNO, Sadar,Sunamgonj, Date:18/11/21

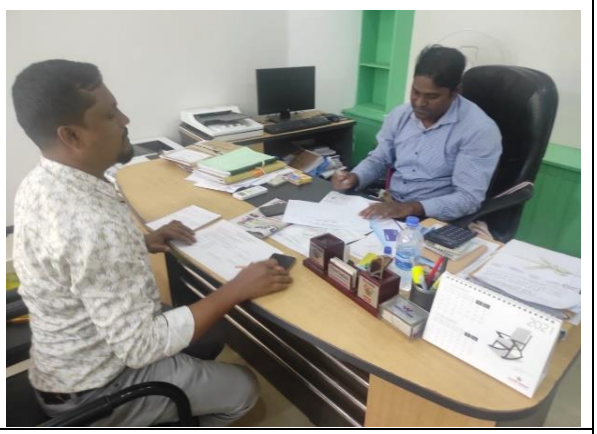

Photo-10: KII meeting, UE,Sadar,Sunamgonj, Date: 18/11/21

	
Photo-11: KII , Upazila Education Officer, Sadar, Sunamganj, Date: 18/11/2021	**Photo-12: KII, Assistant Engineer, WDB, Sunamganj,** Date: 18/11/2021
	
Photo-13: KII, Assistant Engineer, DPHE, sadar, Sunamganj, Date: 18/11/2021	**Photo-14: KII ,** DLO & ULO, Sadar, Sunamganj, Date: 18/11/2021
	
Photo-15: KII, PIO, Sadar, Sunamganj, Date: 18/11/2021	**Photo-16: KII,** Unit Manager, BRAC, Sunamgonj, Date: 18/11/2021

	
Photo-17: KII, General Editor, Daily Sunamkontho & District Council Member, Sunamganj, Date: 18/11/2021	**Photo-18: KII,** President, Sunamganj District Constructor Association, Sunamganj. Date: 18/11/2021

District: Kurigram

<table>
<tr><td> 
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<tr><td>Photo-1: Public consultation: Notan Para GPS, Rowmari, Kurigram , Date: 16/11/2021</td><td>Photo-2: FGD with school teachers: Notan Para GPS, Rowmari, Kurigram, Date: 16/11/2021</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Photo-3:FGD for local women: Nomodas para, Rowmari, Kurigram, Date: 16/11/2021</td><td>Photo-4: FGD with adolescent girls: Sobujpara, Rowmari, Kurigram, Date: 16/11/2021</td></tr>
<tr><td>  </td><td> 
</td></tr>
<tr><td>Photo-5: FGD with vulnerable group: Sobujpara, Rowmari, Kurigram, Date: 16/11/21</td><td>Photo-6: KII, District Education Officer, Department of Education, Kurigram, Date: 16/11/21</td></tr>
</table>

	
Photo-7: KII, Executive Engineer, BWD, Kurigram, Date: 16/11/21	**Photo-8**: KII, Staff Corresponded, Jamuna Television, Member, Kurigram Press club, Date: 16/11/21
	
Photo-9: KII, Dainik songbad, Roumari press club, Rowmari, Kurigram, Date: 16/11/21	**Photo-10: KII,** Principle officer, Grameen Bank, Rowmari, Kurigram, Date: 16/11/21

District: Sirajganj

<table>
<tr><td> 
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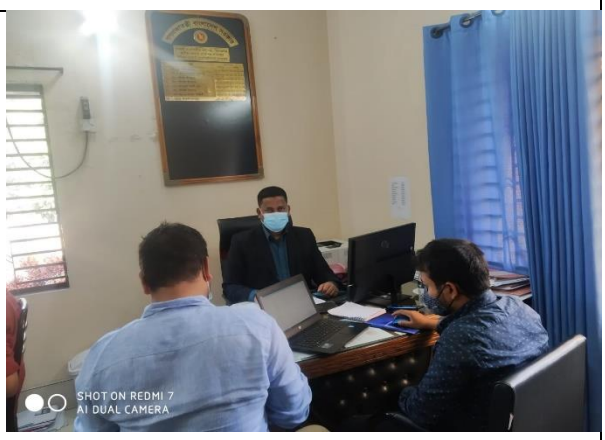
<tr><td>Photo-1: Public Consultation, K R Kowkor GPS, Ullapara, Sirajgonj, Date: 18/11/2021</td><td>Photo-2: FGD, K. R. Noukoir GOVT. Primary School, Date:16/11/2021</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Photo-3: FGD, Noukoit, West para, Date: 16/11/2021</td><td>Photo-4: FGD Noukoir (Halder para). Date: 16/11/2021</td></tr>
<tr><td>  </td><td> 
</td></tr>
<tr><td>Photo-5: Noukoit, West para. Date: 16/11/21</td><td>Photo-6:Sr.AE LGED,Sirajganj, Date:16/11/21</td></tr>
</table>

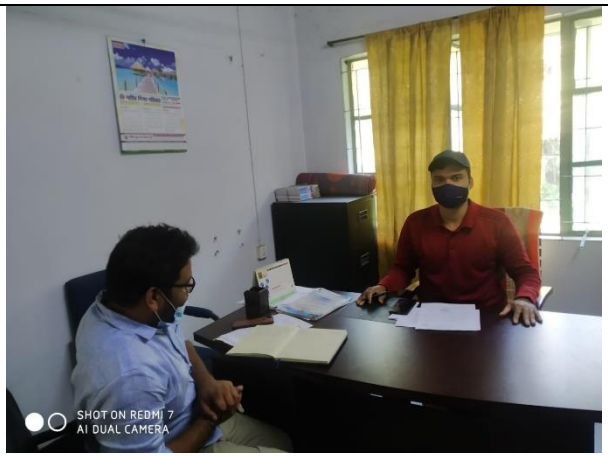


Photo-7: Assistant Inspection , Directorate of Secendary and Higher education, Sirajganj, Date:16/11/21	**Photo-8**: District Education Officer, Directorate of primary education , Sirajganj**,** Date:16/11/21

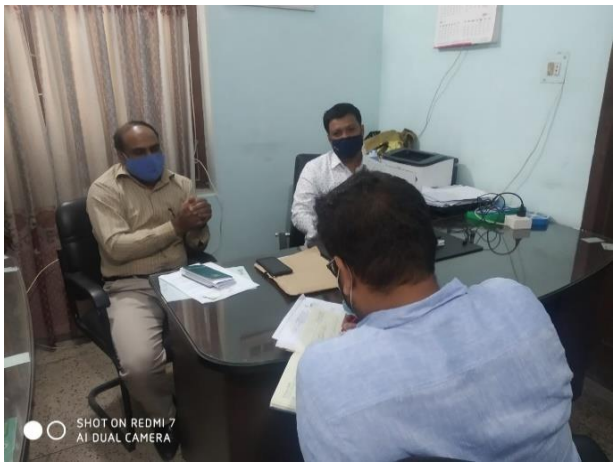
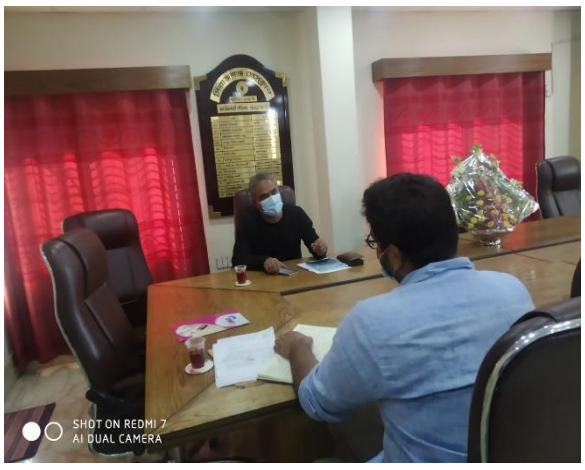

	

Photo-9: BRAC, District Coordinator, Sirajganj, Date:16/11/21	**Photo- 10**: Editor , Ajker Sirajganj, Secretary, Sirajganj Press Club, Sirajgonj, Date:16/11/21

Annex-J: Terms of Reference (ToR) for M&E Consulting Firm

A. Introduction

The Government of Bangladesh has made significant progress in reducing casualties from extreme events or disasters in last couple of decades, with support from development partners. Policy improvement and investments in multi-purpose disaster shelters, Early Warning Systems (EWSs), and government capacity to mitigate the risks and impacts of extreme natural events have been proved to be effective in reducing losses to lives and assets. There is a need to further develop and extend these investments in infrastructure and capacity enhancement to encompass a wider range of geographies and hazards, particularly riverine and flash floods in non-coastal areas in Bangladesh as climate change increases the risks and impacts. Hence, the GoB, thorough its implementing agency- Local Government Engineering Department (LGED) with financial assistance from the World Bank is preparing a project under the title 'Resilient Infrastructure for Adaptation and Vulnerability Reduction (RIVER)' with an aim to reduce the vulnerability of people in targeted communities to riverine and flash floods, improve the country's capacity in disaster preparedness and response, and respond promptly in the event of any crisis or emergency.

The project area covers the most severely affected flood-prone districts in the Teesta-Brahmaputra-Jamuna (Nilpamari, Lalmonirhat, Kurigram, Rangpur, Gaibandha, Bogura, Pabna, Sirajganj), Padma (Rajbari, Faridpur, Gopalganj, Madaripur), and Surma-Meghna river systems in the North East (Sunamganj, Habiganj). Each of these areas, although similar, have important geographical and demographic differences.

There are four distinct components under the project: (i) Resilient flood shelters and community infrastructure: This component will finance land raising and construction of climate-resilient flood shelters in targeted flood-prone villages in non-coastal districts, installation of lightning protection systems, repair and/or rehabilitation of associated climate resilient shelter connecting and community roads, and resilient infrastructure as identified by the community including small scale climate resilient culverts and bridges, repair, rehabilitation of rural markets, repair and rehabilitation of landing stages (river jetties), and installation of solar powered street lights; (ii) Strengthening capacity for disaster preparedness and response and technical assistance: Finance will be provided for good and services to increase the capacity of LGED and communities to plan, manage, and recovery from floods, and strategic studies to increase long-term disaster and climate resilience; (iii) Project Management, Design and Supervision, Monitoring and Evaluation: This component will support the government in implementing the project, and in coordinating all project related activities, monitoring, technical assistance, and training; (iv) Contingency Emergency Response: This component will furnish unforeseen emergency needs, for which funds will be channelized to this component through re-allocation upon the Government's request to support response and reconstruction.

The LGED intends to hire a local consulting firm to assist the PIUs in monitoring and evaluating all aspect of the RIVER project, and its components. It will be financed by World Bank and duration of the assignment is for 5 (five) years.

B. Objectives of the assignment

(a) The overall objective of this assignment is to hire services of a competent Monitoring and Evaluation (M&E) consultancy firm for four primary purposes; (i) carry out M&E of project progress, inputs, outputs, processes, outcomes and impacts in relation to the various project

components carried out by the project implementing agency, including the PIU; (ii) carry out monitoring of project specific operational risks and mitigation measures; (iii) provide and regular feedback to CE, and the Project Director (PD), LGED on its evaluations of the above as well as on any other specific issue as directed by the CE; and (iv) provide assistance to the PIU in monitoring and evaluating; (a) project physical and financial progress and performance, project inputs, outputs, outcomes and impacts; and

(b) environmental and social development and safeguard management aspects with respect to all project components of the project. The M&E Consultant will be directly accountable to the Chief Engineer (CE), LGED, and the PIU of the project will be responsible for its contract management and supervision. In particular, the tasks of the consultants would include:

- Create a comprehensive monitoring and evaluation framework for the RIVER;
- Develop baselines for the key project indicators for tracking project inputs, outputs, outcomes, and operational risks;
- Track key indicators (input, output and outcome) during project implementation,
- Carry out process monitoring and evaluation;
- Carry out monitoring and evaluation of governance risks of the project;
- Recommend appropriate corrective actions and recommendations;
- Supervise the implementation and compliance of the Environmental and Social Management Framework (ESMF) and Social / Resettlement Policy Framework(RPF) along with other ES documents;
- Provide concurrent report to CE and World Bank;
- Preparation of Mid Term Review (MTR) report;
- Preparation of Implementation Completion Report (ICR) and
- Strengthen the capacity of the project implementing agencies, including the PIU, to monitor project impacts.

C. Outline of the tasks / responsibilities of the consultants

Key Activities: The key activities under this assignment include:

Task 1: Create a comprehensive monitoring and evaluation framework for the Project

3. It includes the outcome indicators for monitoring Project Development Objective, intermediate output indicators for all project components, and tentative baseline conditions for each indicator, year wise achievement of targets against each outcome/output indicator. The Consultant is expected to use this as the base document for the development of project specific M&E framework, if necessary, by adjusting and fine-tuning the indicators and targets.
4. The M&E framework should also include indicators to monitor and evaluate project specific operational risks and risk mitigation measures. The major objective of this dimension of monitoring is to ensure governance aspects of the project and minimize risks of misappropriation of project resources. However, more operational indicators need to be developed and systems, procedures and record keeping arrangements have to be established on ground to monitor compliance with the proposed broader remedial measures; These measures need to be maintained efficiently to identify fraud and corruption risks of the project in respect

of each project component and to monitor and evaluate the levels of risk, compliance with and impact of the designed risk mitigation measures in the project. The Consultant is expected to develop, establish, and monitor a sound and transparent system of record keeping at community level, related with the transfer and delivery of capital assets and consumable items and related financial transactions.

5. The Consultant is expected to finalize the M&E framework covering those dimensions as early as possible after its mobilization, preferably through a consultative workshop with the participation of relevant officials from different stakeholder agencies. The Consultant is expected to present final M&E framework, inter-alia, as one of the main outputs in the Inception Report of the Consultant.

Task 2: Develop baselines for the key project indicators for tracking project Inputs, outputs and outcomes.

6. The Consultant is responsible for the establishment of baseline status against all project indicators of the final M&E framework to be able to monitor outcomes and impacts. Accurate establishment of the generic baseline situation is particularly vital. As early as possible after the mobilization, Consultant is expected to design a baseline survey methodology in the project areas in consultation with the PIU.
7. The Consultant is expected to start the baseline surveys including the environmental parameters (physical, chemical and biological environment) and establish the baseline status immediately after the mobilizations and present the methodology for and progress of compiling generic baseline status for each indicator as one of the outputs of Inception Report. Consultant is expected to suggest its proposed methodology for baseline surveys in their proposal which will be used as one of the criterion for proposal evaluation.

Task 3: Track key indicators (input, output, outcome, and operational risks) during project implementation

8. Consultant is expected to develop appropriate methods, surveys, tools, data collection formats, and analytical procedures to track and monitor project inputs, evaluate outputs and outcomes generated due to project interventions throughout project implementation. The M&E may include periodic as well as generated regular field surveys, Interviews/Focus Group Discussions, Participatory monitoring, and social and technical auditing. Consultant is expected to suggest its proposed methodologies for tracking and M&E of inputs, outputs and outcomes in their proposal to the PIU which will be used as one of the criterion for proposal evaluation.

Task 4: Carry out process monitoring of the Project

9. Consultant is expected to carry out process monitoring of the project using specialized techniques and tools. The process monitoring is very important because the project implementation is designed on the principles of a community-based approach in all phases from need identification, targeting and selecting beneficiaries, and training, and monitoring the inputs. The Consultant is expected to design, establish and carry out a sound process monitoring system for this purpose. Consultant is expected to report on its evaluation of the process in addition to the regular reporting of project progress, inputs, outputs, and outcomes to the PIU

and the World Bank task team. The process monitoring system may also be linked to M&E of operation risks and governance aspects as outlined under Task 3 above of this TOR

Task 5: Recommend appropriate corrective actions and recommendations

10. Consultant is expected to play a continuing role in analyzing the findings and results of M&E and make recommendations to the CE and Implementing agency to be able to take timely corrective actions on implementation strategies and practices. Consultant will provide regular feedback to the implementing agency to ensure and maintain satisfactory implementation progress and disbursements as against the targets and work plans. Based on the M&E of outcomes, Consultant will provide feedback to the CE and to implementing agency on the effectiveness of the implementation processes and approaches. Based on the M&E findings, recommend necessary changes in the project scope, interventions and implementation processes etc., to ensure timely and satisfactory achievement of the expected outcomes of all project components and the overall development objective of the project; If necessary, Consultant will recommend necessary changes in the project scope, interventions and implementation processes etc., for consideration of the CE and implementing agency to ensure timely and satisfactory achievement of the expected outcomes of all project components and the overall development objective of the project.

Task 6: Supervise the implementation and compliance of the Environmental and Social Management Framework (ESMF) and Resettlement Policy Frame-work.

11. To ensure overall environmental and social sustainability of the Project, an Environmental and Social Management Framework (ESMF) and Resettlement Policy Framework (RPF) is being prepared. The Frameworks will serve as a tool to separately assess the environment and social impacts of the components and will serve as a set of guidelines to be used for projects where the precise nature and scale of sub-projects are little known or unknown in advance. These guidelines will also serve as a tool to select the optimal project intervention from social and environmental perspectives, prepare preliminary designs, and to ensure complete integration of social and environmental concerns and mitigation measures in the design for the activities to be undertaken by project implementing agencies. The Consultant will have access to draft framework at the time of preparing the proposals for this Consultancy. The consultant will do the following tasks:

Inception Stage (to be included in the Inception Report)

(i) Review the ESMF and the environmental and social impacts;

(ii) List the monitoring parameters and present in the Inception Report along with the measurement timeline;

(iii) Collect/measure the baseline information from the primary and secondary data and will include in the Inception Report;

(iv) Prepare the outline of the safeguard monitoring report and cleared with the World Bank;

Implementation Stage (To be included in Safeguard Section of Quarterly/Annual Progress/ MTR/ICR)

(i) Ensure that all tasks have met country regulatory requirement and update the information in the monitoring report;

(ii) Measure the activity specific monitoring parameters;

(iii) Report on the status of GRM;

(iv) Monitor the status of quality of overall safeguard compliance;

(v) Monitor the status of training, consultation with stakeholders and include the training and consultation plan for the next quarter;

(vi) Report on the lessons learned from the previous quarter and the area of improvement to ensure better safeguard compliance;

(vii) Report on the status of the application of area of improvement proposal

(viii) Ensure the lab report and relevant pictures are in place;

(ix)Monitor the adequacy of documentation;

12. Separate design and supervision consultants will be hired by the project to assist LGED and the in the designs and supervision of interventions. The responsibility of the M&E Consultant will be, if necessary, to provide recommendations for the revision and updating of the ESMF, RPF, SEP, LMP, and ESCP, during the project implementation based on actual needs and implementation experience; to verify adequacy of assessment and clearance of sub-project specific Environmental and Social Assessments (ESAs), Environmental and Social Management Plans (ESMPs), and Resettlement Action Plans (RAPs) for all sub-projects under the components and of their implementation status and compliance and to analyze the causes of major accidents/injuries (including near misses) and grievances from the stakeholders. Consultant is also responsible to guide project implementing agencies and ensuring that satisfactory institutional arrangements and staffing/skills are available for the above tasks and outcomes.

Task 7: Prepare and submit consolidated quarterly and annual progress reports to the CE, LGED.

13. Consultant will develop appropriate reporting formats in consultation with the CE, PIU and the implementing agencies and guide and provide training to the officials and staff of the implementing agencies for timely preparation of the quarterly and annual work plans, budgets and progress reports. The Consultant will guide officials and staff of the project implementing agencies on the timely preparation of those reports, prepare and submit consolidated reports required by the PIU and the World Bank on agreed dates. In addition, Consultant will provide concurrent reporting to World Bank and PIU on project status and

lessons learned during implementation (including data, analysis, surveys, interviews, photographs, description, and easy-to-read visuals) to enable better adaptive management.

Task 8: Prepare Mid Term Review Report (MTRR) :

14. The GOB and the World Bank will carry out a comprehensive Mid Term Evaluation around December 2024. The purpose of the Mid Term Evaluation is to assess project progress and outcomes and to make mid-course corrections and adjustments to the project design and implementation arrangements based on implementation experience, lessons learned and outcome by the time of the evaluation. Consultant will therefore be responsible for systematic analysis and recording of implementation issues, experience and lessons from the inception of the project. Consultant is also expected to assist the PIU in the preparation of the GOB's Mid Term Review Report (MTRR). The

MTRR should include a comprehensive assessment of the lessons, issues and outcomes and recommendations for mid-course adjustments to project design, budget and implementation arrangements etc. to be served as a guide to the GOB-Bank MTR teams.

Task 9: Prepare Implementation Completion Report (ICR)

15. The GOB and the World Bank will carry out a comprehensive Implementation Completion Review after project completion or any date determined at the MTR leading to the preparation of an Implementation Completion Report by the World Bank. The World Bank will mobilize its own resources to prepare the ICR based on analytical data and information provided by the GOB. Consultant may be expected to carry out some analytical work for this purpose but it is premature to provide information on the nature of the analytical work required.

D. Data, Services & Facilities to be provided by the Client

16. The consultant will be provided with the following data, services and facilities by the PIU for executing and supporting the activities:

- All necessary secondary level data required by the M&E consultant for undertaking the project activities;
- The M&E unit officials of the implementing agencies will also be directly involved in data collection along with the consultants. Additional officials and staff needed for this purpose will be provided by the LGED.

E. Outputs of the consultants / reporting requirements

Deliverable	**Description**	**Schedule (months after signing)**
Inception Report	- Outline of overall methodology to be used - Work plan - Deployment schedule of key officials and staff - Monitoring and Evaluation strategy - Initial list of key indicators to develop baselines - Methodologies for surveys - Formats for Reporting	2 months
Detailed M&E Strategy	- Identification of Indicators and Surveys required	3 months

Report	- M&E Methodologies	
Baseline Survey Report	- Detailed Baseline Status for each indicator	4 months
Regular Reports (monthly, quarterly, annual reports)	- Summary of work completed in last six month and cumulative since inception - Work expected in next six months - Key issues for attention of PSC/World Bank - Process monitoring. - Presentations/Documentation/Video.	As indicated starting from inception report stage
Mid-term Evaluation report	- Assessment and analysis of project outcomes - Benchmarking - Online surveys - Organized monitoring database	1 month before scheduled Mid Term Review
Mid-Term final Report	- Report on progress up to mid-term review - Work expected in remainder of project - Key issues for attention of PCMU/World Bank/PSC (including any suggestions for restructuring related to this Consultancy)	1 month after scheduled Mid Term Review
Draft Final Impact Evaluation Report/ Draft Implementation Completion Report	Project implementation experiences Suggestions for improvement, sustainability and exit strategy Impact assessment of project activities	54 months
Final Report/Implementation Completion Report	After incorporating suggestions on the Draft Final Report	56 months
Deliverables	Description	Schedule (Months after signing)

The consultant will submit 5 copies of the final Impact Evaluation Report and 2 copies of the other reports. All data and reports will also be submitted electronically (as 10 copies of CD-ROMs) in commonly used software formats.

F. Review procedure to monitor consultant's work

17. The consultant shall submit the details of work plan together with their proposal. This work plan should include the details of activities and their schedule. This schedule will be used to monitor and evaluate the progress of activities of the consultant's work. Some other aspects include:

- Timely completion of the activities that include inception report, baseline survey reports etc.
- Content of the reports.
- Methods of data analysis and presentation.

18. The PIU, LGED will be responsible for supervising the consultant's work.

G. Staffing Requirements

19. The consultants should propose a comprehensive team composition with task assignments for each key staff along with sufficient support staffs to meet the objectives and scope of the services. The

estimated staff month for key professional staff is 232 and those of non-key staffs is 236. These staff-months are indicative and the consultants are free to propose their estimate supported by methodology proposed for the implementation of the service.

20. Key professional experts to be evaluated during technical evaluation process for the assignment is given below. The consultant must propose suitable individuals as experts in these key positions; and submit their own estimate of the required number of person-months against each of these key positions to carry out the assignment in conformity with the scope of services.

Key Experts

Sl. No.	Positions
1.	Team Leader- 1 no.
2.	Senior Monitoring and Evaluation Specialist- 1 no.
3.	Senior Environmental Specialist- 1 no.
4.	Senior Social Development Specialist- 1no.

Non-key experts/ Support staff

Sl. No.	Positions
1.	Monitoring Specialist - 1 no.
2.	Office Manager cum Accountant - 1 no.
3.	Computer Operator- 1 no.
4.	MLSS- 1no.

Qualification requirements for the Key staffs are provided below

Position	Educational Qualification	Desirable years of professional experience	Specific experience	Indicative no. of position
Team Leader	Bachelor in civil/water Engineering /Science/ Social Science/other relevant field	8 years	a) 2 years' experience as Team Leader in similar project Or 3 years' experience as Deputy Team Leader in similar project. b) Experience in World Bank or similar Institution funding project.	1
Senior Monitoring and Evaluation Specialist	Bachelor in Civil/Irrigation/Water Engineering/other relevant field	5 years	a) 3 years of experience in monitoring & evaluation of project preferably construction project. b) Experience in World Bank or similar institution funding project.	1
Senior Environmental	Graduation in Environmental	5 years	(a) 3 years of experience in environmental screening,	1

Specialist	Engineering/Environmental science		site-specific impact assessments, mitigation measures and oversee the compliance of environmental management Plan and preferably their monitoring & evaluation activities. (b)Experience in World Bank or similar institution funding project.	
Senior Social Development Specialist	Graduation in Social Science	5 years	(a) 3 years of similar experience in social screening, preparation and implementation of Social Action Plan/Resettlement Action Plan and preferably their monitoring & evaluation activities. (b)Experience in World Bank or similar institution funding project.	1

H. Consultant Selection

21. Consultants will be selected by QCBS method as per World Bank Procurement Regulation for IPF for Borrowers for Goods, Works, Non-Consulting and Consulting Services revised in November 2020.

I. Responsibilities of LGED

22. The consultant shall work under the direct supervision of the Project Director, RIVER (LGED), Dhaka. In case of any unforeseen events, be it in terms of physical or social obstacles at field levels; the LGED concerned field offices will take initiatives to solve them and ensure good working environment.

Technical and project management issues shall be discussed in tri-partite meeting between LGED, PD-RIVER and the consultants. Any unresolved issue, technical or otherwise, would be taken up with LGED through the Project Director and LGED, Dhaka.

The Project Director, RIVER (LGED) shall assist the consultant, as far as possible, in collection of the following data, services and facilities:

- Available hydrological, sub-soil investigation, current rate schedules, related information etc.
- Available maps such as planning map, project index maps, contour maps, mouza maps etc.
- Available studies carried out by different study partners in relation to this study for generation of secondary information and future plans.
- Physical monitoring data collected and preserved by LGED