ARIAS SOCIETY
Assam Rural Infrastructure and Agricultural Services Society
(An Autonomous Body of the Govt. of Assam)
Project Management Unit (PMU) of the Asian Development Bank financed
Assam Sustainable Wetland and Integrated Fisheries Transformation (SWIFT) Project
Agriculture complex, Khanapara, G.S. Road, Guwahati-781022(Assam, India)
Tel:+91361-2332004; website:www.arias.in; email: swift-spd@arias.in

Assam Sustainable Wetland and Integrated Fisheries Transformation (SWIFT) Project

(PROJECT NO: 57042-001)

Procurement of Works
Bidding Document

[Based on the Standard Bidding Document (Dec-2021) of the ADB for Procurement of Works through Single-Stage: Two-Envelope Bidding Procedure, for projects governed by Procurement Regulations for ADB Borrowers: Goods, Works, Non-consulting and Consulting Services-2017]

for

Conservation, Restoration and Rejuvenation works of the Mariampur Eco Tourism Lake of Goalpara District under Assam SWIFT Project

(Vol.2: Environmental Management Plan)

Issued on	**:**	**29 November, 2025**
Invitation for Bids No.	**:**	**ARIAS /ADB-SWIFT/CW10-05**
OCB No	**:**	**ARIAS /ADB-SWIFT/OCB-33**
Employer	**:**	**ARIAS Society, Agriculture Complex Khanapara, Assam -22**
Country	**:**	**India**

Environmental Management Plan

Conservation, Restoration and Rejuvenation works of the 'Mariampur Eco Tourism Lake' of Goalpara District under the Assam SWIFT Project

Table of Contents

ENVIRONMENTAL MANAGEMENT PLAN

The Environmental Management Plan (EMP) (see Table 1.1) for Mariampur Eco Tourism Lake, Goalpara District under the Assam SWIFT Project, provides a structured framework for minimizing environmental impacts and ensuring sustainable wetland management. It outlines mitigation and monitoring measures with defined roles, responsibilities, and timelines for effective implementation by the Department of Fisheries (DoF), contractors, and regulatory bodies. The EMP is aligned with the project's Detailed Engineering Report (DER) and includes site-specific measures to address environmental and human health risks throughout the project lifecycle. This EMP has been developed based on the Initial Environmental Examination (IEE) prepared in accordance with the Asian Development Bank's Safeguard Policy Statement (SPS), 2009.[1]

Objectives of the EMP

The primary objectives of the EMP are to:

- Identify and implement mitigation, avoidance, and compensation measures for potential environmental impacts;
- Ensure compliance with ADB's Safeguard Policy Statement (SPS, 2009) and applicable national/state regulations;
- Define institutional arrangements and monitoring responsibilities; and
- Promote environmental sustainability of the subproject.
- Reference in developing a site-specific environment, health, and safety management plan (SSEHSMP) based on the EMP, customized to address the specific environmental, health, and safety risks and conditions of the project site.

The EMP comprises:

- Mitigation and enhancement measures;
- Environmental monitoring during construction and operation;
- Capacity building and training;
- Implementation timeline and budget; and
- Integration into all project phases.

The EMP spans the 12-month construction phase and requires its inclusion in bidding documents and contracts. It must be accessible at all work sites and will be revise, as needed, during implementation. Non-compliance will be consider a breach of safeguard obligations and may result in contractual penalties or corrective actions. The Contractor is responsible for implementing all relevant measures under the EMP, while the Employer and its consultants shall supervise and monitor compliance as part of the project's environmental safeguards oversight.

[1] See most recent IEE here https://www.adb.org/projects/57042-001/main

ENVIRONMENTAL IMPACT ASSESSMENT OF MARIAMPUR ECO TOURISM LAKE, GOALPARA

BASELINE ENVIRONMENTAL STATUS

GEOGRAPHICAL AND ADMINISTRATIVE CONTEXT:

Mariampur Eco Tourism Lake is situated within the Goalpara district of Assam, India. This wetland has recorded to have an area of 10 hectares, making it a relatively small yet ecologically significant water body within the regional landscape. Its inclusion as one of the "40 priority beels" for initial project processing and due diligence under the Asian Development Bank (ADB) funded "Assam Sustainable Wetland and Integrated Fisheries Transformation (SWIFT) Project" highlights its recognized importance. The project is specifically design to foster the sustainable management of Assam's wetland ecosystems and to advance fisheries development, crucially involving local communities in the management processes and aiming to improve their economic and livelihood conditions. The broader geographical setting of Mariampur Eco Tourism Lake is in the Goalpara district, which lies in the southwestern part of Assam. Its geographical coordinates range from 25°33' to 26°12' North latitude and 90°07' to 91°05' East longitude.

KEY CHARACTERISTICS AND STATUS OF MARIAMPUR ECO TOURISM LAKE

Characteristic	Detail
Name	Mariampur Eco Tourism Lake
Location	Goalpara District, Assam, India
Area	10 hectares
Project Status	Part of ADB Assam SWIFT Project
Coordinates Latitude:	25°54'29.6" N; Longitude: 90°59'6.2" E
Type Wetland (Beel)	Eco-tourism Beel

CLIMATE:

The climate of Goalpara district is classified as humid subtropical. This designation signifies distinct wet (monsoon) and dry seasons that profoundly influence the region's environmental dynamics. During the year, temperatures in Goalpara exhibit a clear seasonal pattern. The hot season extends for approximately seven months, typically from March to October. In contrast, the cool season is considerably shorter, lasting about from December to February.

Rainfall pattern is heavily dominate by the monsoon. The wet season spans approximately 6.1 to 9.3 months, generally from February or April through October or November, characterized by a high probability of daily precipitation. July consistently emerges as the wettest month. Humidity levels are consistently high, particularly throughout the wet season, with "muggy" conditions prevalent from April to October.

TOPOGRAPHY:

The topography of Goalpara district is a complex mosaic, comprising low-lying alluvial plains interspersed with undulating hills that ascend towards the Meghalaya plateau in the southern part of the district. The mighty Brahmaputra River defines the district's northern and western boundaries, serving as a dominant geographical feature. The district have extensively traversed by a network of rivers, with major drainage patterns significantly influenced by the Brahmaputra itself, along with its tributaries.

HYDROLOGICAL:

Wetlands across Assam are recognized for their crucial role as natural hydrological regulators. They function as expansive sponges, absorbing surplus rainwater during the intense monsoon seasons and gradually releasing this stored water during drier periods. This natural regulatory mechanism is vital for mitigating flood intensities in the Brahmaputra floodplains and for facilitating the recharge of groundwater aquifers, which are essential for regional water security.

SOIL CHARACTERISTICS:

The soil of Goalpara district is characterized by younger and older alluvial soils, which have undergone various pedagogical changes over time. These alluvial soils are typically light yellow to light grey in color, indicating their relatively recent formation. Their texture generally ranges from sandy loam to silty loam, reflecting their depositional origin. In certain areas, particularly in forested and foothill regions in the extreme northern part of the district, deep red-color soil is observe, and their texture can vary from clay to sandy loam. These soil types are crucial as they define the agricultural potential and susceptibility to erosion within the district.

ECOSYSTEM SYSTEMS AND BIODIVERSITY

AVIFAUNA AND OTHER WILDLIFE

The rich avifauna and the occasional presence of charismatic megafauna like elephants in regional wetlands represent significant eco-tourism assets for Mariampur Eco Tourism Lake. These natural attractions can draw visitors interested in bird watching, wildlife photography, and experiencing the unique biodiversity of the region. However, it is crucial to recognize that these species are highly sensitive to habitat degradation, pollution, and human disturbance. Therefore, any development of eco-tourism at Mariampur Eco Tourism Lake must prioritize their protection. This includes implementing effective habitat management strategies, controlling visitor access to sensitive areas, and minimizing noise and air pollution from tourism activities. The very designation of Mariampur Eco Tourism Lake as an "Eco Tourism Lake" inherently implies a fundamental responsibility to protect and conserve this valuable wildlife, ensuring that tourism enhances, rather than detracts from, the ecological integrity of the site.

SOCIO-ECONOMIC IMPORTANCE

The dependence on Wetlands for Livelihood exist beyond fishery, wetlands offer a diverse array of resources that contribute to local livelihoods. This includes a variety of aquatic plants that are harvested for food, used as vegetables, or collected as fodder for domestic livestock. Additionally, some beels serve as crucial waterways, facilitating transportation for local communities. The profound dependence of local communities on wetlands for their daily consumption of fish and as a primary source of livelihood establishes a direct and critical link between the ecological health of Mariampur Eco Tourism Lake and the overall wellbeing of its surrounding communities. Any degradation of the Beel's ecosystem directly translates into diminished livelihood opportunities and can exacerbate poverty for these vulnerable populations. This interconnectedness underscores that conservation efforts must inherently consider and address the socio-economic dimensions of wetland management.

POTENTIAL ENVIRONMENTAL IMPACTS & MITIGATION MEASURES

Activity	Potential Impact	Mitigation Measures
Site clearance & excavation	Vegetation loss, soil erosion	Restrict clearance to demarcated areas; preserve riparian vegetation; replant native species after works
Earthwork & embankment works	Increased turbidity, sedimentation	Schedule during dry season; use silt fencing; avoid storing excavated material near water bodies
Material transport & storage	Dust, noise, accidental spillage	Cover trucks; water sprinkling; designate storage areas away from water edge
Construction camps	Wastewater and solid waste generation	Provide sanitation facilities; segregate and dispose waste as per SPCB norms
Operation phase	Disturbance to habitat from human activity	Create buffer vegetation; regulate fishing/harvesting; awareness campaigns for sustainable use

ENVIRONMENTAL MANAGEMENT PLAN (EMP)

INSTITUTIONAL RESPONSIBILITIES

- **Implementation**: Contractor with an Environmental Officer.
- **Supervision**: PIU Environmental Specialist.
- **Monitoring** Third party expert or independent monitoring agency.

MONITORING PLAN

- **Water Quality**: pH, DO, BOD, turbidity — quarterly at designated locations.
- **Noise Levels**: Monthly in sensitive zones.
- **Biodiversity**: Annual surveys of aquatic life and avifauna.
- **Plantation**: Six-monthly survival rate checks.

CAPACITY BUILDING

- Environmental induction training for workers.
- Community sensitization on wetland and biodiversity conservation.

GRIEVANCE REDRESS MECHANISM

- On-site complaint register, escalation to PIU within 7 days, district-level resolution for pending issues.

COST PROVISION FOR EMP

A budget allocation of **₹1.15 lakhs** has been earmarked for the implementation of the Environmental Management Plan (EMP). This provision covers the following activities:

- Air quality monitoring during the pre-construction and construction phases.
- Noise level monitoring during the pre-construction and construction phases.
- Surface water quality monitoring during the pre-construction and construction phases.
- Sediment/soil quality monitoring during the pre-construction and construction phases.
- Aquatic biodiversity assessment during the pre-construction and construction phases.
- Wildlife survey during the pre-construction phase to confirm the presence of any IUCN-listed threatened species.

COMPLIANCE & CLEARANCES

- **Statutory**: Water Act, 1974; Air Act, 1981; Wildlife Protection Act, 1972 where applicable.
- **Funding Agency**: Conformance with ADB Safeguard Policy Statement, 2009 environment, involuntary resettlement, and indigenous people's categorization.

- **State Pollution Control Board**: Compliance with waste management, emission control, and dust suppression norms.

Table 1.1. Environmental Management Plan (EMP) for Assam SWIFT Project

Environment Aspects or Project Activities	Civil work/ Project activities	Potential Environmental impacts	Mitigation/Remedial Measures	Time Frame	Institutional Responsibility			
					Responsibility	Monitoring Action/ Indicator	Supervision	Frequency of Monitoring
A. Pre-Construction phase								
Construction Plan	Construction plan including sourcing, handling of materials and equipment's for construction and implementation of plans	Material from unauthorized/illegal sources may disrupt natural environment Construction quality may also be affected by using substandard materials - Lack of specialized equipment's (viz. de-weeding and desilting equipment's) may delay the project - work-related injuries	Construction materials must be sourced only from government-approved suppliers with prior DOF approval. Equipment for de-weeding and desilting must be suitable, preferably small, amphibious, and capable of operating in shallow and deep beel zones with minimal environmental disturbance. Monthly documentation of material sources is required. Materials must be stored on flat, well-drained surfaces, avoiding private/agricultural land. Stacks should be organized by type, size, and length, with clear 800 mm passageways, and kept free of debris or hazards. Materials must be protected from weather to prevent deterioration. Environmentally sound practices for borrow area operations, and reuse/disposal of desilted material and weeds must follow guidelines in: Annexure 1: Guidelines/procedure to ensure environmentally best practice for Desilting Operation, Reuse and Disposal of desilted material Annexure 2:Guidelines/procedure to ensure environmentally sound good practice for De-weeding operation and disposal/reuse of weeds Guidelines/Procedure for Borrow Area Operations and Management (see annexures in recent IEE here: https://www.adb.org/projects/57042-001/main)	Pre-Construction phase	Contractor (after the appointment but prior to construction)	Review and checking of material source and quality checking	CPIU PIU PMU	Once prior to start of construction
Construction requirement	Hiring of workers	Issue related to labor influx, livelihood, conflict of cultural and regional bias	Early consultation shall be made by the contractor with the local community and/or Beel development committee (BDC) before hiring of workers. Employment for local labours should be encouraged to avoid setting of labour camp In case of setting of any labour camp, contractor shall provide labour camps with all basic facilities for all the migrant workers employed till completion of construction and maintenance work in accordance with the Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, and Rules,1996 Early consultations shall be made by the	Pre-Construction phase	Contractor	Review of hiring process	CPIU	At the time hiring of workers/labours

Environment Aspects or Project Activities	Civil work/ Project activities	Potential Environmental impacts	Mitigation/Remedial Measures	Time Frame	Institutional Responsibility			
					Responsibility	Monitoring Action/ Indicator	Supervision	Frequency of Monitoring
			contractor with the local community/BDC to determine the appropriate location of labour camp All migrant workers will undergo workshop/ briefings to sensitize them on local culture and lifestyle awareness					
Construction requirement	Site access and transporting of machines, equipment and vehicles to the subproject site	The selection of machines and vehicles that are not suitable for the site conditions could result in operational problems. Unmaintained machinery, equipment, and vehicles may hinder and delay the implementation of construction and restoration activities	The contractor shall develop and submit a site access plan to CPIU and BDC, using smaller vehicles where needed to avoid road damage. Early engagement with local residents and BDC is required to address concerns. Roads must be inspected and upgraded before transporting machinery, avoiding tree cutting. Protective measures should be implemented to prevent damage to roads and nearby properties. All vehicles and machinery must be site-appropriate, registered, inspected, well-maintained, and have valid PUCs. Only trained and licensed personnel may operate them. Parking must be at designated areas. Records of all machinery, vehicles, and equipment must be submitted to CPIU for review.	Pre-Construction phase	Contractor	Review and checking of material source and quality checking	CPIU	Prior to start of construction and performed during civil works phase as necessary
Temporary accommodation for workers	Setting of Labour Camp and its operations (if any)	Issues may arise related to environmental pollution, sanitation, health and hygiene	Employment for local labours should be encouraged to avoid setting of labour camp However, in case of setting of any labour camp, contractor shall provide labour camps with all basic facilities for all the migrant workers employed till completion of construction and maintenance work in accordance with the Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, and Rules,1996 Guidelines for Setting up of Labour Camp is provided in Annexure A5 (Guidelines for Setting up of Labour Camp)of IEE document for ready reference. (see annexure in recent IEE here: https://www.adb.org/projects/57042-001/main)	Pre-Construction and Construction phase	Contractor	Inspection of labour camp and facilities provided by contractor. CPIU will monitor compliance conditions mentioned in guidelines of Setting up of Labour Camp (Given in Annexure A5 for ready reference.)	CPIU	Prior to start of construction and throughout the construction period
Community utilities and structures	Shifting or dismantling of utilities and structures viz. (Electric lines, poles, telephone	Disruption of services and inconvenience to public	During construction by any chance, any utility (Electric lines, poles, telephone lines, water pipes, tank, access road, pathway etc.) require shifting, prior permission and assistance shall be obtained from concerned agency. Alternate arrangement shall be made prior to any dismantling Nearby people will be informed before any shifting	Pre-Construction phase	Contractor	Inspection of shifting or dismantling of utilities	CPIU	Once prior to start of construction

Environment Aspects or Project Activities	Civil work/ Project activities	Potential Environmental impacts	Mitigation/Remedial Measures	Time Frame	Institutional Responsibility			
					Responsibility	Monitoring Action/ Indicator	Supervision	Frequency of Monitoring
	lines, water pipes, tank, access road, pathway etc.) before construction		and dismantling activities Provide signages to inform people or community about shifting and/or dismantling activities.					
Emergency response	Preparation of emergency response	Lack of emergency response plan may impact man, machinery and materials	Contractor shall prepare and display emergency response plan at work site and labour camp if constructed for situations like fire, flash flood, medical emergency, inundation, accident and community conflicts etc. Conduct drills and awareness on emergency response Contractor shall identify the relevant officials and institutions to be involved during emergency. Prepare a telephone directory of these officials for timely communication and support Adequate provisions shall be made in the engineering design to adapt to extreme meteorological and geo-physical events.	Pre-Construction phase	Contractor	Review of emergency response planning	CPIU PMU	Once prior to start of construction
B. Construction Phase								
Construction EMP	Ensure safeguards documentation, availability of expertise, resources and GRM before start of construction	Lack of site-specific safeguards measures, expertise and resources prior to start of construction may increase environmental impacts	Review and revise EMP to assess if the current mitigation measures need to be updated as per subproject site conditions, due to any changes in the final engineering designs, government requirements, community feedback and/or as a result of any preparatory work undertaken before loan agreement Ensure that staff with appropriate level of expertise for EMP implementation is appointed by the contractor. Ensure appropriate level of monitoring resources are in place before subproject implementation Ensure that construction contracts are responsive to EMP provisions and that mitigation and monitoring measures are adequately budgeted Establish GRM in the DOF, and establish local access points Disclose GRM to community, project beneficiary, affected people before construction begins through signage, websites and notices in community	Construction phase	Contractor CPIU	Prepare Construction EMP (also called BSEHSMP)	PIU/ PMU	Prior to start of construction. No construction will start without approval from PMU. To be updated if any unanticipated impact occurred during construction.

Environment Aspects or Project Activities	Civil work/ Project activities	Potential Environmental impacts	Mitigation/Remedial Measures	Time Frame	Institutional Responsibility			
					Responsibility	Monitoring Action/ Indicator	Supervision	Frequency of Monitoring
			centres Construction materials should only come from Government approved sources with prior approval of CPIU					
Consents, Permits, Clearances, and NOCs	Acquire official permission from government authorities through Consents, Permits, Clearances, No Objection Certificates (NOCs)	Failure to obtain necessary official permission from government authorities may lead to environmental impacts and/or delay in subproject construction.	The contractor must obtain all necessary approvals and ensure compliance with relevant consents, permits, and NOCs before commencing work. Key approvals may include: CTE & CTO for batching plants and DG sets under the Air and Water Acts from SPCB Authorization for hazardous waste (e.g., used oil) under Hazardous Waste Rules, 2016 Approval for disposal of desilted and construction waste under C&D Waste Management Rules, 2016 License for petroleum storage (if applicable) under Petroleum Rules, 2002 PUC certificates for vehicles and machinery under the Motor Vehicle Act, 1988 Consent for borrow area operation, with NOC from local administration and advice from SPCB Permission to set up labour camp, if required, from local authorities All permits must be secured and complied with prior to construction.	Construction phase	Contractor CPIU	Status of Clearances and NOCs	PIU/ PMU	Prior to start of particular activity and renewed during civil works phase as necessary
Land and Soil Environment	Site or land clearing	Loss of vegetation and Impact on land cover and Soil erosion	To prevent vegetation loss, erosion, and land degradation, contractors will limit site clearing, preserve existing vegetation, and stabilize erosion-prone areas. Replanting and site restoration will be done post-construction. Desilting and earthworks will follow controlled methods, avoiding rainy seasons, spawning areas, and sensitive hydro-geological zones. Excavated silt will be reused for bunds, mounds, or levelling, and stored in designated areas to prevent runoff. Material transport will follow dust and spill control measures. Campsites and storage areas will be on uncultivated land and restored after use. Mounds in large beels will be designed as stable bird habitats.	Construction phase	Contractor	Review of implementation of mitigation measures	CPIU	Daily as needed

Environment Aspects or Project Activities	Civil work/ Project activities	Potential Environmental impacts	Mitigation/Remedial Measures	Time Frame	Institutional Responsibility			
					Responsibility	Monitoring Action/ Indicator	Supervision	Frequency of Monitoring
Land and Soil Environment	Excavation and Desilting	Change in topography, and conversion of land	Contractor, in consultation with CPIU and BDC, shall minimize site clearing, preserve vegetation, and stabilize erosion-prone areas. Materials and debris must be properly disposed of, and sites restored post-construction. Earthworks should avoid rainy seasons; borrow areas near embankments must not be opened during monsoons. Desilting shall follow bathymetry surveys, maintaining proper slope and avoiding ecological sensitive zones. Excavated silt must be stored, reused, or disposed of in designated areas to prevent erosion or runoff. Wet silt must be dewatered in Temporary Dumping Yards. Borrow areas must follow IRC:10-1961 and Annexure A6: Guidelines/Procedure for Procedures for Borrow Area Operations and Management. (see annexure in recent IEE here: https://www.adb.org/projects/57042-001/main) Only approved sites shall be used, preserving topsoil and avoiding cultivable land. Borrow pits must be rehabilitated, and environmental and engineering factors considered. Transport of materials must be covered to prevent spills and dust. Avoid areas of spawning and nesting grounds, submerged macrophyte beds and bird nesting sites (if any) during desilting operation.	Construction phase	Contractor	Review of implementation of mitigation measures	CPIU	Daily as needed
	Borrow area location and rehabilitation	Loss of vegetation and Impact on land cover Soil erosion	The contractor will accurately determine the precise locations of the designated borrow areas. Typically, it is advisable to choose government-approved operational borrow locations in the vicinity for extracting earth materials for construction purposes. Nevertheless, if the contractor initiates the establishment of a new borrow area, it is imperative to adhere to the prescribed protocols for running the said borrow area. The choice and suggestions of borrowing sites will be determined by both environmental and civil engineering factors. All efforts shall be made to avoid or minimize tree loss due to borrowing. The trucks shall be covered while transporting the earth. While borrowing the	Construction phase	Contractor	Review of implementation of mitigation measures	CPIU	Daily as needed

Environment Aspects or Project Activities	Civil work/ Project activities	Potential Environmental impacts	Mitigation/Remedial Measures	Time Frame	Institutional Responsibility			
					Responsibility	Monitoring Action/ Indicator	Supervision	Frequency of Monitoring
			earth topsoil shall be preserved The borrow pits shall be rehabilitated after borrowing the earth Opening any borrowing area without permission from the CPIU is strictly prohibited. Borrowing on cultivable lands is prohibited unless the CPIU determines that there are no other viable sources for obtaining resources Use of wasteland, excavation or enlargement of existing land or any hump above ground level for borrowing Indian Road Congress (IRC):10-1961 guideline will govern the selection of borrow pits. In all cases good engineering and construction practices shall be followed Guidelines/ procedure to ensure environmentally sound good-practice for selection of site for borrow area, its operations and management is provided in Annexure A6 (Guidelines/Procedure for Procedures for Borrow Area Operations and Management)of IEE document. (see annexure in recent IEE here: https://www.adb.org/projects/57042-001/main)				
Land and Soil Environment	Generation of waste	Construction waste generation and littering of solid waste may create land pollution and un-hygienic conditions	All of the construction activity shall be contained inside the pre-identified construction area. Contractor shall prepare and implement a Waste Management Plan. To minimize environmental impacts and avoid disposal of earthwork materials, subproject shall maximize the reuse of excavated materials. Manage solid waste according to the following hierarchy: reuse, recycling and disposal. Include designated/approved disposal areas in waste management plan. Coordinate with BDC and CPIU for beneficial use of excavated materials or immediately dispose to designated areas. Recover used oil and lubricants and reuse; or remove from the site. Avoid stockpiling and remove immediately all demolished materials, excess construction materials, solid waste (removed weeds, wood,	Construction phase	Contractor	Review of implementation of mitigation measures	CPIU	Daily as needed

Environment Aspects or Project Activities	Civil work/ Project activities	Potential Environmental impacts	Mitigation/Remedial Measures	Time Frame	Institutional Responsibility			
					Responsibility	Monitoring Action/ Indicator	Supervision	Frequency of Monitoring
			packaging materials, empty containers, oils, lubricants, and other similar items). Prohibit disposal of any material or wastes (including human waste) into drainage, *nallah*, agriculture fields and beel Management of construction wastes should be done as per Construction and Demolition Waste Management Rules 2016 (Refer Annexure A10of IEE: Guidelines for Construction and Demolition Waste Management (as per Construction and Demolition Waste Management Rules, 2016)) (see annexure in recent IEE here: https://www.adb.org/projects/57042-001/main) Construction contractor shall ensure daily collection and periodic disposal of construction waste generated debris, concrete, metal cuttings waste etc. Solid waste will be managed as per the Solid Waste Management Rules, 2016. Waste generated at site to be segregated onsite and recyclables sold off to vendors. During decommissioning, remove all wastes from the construction site and dispose of non-hazardous waste as per recommendation of CPIU and community, while any hazardous waste is to be disposed as the requirement of pollution control board					
	Site clearance, digging and construction	Soil Erosion	Construction activities shall be scheduled such that soil particularly at borrow areas near the stream are not laid bare during the monsoon. will be scheduled to minimize bare soil surfaces, especially at borrow areas, during the monsoon Exposed surface ground shall be resurfaced and stabilized as soon as possible. This shall also be covered with straw or mulch to avoid soil loss Ground disturbances Construction shall be done in phased phases and only at allowed areas so that it is limited to workable size and minimize ground disturbances. Other slope stabilization measures like selection of less eroding materials around stream shall be adopted Check probable areas for soil erosion during	Construction phase	Contractor	Review of implementation of mitigation measures	CPIU	Daily as needed

Environment Aspects or Project Activities	Civil work/ Project activities	Potential Environmental impacts	Mitigation/Remedial Measures	Time Frame	Institutional Responsibility			
					Responsibility	Monitoring Action/ Indicator	Supervision	Frequency of Monitoring
			construction. To control massive soil erosion, appropriate measures will be applied such as use of mulch, blankets, and wood binders, and/or dewatering Slope protection works (viz. stone pitching/or bioengineering measures) shall be implemented at strategic locations to avoid erosion/land subsidence					
	Transportation of workers, machine, and materials around construction sites, link roads, haulage roads, construction camp	Soil Compaction	Movement of construction vehicles, machinery and equipment shall be within the subproject site and pre-defined haulage road (by CPIU and VDC) to avoid compaction agriculture land and loss of standing crops.	Construction phase	Contractor	Review of implementation of mitigation measures	CPIU	Daily
	Hazardous waste generation around construction sites, machine maintenance, use of fuels and lubricants on site, spill accidents, and production of construction wastes	Soil Contamination	Fuelling and maintenance of construction machinery and vehicles shall be carried out at designated place with proper arrangement of waste management. During servicing/repair of equipment and vehicles, suitable drip tray shall be used to prevent oil/grease spills onto the soil, especially in case of emergency repairs collection and disposal Fuel storage and re-fuelling sites shall be kept away from drainage channel Unusable debris to be disposed in designated places assigned by CPIU and community Provision of oil interceptors at wash down and refuelling areas, if needed Ensure hazardous waste is properly labelled, stored onsite at a location provided with impervious surface, shed and secondary containment system as per in accordance with the Hazardous and Other Waste (Management and Trans boundary Movement) Rules, 2016 Waste oil shall be sold off to recyclers authorized by SPCB/ MoEFCC, GoI	Construction phase	Contractor on daily basis	Review of implementation of mitigation measures	CPIU	Daily
Land and Soil Environment	On-site and off-site infrastructure development	Change in land-uses	Prioritize using degraded or unused land for composting to avoid encroaching on productive agricultural land or natural habitats Ensure that the composting units are placed at an	Construction phase	Contractor on daily basis and CPIU	Review of implementation of mitigation measures	CPIU	Daily as needed

Environment Aspects or Project Activities	Civil work/ Project activities	Potential Environmental impacts	Mitigation/Remedial Measures	Time Frame	Institutional Responsibility			
					Responsibility	Monitoring Action/ Indicator	Supervision	Frequency of Monitoring
			appropriate distance from the beel to minimize any direct impact on the beel ecosystem Establish buffer zones with native vegetation around the composting units to act as a barrier, reduce runoff, and improve the local ecosystem's resilience Engage with local communities and provide training on best practices for composting and waste management to ensure sustainable operations and minimize conflicts Limit the construction activities to designated areas to avoid unnecessary clearing or alteration of the surrounding land. Avoid the areas for fish landing and aggregation sites construction that are existing fish habitats and biodiversity Employ construction methods that minimize soil erosion, sedimentation, and other disturbances to the land.					
Hydrology and water Environment	Flooding during construction	Flood at construction site may impact construction equipment, machinery and materials and manpower	DOF will provide adequate engineering design to cater extreme meteorological and geo-physical events. Provision shall be made for adequate size and number of cross drainage structures especially in the areas where land is sloping towards road alignment Access road level (if road located near pondage) shall be raised above HFL level wherever road located level is lesser than HFL Construct interception ditches and drains to prevent runoff entering construction sites, and to divert runoff from sites to existing drainage Regularly clean and maintain ditches The Contractor must monitor meteorological forecasts and alerts issued by India Meteorological Department or IMD.	Construction phase	Contractor	Review of implementation of mitigation measures	CPIU PIU	During rainy seasons and at the time weather alerts
Water Environment	Discharge of construction waste and washing (machinery and other related	Decline of water quality due to on-site and off-site activities	Desilting will be done during low-flow periods using silt curtains to contain sediment. Weeds will be manually or mechanically removed, avoiding chemicals, and reused for composting. Gradual de-weeding and sediment traps will control nutrient release. Non-toxic materials and best	Construction phase	Contractor	Review of implementation of mitigation measures	CPIU	Daily as needed

Environment Aspects or Project Activities	Civil work/ Project activities	Potential Environmental impacts	Mitigation/Remedial Measures	Time Frame	Institutional Responsibility			
					Responsibility	Monitoring Action/ Indicator	Supervision	Frequency of Monitoring
	materials) and wastewater discharge from labor camp (if any) Accidental discharge of engine oil/fuel used to run de-weeding and other machineries		practices will be used to prevent cement or fuel contamination. Hazardous waste will be managed as per regulations. Erosion control via vegetation and geotextiles will be applied. Sustainable aquaculture and wastewater treatment (e.g., wetlands) will be promoted. Camps will have proper sanitation and solid waste systems. No maintenance near water bodies; machinery must be eco-compliant, spill-proof, and well-maintained. Workers will be trained on pollution prevention. Refer to: Annexure A4:Guidelines/procedure to ensure environmentally sound good practice for De-weeding operation and disposal/reuse of weeds Annexure A7:National and International Regulatory Standards and Threshold Limits (see annexures in recent IEE here: https://www.adb.org/projects/57042-001/main)					
Water Environment	Alteration of Water Flow During Construction	During construction of embankments, earthen mounds, and the installation of Hume pipes can significantly alter the natural flow of water in and around the beel Alterations may change the hydrodynamics and ecology of the beel if not properly designed.	Before construction, PMU shall ensure thorough site-specific survey and investigation to understand the natural water flow, flooding patterns, and seasonal dynamics of the beel. Design embankments, earthen mounds, and Hume pipes to minimize alterations to these natural flows Use spillways, sluice gates, and other structures to regulate water levels and flows, ensuring that natural flooding and drying cycles are preserved to support the beel's ecological functions. Ensure that the design of embankments, earthen mounds, and Hume pipes incorporates features such as controlled openings or culverts to allow for natural water flow and maintain ecological connectivity Schedule construction activities outside of critical periods, such as fish breeding seasons, to minimize disruption to the beel's ecological processes	Construction phase	Contractor	Review of implementation of mitigation measures	CPIU	Prior to rainy seasons and as needed
Ambient Air Environment and Noise	Construction activities including earthworks, stone quarrying, transportation of	Emissions from construction equipment, diesel generator (DG) set and vehicles	All project vehicles and machines must have valid PUC certificates. CTE/CTO from SPCB is required for hot mix and batching plants. Dust control measures include water sprinkling, covered trucks, and designated stockpiling away from drains. Equipment must be well-maintained to	Construction phase	Contractor on daily basis	Review of implementation of mitigation measures	CPIU	Daily as needed

Environment Aspects or Project Activities	Civil work/ Project activities	Potential Environmental impacts	Mitigation/Remedial Measures	Time Frame	Institutional Responsibility			
					Responsibility	Monitoring Action/ Indicator	Supervision	Frequency of Monitoring
	materials, storage pilling, stone soling, operation of DG Sets and vehicles movement etc.	movement Dust emission during earthworks and from stone quarrying transportation and during improvement of link road Fugitive dust generation due to wind from stock piling of earth/sand or other loose construction material Smoke from burning of waste or firewood	reduce emissions. Plants should be sited 500m downwind from settlements. Turf embankments and improve unpaved roads to reduce dust. Turn off idle machinery. Emissions and noise will be monitored by accredited agencies, with results compared to standards (Annexure A7 of IEE: National and International Regulatory Standards and Threshold Limits). (see annexure in recent IEE here: https://www.adb.org/projects/57042-001/main)					
	Construction equipment and machinery, drilling and operation of DG set etc.	Increase of ambient noise levels/noise pollution	Stationary equipment shall be placed away from inhabited area in accordance to the National Noise Quality standard, particularly for residential areas (Category C) and silence zones (Category D: hospitals, educational institutions, courts, religious places, etc.), keeping the distance at least 150 m (Category C) and 250m (Category D), to minimize objectionable noise impacts. In the event potential noise sensitive receptors are identified who will experience higher noise due to construction, appropriate temporary noise barriers will be established Operations will be scheduled when people would be least likely to be affected. Construction activities shall be restricted between 10 p.m. and 6 a.m. near residential areas. Protection devices (ear plugs or earmuffs) will be provided to the workers operating in the vicinity of high noise generating machines Construction equipment and machinery shall be fitted with silencers and maintained properly. Noisy equipment, if any, will be provided in separate enclosures. Rubber padding will be used underneath high noise and vibration generating machines Noise measurements shall be carried out along the vicinity as well as in nearby villages to ensure the	Construction phase	Contractor	Review of implementation of mitigation measures	CPIU	Daily as needed

Environment Aspects or Project Activities	Civil work/ Project activities	Potential Environmental impacts	Mitigation/Remedial Measures	Time Frame	Institutional Responsibility			
					Responsibility	Monitoring Action/ Indicator	Supervision	Frequency of Monitoring
			effectiveness of mitigation measures Use of manual labor will be promoted					
Biological Environment	Vegetation clearance/ de-weeding and other construction activities impacting flora and fauna	Impact on terrestrial biodiversity Impact on aquatic wildlife	A pre-construction biodiversity survey will be conducted with Forest Dept. support to identify key species, breeding/spawning grounds, and guide construction scheduling—especially for sensitive sites like KBAs and Reserved Forests (e.g., Mariampur Eco-Tourism Lake). NOC from the Forest Dept. is mandatory before work at Reserved Forest sites. Activities must stay within designated zones, avoiding forest entry. Vegetation clearance and tree felling must be minimized, with NOC and compensatory plantation as per norms. Sediment control, limited in-water work, and eco-friendly weed removal (targeting invasive only) are required. Hunting, fishing, tree cutting for fuel, and night time noise/light are prohibited. Construction must avoid breeding/spawning periods and critical times for birds. Tortoise and avi-fauna impacts shall be mitigated as per Annexure A8 of the IEE: Tortoise and Avi-Fauna Management Plan. (see annexure in recent IEE here: https://www.adb.org/projects/57042-001/main)	Construction phase	Contractor on daily basis	Review of implementation of mitigation measures	CPIU	Daily as needed
Socio-economic and Cultural Environment	Labour Influx	Issue related to labor influx, livelihood, conflict of cultural and regional bias	The contractor shall prioritize hiring unskilled labor from nearby local areas. If needed, labor camps may be set up outside the project site in consultation with VDC and BDC. Migrant workers must attend orientation sessions on local culture. BDC must be informed in advance of any labor influx. Labor camps, if established, must include essential facilities like drinking water, toilets, sanitation, lighting, groceries, and recreation. Contractors will be monitored by CPIU for labor use, wage payments, health and safety, and prevention of child or forced labor. A grievance redress mechanism must be in place for workers and villagers. Structural checks and use of PPEs and fall protection are mandatory. (Refer Annexure A5 of IEE for labor camp guidelines.) (see annexure in recent IEE here: https://www.adb.org/projects/57042-001/main)	Construction phase	Contractor	Review of implementation of mitigation measures	CPIU	Monthly

Environment Aspects or Project Activities	Civil work/ Project activities	Potential Environmental impacts	Mitigation/Remedial Measures	Time Frame	Institutional Responsibility			
					Responsibility	Monitoring Action/ Indicator	Supervision	Frequency of Monitoring
Socio-economic and cultural environment	Due to construction activities, occupational health and safety hazards to construction personnel and public	Occupational health and safety hazards to construction personnel and public	The contractor shall comply with the GoI's Building and Other Construction Workers Regulations and IFC's EHS Guidelines. Key safety measures include: Safety barricading and signage (in English and local language) at all sites Mandatory use of PPEs (helmets, masks, gloves, boots, earplugs, etc.) Speed limits and speed breakers at accident-prone areas Adequate lighting and reflective signs Safety gear in all vehicles/equipment (seat belts, reverse horns, etc.) ELCB and proper earthing for electrical connections Deployment of EHS Officers at construction sites First aid and on-call medical facilities Monitoring of safety incidents and corrective actions Compliance with GoI/local COVID-19 protocols (Refer Annexure A11 of IEE: Standard Operating Procedures (SOPs) and Guidelines for Construction Sites for COVID-19 Outbreak) (see annexure in recent IEE here: https://www.adb.org/projects/57042-001/main)	Construction phase	Contractor	Review of implementation of mitigation measures	CPIU	Daily as needed
Socio-economic and Cultural Environment	Chance find during construction	Chance find of items/materials of cultural and/or archaeological importance subproject	The contractor will take reasonable precautions to prevent workers or any other persons from removing and damaging any PCR. Upon discovery thereof and before removal, acquaint the engineer from DoF of such discovery and carry out instructions Report to CPIU and relevant authorities to comply with Archeological sites and Remains Act, 1958 and as amended Act 2010 of GoI.	Construction phase	Contractor	Review of implementation of mitigation measures	CPIU	Weekly

Table 1.2.Environmental Monitoring Plan (EMoP) for Pre-Construction and Construction Phase

Parameters	Environment Indicators/ Construction Activities	Standards	Frequency	Responsibility	Location	Superv-ision
Preparation for EMP and other site management plan to be approved by PMU	Pre-Construction and Construction Phase	Nonspecific but as per lot condition	Prepare prior to start of construction stage and implement through the construction phase	Contractor CPIU	Subproject beel location	PMU
Contractor shall work within identified areas to avoid unnecessary access to nearby village area Identify site for weed dumping prior to composting and to store excess weeds Site for composting Site for storage of material and equipment's Labour camp site (if any) Silt dumping and reuse sites	Verification of Beel Specific Designs based on site specific survey	As per DPR and/or bidding document complying engineering best practices	Prior construction	Contractor	Subproject beel location	CPIU
Ensure implementation of guidelines for Borrow Area Operations and Management	Site specific EMP, Emergency response Plan Other plans deemed necessary	As per guidelines	Daily during borrowing of earth materials (earth/sand/ stone etc)	Contractor	Borrow area	CPIU
Adequacy of dust suppression techniques	Marking project sites and footprints area	None specific but as per site condition	Daily	Contactor	Construction site/Beel area	CPIU
Visual check landslides/ erosion prone area, stability of bank	Borrow Area (if any)	-	Before monsoon	Contactor	Near Construction site, inlet channels and access routes etc.	CPIU
Record of C&D wastes, solid waste, Hazardous waste, if any	Dust generation	-	Daily	Contractor	Construction site or labour camp (if any)	CPIU
Records of de-weeded quantity/area	Soil erosion and Siltation	As per DPR	Daily during de-weeding operation	Contractor	Beel	CPIU
Records of de-silted quantity/area	Waste generation	As per DPR	Daily during desilting operation	Contractor	Beel	CPIU
Records of weed composted and their utilization	De-weeding	As per DPR	Daily during composting operation	Contractor /BDC	Beel	CPIU
Check clogging of drains, ensure no logging of water, ensure contours levels are restored	Desilting	-	Monthly	Contractor	Construction site	CPIU
General cleanliness, periodic removal of garbage, inspection of toilets and other	Composting		Weekly	Contractor	Construction site and labour camp	CPIU
General heath check-up, identification of water-logged areas having disease vector carrier like mosquitoes etc.	Drainage	-	Monthly	Contractor	Subproject site and labour camp	CPIU
Usage of PPEs, Ensure public and labours safety	Sanitation and Hygiene	-	Daily	Contractor	Subproject site	CPIU
General Security Prevent unwanted access to site	Labour Health check-up	-	Daily	Contractor	Subproject site/ storage area	CPIU
Ensure traffic and Parking management plan	Occupational Health and safety	-	Daily	Contractor	Project sites located at Road and to access road	CPIU
Reporting of chance find to concerned agency and implement cultural properties management plan	Security	-	During chance find	Contractor	Subproject site	CPIU
Match implementation schedule, ensure record keeping of materials and photography of	Traffic management	-	Weekly	Contractor	Subproject site	CPIU

Parameters	Environment Indicators/ Construction Activities	Standards	Frequency	Responsibility	Location	Supervision
construction update including pre and post pictures of de-weeding operations						
PM_{10}, $PM_{2.5}$, SO_2, NO_2, CO (24-hr Sampling)	Air Quality	Ambient Air Quality Standards (given in Annexure A7)	Once before start of construction works as baseline Once during implementation and after completion of construction	Contractor through third party MOEFCC/ NABL accredited laboratories	One location near beel	CPIU
Ambient and occupational exposure. Equivalent noise levels on dB (A) scale for day and nigh	Noise levels	Noise Standards (given in Annexure A7)	Once before start of construction works as baseline Once during implementation and after completion of construction	Contractor through third party MOEFCC/ NABL accredited laboratories	One location near beel	CPIU
Key polluting indicating parameters in surface water as listed in Annexure A12	Water Quality	Surface Water Quality Standards (as per IS: 2296 and designated best use criteria for Class B) (Given in Annexure A7)	Once before start of construction works as baseline Once during implementation and after completion of construction	Contractor through third party MOEFCC/ NABL accredited laboratories	One location near beel	CPIU
Monitoring of nutrients and metals as listed in Annexure A12	Sediment/Soil Quality	MOEFCC soil quality standards for screening of contamination and soil fertility ratings	Once before start of construction works as baseline. Once during implementation and after completion of construction	Contractor through third party MOEFCC/ NABL accredited laboratories	One location near beel	CPIU
Aquatic biodiversity including fish species, macrophytes, avi-fauna Details can be referred Annexure A12	Aquatic Biodiversity and Wildlife Survey to confirm IUCN threatened species if any	-	Once before start of construction works as baseline Once during implementation	Contractor through third party MOEFCC/ NABL accredited laboratories	One location near beel	PMU

Annexure A7: National and International Regulatory Standards and Threshold Limits

Annexure A12: Technical Note on Environment Monitoring, Inventory of flora and fauna, FTK and Beel Health Card

(see annexures in recent IEE here: https://www.adb.org/projects/57042-001/main)

ENVIRONMENTAL RESPONSIBILITIES AND MANAGEMENT UNDER THE ASSAM SWIFT PROJECT

Executing Agency (EA): The Government of Assam, represented by the Assam Rural Infrastructure and Agricultural Services (ARIAS) Society, is the Executing Agency (EA). The EA is responsible for overseeing environmental safeguard compliance at the national and state levels, ensuring alignment with ADB's Safeguard Policy Statement (SPS), 2009, and managing regulatory approvals.

Contractor Responsibilities: The contractor holds primary responsibility for implementing the Environmental Management Plan (EMP) and environmental monitoring during the pre-construction and construction phases. Key responsibilities include:

- Appointing an Environment, Health, and Safety (EHS) focal person.
- Attending site induction workshops conducted by PMU, PIU, and CPIUs.
- Obtaining necessary environmental permits and licenses.
- Ensuring compliance with environmental, health, and safety regulations.
- Conducting baseline environmental monitoring and ongoing quality assessments (air, noise, water, soil and wildlife).
- Performing risk assessments and developing mitigation procedures.
- Implementing all mitigation measures specified in the EMP.
- Providing environmental training for workers and subcontractors.
- Maintaining an on-site environmental logbook and grievance redress records.
- Participating in grievance redress mechanism (GRM) and resolving community concerns.
- Submitting regular EMP compliance reports and incident documentation.
- Promoting continuous improvement and communication with local communities and authorities.
- Developing and submitting a Site-Specific Environmental, Health, and Safety Management Plan (SSEHSMP) and appointing a qualified full-time EHS officer.

EHS Officer Responsibilities: The EHS Officer will support the contractor in implementing environmental and safety measures and report to the Project Manager, CPIU, and PIU. Key tasks include:

- Preparing and updating SSEHSMP, traffic and health & safety plans.
- Ensuring compliance with regulatory conditions and borrow area management.
- Supporting environmentally sound construction and labour camp setup.
- Assisting in procurement of mitigation-related materials.
- Conducting training for contractor staff and maintaining material and grievance registers.
- Submitting safeguard compliance reports to CPIU.

Training and Supervision: PIU and CPIUs will organize EMP and EHS training sessions for contractors and ensure effective implementation. Training will cover EMP procedures, monitoring, documentation, and labour safety protocols.

Monitoring and Documentation: Contractors must maintain detailed documentation on EMP implementation, training, monitoring results, and grievances. PIU and CPIUs will oversee and regularly review these records to ensure transparency and compliance.

Safeguard Implementation Support: PIU will have a full-time Environmental Safeguards Specialist (ESS) and each CPIU will have a full-time Environmental Safeguards Coordinator (ESC) stationed at cluster level. They will supervise EMP implementation, support the GRM, and assist in preparing environmental sections of project progress reports.

PMU Role: The PMU will lead and oversee project implementation, including EMP compliance. It will ensure bidding and contract documents mandate EMP, EHS, and labour law adherence, and coordinate with ADB to monitor safeguard performance.

Environment, Health and Safety Management Requirement: The Contractor shall comply with all applicable national, and state environmental laws and regulations. The Contractor shall also comply with all requirements of the national and local authorities responsible for enforcing environmental health and safety controls, such as the following aspects (but not limited to):

1. Biodiversity conservation and sustainable natural resource management
2. Pollution prevention and abatement
3. Health and safety of workers and nearby community people
4. Control of infectious and communicable diseases (HIV/AIDS, malaria, COVID-19 etc.)
5. Local cultural conservation
6. Labor codes

Environment, Health, and Safety (EHS) Staffing and Responsibilities: The Contractor shall be responsible for ensuring that all workers on site are provided with safe, healthy, and environmentally compliant working conditions to minimize the risk of accidents, injuries, and occupational illnesses. To this end, the Contractor shall recruit a qualified Environment, Health, and Safety (EHS) Officer who will oversee the implementation of all environment, health, and safety requirements. The EHS Officer shall ensure full compliance with relevant national laws and regulations, as well as the Asian Development Bank's SPS 2009. The officer must possess demonstrated experience in managing environmental impacts specific to wetlands, wildlife, and ambient environmental parameters, including air, noise, and water quality. In addition, the officer must be skilled in identifying and mitigating occupational health and safety risks, including those related to work-related injuries and illnesses. The Contractor shall also ensure that all personnel on site—including Employer's representatives and visitors—are provided with, and required to use, appropriate PPE at all times.

SSEHSMP Preparation and Implementation: With guidance from the Employer and/or its consultants, the Contractor shall: (a) establish an operational system for managing environmental, health, and safety (EHS) impacts; (b) prepare a site-specific Environment, Health, and Safety Management Plan (SSEHSMP) based on the EMP and/or its latest updated version, as included in the most recent initial environmental examination (IEE) disclosed on the ADB website;[2] (c) comply with all measures and requirements applicable to the Contractor as outlined in the SSEHSMP, including any corrective action plan specified in environmental monitoring reports prepared by the Employer for ADB, as well as applicable government laws, rules, and standards; and (d) allocate the necessary budget to ensure effective implementation of these measures, requirements, and actions. The IEE and EMP have been prepared in accordance with the ADB's SPS 2009, and are publicly disclosed on the ADB website. The IEE forms part of the bidding documents and can be accessed at ADB website (see footnote). The Contractor is required to thoroughly review the IEE and ensure that all environmental safeguard requirements are fully understood and integrated into project implementation. The IEE will be updated by the PMU, with support from the PIU, as necessary to cover additional beels under the project. The Employer shall ensure that a copy of the updated IEE is provided to the Contractor, or that the Contractor is informed of its availability for download from the ADB website. The Contractor shall review the updated IEE to incorporate any new or revised environmental requirements into the project implementation.

Reporting of Accidents and Incidents: In the event of any serious accident involving significant injury requiring medical treatment, hospitalization, or resulting in a fatality, the Contractor shall immediately notify the Employer through verbal communication, followed by the submission of a formal written incident report at the earliest practicable time. In addition, the Contractor shall promptly inform the relevant local authorities in accordance with the applicable laws and regulations of the country, regardless of whether the accident is fatal or non-fatal.

[2] See most recent IEE: https://www.adb.org/projects/57042-001/main

Worker Welfare and Camp Management: The contractor shall follow legally mandated provisions on health, safety, welfare, sanitation and working conditions and appropriate working campsites during the construction period. At all times, take reasonable precautions to maintain the health and safety of workers and personnel, and to provide a safe work environment. In collaboration with local health authorities, the Contractor shall ensure availability of first aid facilities, and vehicle service to Personnel. The Contractor shall make suitable arrangements for all necessary welfare and hygiene requirements and for the prevention of diseases to include: (a) provision of a sufficient supply of suitable food, (b) adequate supply of drinking water and other water for the use of the Contractor's Personnel, and (c) protection from insect and pest nuisance. Maximise employment of females and local poor and disadvantaged persons for construction and routine maintenance purposes provided that the requirements for efficiency are adequately met.

Environmental Permits and Discharge Standards: The Contractor shall obtain and timely renew all applicable environmental permits and clearances required for project implementation. In coordination with the Employer and/or its consultants, the Contractor shall ensure that all emissions, discharges, and effluents resulting from construction activities remain within the limits prescribed by applicable national laws and regulations, as well as internationally recognized standards such as the World Bank Group's Environment, Health and Safety Guidelines.[3]

SSEHSMP Development Process: The Contractor shall prepare a SSEHSMP using the EMP provided in Table 1.1 of this Section as a guiding framework. With support and guidance from the Employer and/or its consultants, the Contractor must begin by identifying all environmental, health, and safety hazards specific to the site and construction activities. Risk assessment shall be conducted to evaluate the likelihood and severity of potential impacts, forming the basis for developing SSEHSMP to mitigate these risks. The SSEHSMP must comply with applicable national laws and regulations, the ADB's SPS 2009, and internationally recognized good practices such as the World Bank Group's EHS Guidelines. The plan should also include procedures for regular monitoring, internal inspections, documentation, and reporting to ensure effective implementation. The draft SSEHSMP shall be submitted to the Employer for review and approval prior to the commencement of construction activities. The Contractor shall regularly update the SSEHSMP to reflect changes in site conditions, project scope, or applicable regulatory requirements, treating the document as a dynamic management tool throughout the project lifecycle. A copy of the approved SSEHSMP will be maintained at the project site and made readily accessible to all personnel, including the Employer and its consultants, ADB and other stakeholders.

SSEHSMP Monitoring and Reporting: To assess the effectiveness, the Contractor shall conduct monitoring of the SSEHSMP. Environmental monitoring (Table 1.2) must be carried out by a NABL- and/or MOEFCC-accredited agency. The Contractor shall complete the EMP checklist provided as Annexure 1, maintain records and submit copies to the Employer and its consultants as part of monthly safeguard compliance reports. An environmental monitoring report shall be submitted using the format to be provided by the Employer and its consultants. The Contractor shall submit monthly reports to the Employer on the carrying out of SSEHSMP. Such reports shall be monitored by the Employer and/or its Consultants.

Grievance Redress Mechanism (GRM): Contractor shall participate and adhere GRM established under the project which to receive and facilitate resolution of the affected people's concerns and grievances regarding the project's environmental performance. Contractor makes all affected persons and his staff aware of processes available for the redress of grievances that are easily accessible. The contractor shall also ensure installation of display boards at construction site with GRM information.

[3] https://www.ifc.org/en/insights-reports/2000/general-environmental-health-and-safety-guidelines

Budget for Mitigation Measures and Variations: Contractor will bear the costs of all mitigation measures and monitoring during construction and shall be budgeted bid. As may be instructed by the Employer, the Contractor shall undertake any redesign and/or additional works recommended in the updated EHSMP. Additional cost to the Contract of such variation shall be determined mutually by Contractor and Employer.

Environmental Management Budget: Most EMP mitigation measures are standard good practices and covered by contractors as part of their bids. These include health and safety compliance, labour insurance, equipment fitness, and welfare provisions. Therefore, they are not separately costed under the EMP. However, costs for environmental monitoring and training are to be estimated based on experience from similar projects. The subproject-specific EMP cost must be derived using the indicative costs provided in Table 1.3.

Contractors will bear the costs of all mitigation measures and monitoring during construction, which shall be budgeted in the bids. Project proponent will bear the costs related to setting up and running the GRM and mitigation measures during operation.

Table 1.3. Cost Estimates to Implementation of EMP

Sl. No.	Particulars	Stages	Unit	Total Number	Rate (INR)	Cost (INR)	Costs Covered By
A.	**Mitigation Measures**						
1.	Obtaining and submission of copies (to CPIU/PMU) all consents, permits, clearances, Consent-to Establish (CTE) and Consent to Operate (CTO), no objection clearances or NOCs, other relevant permits from various authorities before the start of construction	Pre-Construction	-	-	-	Its contractor's responsibility and cost covered under contract cost	Civil works contract
2.	Reuse and disposal desilted material or construction wastes/weeds to designated locations.	Construction	-	-	-	Its contractor's responsibility and cost covered under contract cost	Civil works contract
3.	Shifting of utilities (if any) including alternate arrangement and provision of signages and traffic management (if needed)	Pre-Construction and Construction		-	-	Part of routine duty of contractor	Civil works contract
4.	Provision of all requisite facilities (i.e. drinking water supply, sanitation, domestic solid waste collection and disposal, fuel supply etc.) at construction camp (if any). Decommissioning of construction camp before handling over the subproject.	Construction	-	-	--	Its contractor's responsibility and cost covered under contract cost	Civil works contract
5.	Water sprinkling for dust suppression, barricading, temporary noise barriers, and provision of personal protective equipment such as boots, ear plugs/ muffs, etc. and First aid boxes and health checkup for labours	Construction	-	-	-	Its contractor's responsibility and cost covered under contract cost	Civil works contract
6.	General cleanliness, inspection of sanitation work and Check clogging of drains and visual check of landslides/erosion prone areas and mitigation measures taken	Construction	-	-	-	Part of routine duty of contractor	Civil works contract
7.	Photography and record keeping of construction progress and Reporting	Construction	-	-	-	Part of routine duty of contractor	Civil works contract
8.	Cost of implementation of specific mitigation measures suggested in EMP Table 1.1	Construction Phase	-	-	-	Its contractor's responsibility and cost covered under contract cost	
Subtotal (A)						**Nil**	
B. Monitoring Measures during Construction Phase							
1.	Air quality monitoring (refer Table 1.2)	Pre-Construction and Construction	Per sample	3	10,000	30,000	The cost of monitoring has already been budgeted under Project Output-1 as part of Beel Health Monitoring, to be implemented by the PMU.
2.	Noise levels monitoring (refer Table 1.2)	Pre-Construction and Construction	Per sample	3	3,000	9,000	
3.	Surface water monitoring (refer Table 1.2)	Pre-Construction and Construction	Per sample	3	8000	24,000	
4.	Sediment/Soil monitoring (refer Table 1.2)	Pre-Construction and Construction	Per sample	3	4000	12,000	
5.	Aquatic Biodiversity (refer Table 1.2)	Pre-Construction and Construction	Per sample	2	10000	20,000	
Subtotal (B)						**95,000**	
EMP implementation and Monitoring Measures during Construction Phase (A+B)							
C. EMP implementation and Monitoring Measures during Operational Phase							
1	Cost of implementation of Mitigation measures suggested for the operational phase mentioned in EMP Table 1.1 and Cost of implementation of Monitoring suggested for Operational Phase (Table 1.3)	Operational Phase	Per Beel	**1**	**-**	Financial support for Beel management activities has already been provided to the BDC under the project cost.	
D. Capacity Building on Environmental Safeguard matters							
1	Training Program for Safeguards Compliances and Reporting (refer Table 1.6 of IEE report)	Pre-construction and Construction	-	-	-	The training program will be conducted by subject matter experts from the contractual staff, Wetlands	

Sl. No.	Particulars	Stages	Unit	Total Number	Rate (INR)	Cost (INR)	Costs Covered By
						International, or other relevant service providers engaged under the project. The training and capacity development program, along with its associated costs, have already been accounted for under Component-1.	
E	Misc. Expenditure (Contingency)	Pre-construction and Construction			Lump sum	20,000	
Grand Total of EMP Implementation for civil works of Mariampur Eco Tourism Lake of Goalpara district under the Assam SWIFT Project. Total (A+B+C+D+E)						**1,15,000**	
***All of EMP items are already budgeted under the Project Cost.**							

CONCLUSIONS AND RECOMMENDATIONS

The Department of Fisheries, Govt. of Assam, plans to develop Mariampur Eco Tourism Lake in Goalpara District under the Assam SWIFT project to promote sustainable fisheries and biodiversity conservation. While the interventions—such as desilting, de-weeding, mound construction, inlet cleaning, embankments, and fish-rearing ponds—aim to benefit local communities and the environment, they may also cause temporary, localized impacts.

The environmental assessment concluded that the subproject will not cause significant adverse effects. Most impacts are expected to be minor to moderate, short-term, and manageable through design standards, planning, and mitigation measures outlined in the Environmental Management Plan (EMP). Key concerns include potential water quality issues, minor air and noise pollution, and occupational health risks during construction.

The project aligns with ADB's Safeguard Policy Statement (2009) and is classified as Category B. An IEE and EMP (Table 1.1 and EMoP Table 1.2) have been prepared, addressing all project components. EMP measures will be integrated into contract documents and strictly monitored to ensure compliance and allow course correction during implementation.

The project is expected to enhance wetland health, protect fish habitats, and improve livelihoods. No significant residual or cumulative impacts are anticipated. Dedicated teams at PMU, PIU, and CPIUs will support design, monitoring, and safeguard compliance. The EMP will be updated as needed to address unforeseen impacts and ensure full adherence to ADB and national environmental requirements.

Annexure 1: Construction Site Checklist for EMP implementation and Compliance Monitoring (to be used by contractor in field)

Subproject/Beel Name:
Contractor Name:
Filled by:

Sl.No.	Action/Activities	Status (Yes/No)	Additional Measures required as per EMP	Frequency	Remarks
1.	EHS supervisor appointed by contractor and available on site since joining			Prior to start of construction and monthly thereafter	
2.	EHS supervisor/contractor staff/labours attended training/workshop related to EMP and safeguard compliances			Prior to start of construction and after joining of any new staff or labour force	
3.	Whether all consents/NOCs as applicable are taken prior to work execution including tree cutting permission, CTO/CTE?			Prior to start of construction and monthly thereafter	
4.	Whether shifting or dismantling of utilities viz. electric lines, poles, telephone lines, water pipes etc. are done properly and alternative provided?			Once prior to start of construction	
5.	Whether uncultivated areas/waste land used for storage and/or handling of construction materials, and construction camp?			Once prior to setting of material storage site and construction camp	
6.	Verify that site for composting is marked and ready for composting process prior de-weeding operation			Once prior to start of de-weeding	
7.	Whether borrow pits (if any) are located at upstream side?			Once prior to start of borrowing	
8.	Is there any impact on water availability for during construction?			Monthly	
9.	Site management plan (Labour, safety, material, schedule, equipment etc.,) prepared			Prior to start of construction and monthly thereafter	
10.	Is material sourcing being done from authorized sources?			Monthly	
11.	Is material transfer route to the site identified and able to vehicle carry load?			Monthly	
12.	Whether any additional tree cut down to provide access road or working area?			Monthly	
13.	Whether mitigation measures suggested to minimize the impacts on topography and drainage patterns are taken properly?			Monthly	
14.	Schedule de-weeding and desilting activities during the dry season to minimize water disturbance			Prior to start of operation	
15.	Confirm that desilting is planned to avoid sensitive areas such as spawning grounds, nesting sites,			Prior to start of operation	
16.	Ensure sediment barriers (e.g., silt curtains) are used around the desilting areas to prevent suspended solids from spreading.			Daily during operation	
17.	Confirm that excavated earth material is prioritized for bund strengthening, following suitable engineering analysis			Daily during operation	
18.	Air/Dust under control plan is in place			Daily	
19.	PUC of construction vehicle checked			Monthly	
20.	Excavated soil properly placed within minimum space			Daily	
21.	Check that desilted material is stored in designated areas before reuse.			Daily during desilting operation	
22.	Confirm that desilted material is used primarily for bund strengthening and is transported in lined or covered vehicles to avoid spillage			Daily during operation	
23.	Verify that harvested weeds are collected and Store at designated place only			Daily during operation	
24.	Check that all composting activities health and safety standards to avoid contamination and environmental impact			Daily during operation	

Sl.No.	Action/Activities	Status (Yes/No)	Additional Measures required as per EMP	Frequency	Remarks
25.	Construction area is confined; no traffic/pedestrian entry observed			Daily	
26.	Surplus soil/debris/waste is disposed without delay as per provisions mentioned in EMP			Daily	
27.	Tarpaulins used to cover sand and other loose material when transported by vehicles after unloading, wheels and undercarriage of vehicles cleaned prior to leaving the site			Daily	
28.	Noise control measures taken at site			Daily	
29.	Drainage and storm water management measures are in place			Daily	
30.	Hazardous waste viz. lubricant/Oil management is being done by EMP measures			Daily	
31.	whether landslides/erosion prone area, stability of bank checked?			Daily	
32.	Any discharge of wastewater from construction site/labour camp?			Monthly	
33.	Are there any oil spillages/leakages?			Daily	
34.	No pipes disturbed/removed during excavation			Daily	
35.	No chance finds encountered during excavation			Daily	
36.	Work is planned in consultation with village administration			Prior to start of construction and monthly thereafter	
37.	Trenches are not kept open unduly			Daily	
38.	No public/unauthorized entry observed in work site			Daily	
39.	Safety measures (barricades, security) in place at work sites			Daily	
40.	Workers using appropriate PPE (boots, masks, gloves, helmets, ear muffs etc)			Daily	
41.	Workers conducting or near heavy noise work is provided with ear muffs			Daily	
42.	Is contractor staff following standard and safe construction practices?			Daily	
43.	First aid facilities are available on site			Daily	
44.	Drinking water provided at the site			Daily	
45.	Toilet facility provided at the site Separate toilet facility is provided for women workers			Weekly	
46.	Worker's camp (if any) is maintained cleanly adequate toilet and bath facilities provided			Weekly	
47.	Contractor employed local workers as far as possible			Prior to start of construction and monthly thereafter	
48.	Whether any incident of poaching/hunting/forest fire/mass fishing?			Monthly	
49.	Keep the photographic /video records of each of the project activities			Daily	

Annexure 2: Sample Material Collection Register (to be used by contractor to maintain the record for construction material)

Subproject Name:

Location of Borrow/Quarry:

Geographical Coordinates:

Estimated Quantity Required for Subproject (MT):

Whether Quarry/borrow area Approved by Government:

Date	Material Lifted from Borrow/Quarry site (MT)	Material consumed in construction (MT)	Material available at construction site (MT)	Remarks	Signature of construction manager/ site in-charge