GOVERNMENT OF ASSAM

Assam Integrated River Basin Management Program (AIRBMP) – Phase 1

Environment and Social Impact Assessment
Emergency River Works in Moinbori

December 2023

FREMAA

Flood and River Erosion Management Agency of Assam (FREMAA)

Guwahati, Assam

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Abbreviations	Abbreviations description
ADC	Autonomous District Council
AE	Anti-Erosion
AIRBMP	Assam Integrated River Basin Management Program
AP	Affected Person
ASDMA	Assam State Disaster Management Authority
ASPCB	Assam State Pollution Control Board
BC	Backward Classes
BOD	Biological Oxygen Demand
BPL	Below Poverty Line
CAMPA	Compensation Afforestation Funds Management and Planning Authority
CEO	Chief Executive Officer
CHS	Community Health and Safety
COVID-19	Coronavirus Disease – 2019
CPCB	Central Pollution Control Board
CPGRAMS	Centralized Public Grievance Redress and Monitoring System
CPR	Common Property Resources
CQRT	Circle Quick Response Teams
dB	Decibel
DC	Deputy Commissioner
DFO	Divisional Forest Officer
DG	Diesel Generator
DLAC	District Land Acquisition Committee
EAP	Externally Aided Projects
EHSGS	Environmental Health and Safety Guidelines
ESCP	Environmental and Social Commitment Plan
ESF	Environmental and Social Framework
ESS	Environmental and Social Standard
ESHS	Environmental Social Health and Safety
ESIA	Environmental and Social Impact Assessment

Abbreviations	Abbreviations description
ESMF	Environmental and Social Management Framework
FGD	Focus Group Discussion
FREMAA	Flood and River Erosion Management Authority of Assam
GBV	Gender Based Violence
GBV-SEAH	Gender Based Violence – Sexual Exploitation Abuse Harassment
GoA	Government of Assam
GOI	Government of India
GRM	Grievance Redressal Mechanism
HIV/AIDS	Human immunodeficiency virus infection and acquired immune deficiency syndrome
IAS	Invasive alien species
IEC	Information Education Communication
IFRMP	Integrated Flood Risk Management Plan
IMD	Indian Meteorological Department
TDF	Tribal development framework
IWRM	Integrated Water Resources Management
LC	Least Concern
LLW	Lowest Low Water
LMP	Labour Management Procedures
LPG	Liquefied Petroleum Gas
MIS	Management Information System
MLA	Member of Legislative Assembly
MoEF&CC	Ministry of Environment & Forest & Climate Change
MPA	Multiphase Programmatic Approach
MPL	Maximum Permissible Limit
MSDS	Material Safety Data Sheet
NAMP	National Air Monitoring Programme
NFHS	National Family Health Survey
NGO	Non-Governmental Organization
O&M	Operation and Maintenance

Abbreviations	Abbreviations description
OHS	Occupational health and safety
OHSMP	Occupational health and safety management plan
PAP	Project Affected Person
pH	Potential of Hydrogen
PIU	Project Implementation Unit
PMTC	Project Management Technical Consultancy
PMU	Project Management Unit
PPE	Personal protective equipment
PVC	Polyvinyl chloride
PWD	Person with Disabilities
PWD	Public Works Department
RAP	Resettlement Action Plan
RFCTLARR Act 2013	Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act 2013
RPF	Resettlement Policy Framework
SC	Scheduled Caste
SEA & SH	Sexual Exploitation and Abuse and Sexual Harassment
SEIAA	State Environmental Impact Assessment Authority
SEP	Stakeholder Engagement Plan
SHG	Self Help Group
SOP	Standard Operating Procedures
ST	Scheduled Tribes
STI	Sexually transmitted infections
WB	World Bank
WHO	World Health Organization
WRD	Water Resources Department

Executive Summary

Introduction

The AIRBMP is a three-phased Multiphase Programmatic Approach (MPA). The first phase of the Program (This Project) focuses on non-regrettable[1] and urgent flood and erosion project works. During the succeeding phases, i.e., phases 2 and 3, which will be processed and treated as separate project and more works will be taken up after the river basin management plan is prepared.

Description of the Subproject – Barpeta District

The Beki River is one of the right bank tributaries of the Brahmaputra River, which flows down from the Bhutan region, but a large portion flows in Assam. Frequent devastating floods lead to severe erosion in the Moinbori area of Beki River. It is proposed to take up emergency flood control measures such as Anti-Erosion & Porcupine installation works totaling a length of 8.50 Km[2]. The most vulnerable reach of 5.410 km has been decided to be taken up for the immediate AE initiatives. The six targeted priority villages proposed for AE works under Moinbori area are Hatchara, Paschim Moinbori, Kismat Moinbori, Joypur, Sikartari, and Tarakandi. In addition, village Takakata & Chikni is proposed for installation of porcupine where no land acquisition is required. The location of the riverbank protection work sites and type of interventions proposed are shown in the following table. Map of proposed sites may be found in Figure 2-3. of chapter- 2.

List of proposed sites for riverbank protection works.

Sr. No.	Location	Types of work proposed	GPS Coordinates		Reach Length (m)
			Starting Lat / Long	Ending Lat Long	
1	Jaurimari	Porcupine	26°15’36.81” N 90°48’9.02” E	26°15’24.34” N 90°47’22.24” E	1400
2	Takakata	Porcupine	26°15’24.34” N 90°47’22.24” E	26°15’19.58” N 90°47’3.13” E	550
3	Hatsara – R 1	Porcupine	26°15’24.68” N 90°45’58.87” E	26°15’12.40” N 90°45’37.11” E	725
4	Hatsara – R 2	Anti Erosion	26°15’12.40” N 90°45’37.11” E	26°15’1.85” N 90°44’47.28” E	1450
5	Kismat Moinbori – R 1	Anti Erosion	26°15’1.85” N 90°44’47.28” E	26°15’2.55” N 90°44’41.29” E	170
6	Kismat Moinbori – R 2	Anti Erosion	26°15’2.55” N 90°44’41.29” E	26°14’56.17” N 90°44’6.37” E	997
7	Kismat Moinbori – R 3	Anti Erosion)	26°14’56.17” N 90°44’6.37” E	26°14’54.52” N 90°44’0.14” E	180
8	Joypur – R 1	Anti Erosion	26°14’54.52” N 90°44’0.14” E	26°14’50.23” N 90°43’44.69” E	457
9	Joypur – R 2	Anti Erosion	26°14’50.23” N 90°43’44.69” E	26°14’45.05” N 90°43’28.80” E	473

[1]The Program will finance an extensive array of flood and river erosion control infrastructure, new and upgraded embankments, river erosion control works, which will be selected based on a comprehensive Integrated Flood Risk Management Plan (IFRM). However, in Phase 1, since no IFRMPs exist, the investments will be limited to “no-regret investments” consisting of strengthening existing flood embankments and critical river erosion works. Investments in Phase 2 and 3 will be guided by the IFRMPs.

[2] With variation of existing contract under Beki Package – 1 Lot – 2 in identified critical reaches of Beki River under Moinbori area within Kalgachia Revenue Circle of Barpeta district.

10	Tarakandi – R 1	Anti Erosion	26°14'45.05" N 90°43'28.80" E	26°14'39.38" N 90°43'10.95" E	523
11	Tarakandi – R 2	Anti Erosion	26°14'39.38" N 90°43'10.95" E	26°14'20.32" N 90°42'35.70" E	1160
12	Tarakandi – R 3	Porcupine	26°14'20.32" N 90°42'35.70" E	26°14'21.01" N 90°42'20.86" E	417

Objectives and Coverage of the ESIA

The proposed riverbank protection works for control of riverbank erosion in Moinbori of Beki River includes(i) construction of apron with sand-filled geobags, (ii) revetment with geo-bags over geo filter media and toe key with PVC coated crates filled with geobags and (iii) launching of porcupines. These works will be carried out in 12 reaches for a total length of 8.50 km in the Moinbori of Barpeta district The Anti-erosion works will comprise the controlled placing of crates filled with geobags and dumping of Geo-bags below Lowest Water level as an apron, placed over the geotextile filter media as a revetment. In the transition zone between the revetment and the falling apron, at the lowest water level (LWL), a toe key will be constructed with wire-netting boxes filled with geobags as per specifications and drawings. Concrete porcupines will also be installed at selected stretches. This emergency riverbank protection works has been proposed to be executed within 4 months with effect from January'2024 and to be completed within April'2024, so that vulnerable reaches and affected areas get protected before the monsoon.

The main objective of this ESIA is to assess the environmental & social (E&S) risks and impacts of the Moinbori Anti-Erosion (AE) works and to prepare site specific ESMP to mitigate and manage the identified E&S risks and impacts.

Legal and Regulatory Framework

The proposed Sub-Projects are being prepared and will be implemented in compliance with applicable environmental and social laws and regulations of the Government of India (GoI) and the Government of Assam (GoA) and World Bank's Environment Social Framework (ESF). Environment Protection Act/ Rules 1986 and amendments, Water Prevention and Control of Pollution) Act, 1974, 1988, Air (Prevention and Control of Pollution) Act, 1981, 1987, The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013, Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 are key act/rules along with other relevant act as per the provision of Government of India & Assam shall be applicable for the project. As per the Ministry of Environment, Forests and Climate Change (MoEF&CC) of GoI's Environmental Impact Assessment (EIA) Notification 2006, Anti Erosion works does not require any EIA or approval from MoEF&CC or Assam State Pollution Control Board (ASPCB).

Environmental and Social Baseline

The project area map prepared with 10 km buffer from Moinbori sub projects reaches indicates total area of approx.31416 ha. About 23% of the land use in the project influence area is water bodies, 20.3% is temporary sandbar, 11.3% is buildup area and 10.85% is sand bar with settlements.

The physical environmental monitoring for Air, Water, Noise and Soil quality was not undertaken during the survey while preparing the ESIA report. The contractor is requiring conducting baseline study before the start of civil works and the result of that study shall be taken as baseline. Accordingly environmental monitoring shall be conducted, and mitigation measures shall be implemented.

Biodiversity

With 10 KM buffer zone from proposed work sites, only 0.59% falls under the forest cover. The Manas National Park situated at a distance of approx. 45 km from the project location, none of the proposed

reaches falls under any eco sensitive zone (National Park/wildlife sanctuary). There are no active dolphin breeding sites near the proposed locations for emergency works in the Beki River.

Stakeholder Engagement and Consultation

16 FGDs were conducted during November and December 2023, as a part of preparation of ESIA in all the subproject site villages. This process saw participation from the villagers, and affected persons, including women and the vulnerable. The participants include about 151 men and 66 women.

During the consultations, relevant information in local language was shared with the stakeholders to give them information on the project objectives and activities and seek their feedback and concerns. Their main concerns included urgent commencement and early completion of sub-project to arrest further loss of land, lives and assets, compensation for land, work opportunities, possible eviction of squatters, etc.

Environmental and Social Impact

Based on the assessment of the Environmental Screening, the proposed sub-projects under Moinbori have been categorized as moderate risk from an environmental perspective. However, taking into account the number of Project Affected Persons (PAPs) and the necessity for resettlement and rehabilitation, it has been classified as substantial risk under social safeguards. A concise summary of the environmental and social risks associated with the proposed sub-projects, categorized according to Environmental and Social Standards (ESS) criteria, is provided in the following section. The detailed descriptions are provided in Chapter 6 of this report.

E&S risks and impacts on Disadvantaged and Vulnerable persons: ESS1.

The proposed subproject activities will benefit the vulnerable persons along with other beneficiaries. Hence, low risk is anticipated on disadvantaged and vulnerable persons.

Given the subproject's nature and scale, potential environmental and social risk and impacts, and the capacity of the implementing agency to manage, implement and monitor the ESMP and the sub-project context, the sub-project has been categorized as "Substantial Risk."

E&S Risks and Impacts on Labour and Working Conditions: ESS 2

For this emergency work in Moinbori, it is estimated that a total of 210 workers for the entire 12 reaches, both skilled and unskilled, will be engaged throughout the construction period of three to four months. Approximately 80% of the workers shall be engaged from nearby villages / communities mostly unskilled from the Barpeta district and 20% of the labours will be engaged from within the state but may be from the outside of the district for some of the skilled and specialized works. About 5% of the local workers are expected to be female. The Project workers would include direct workers, Contracted workers and Primary supplier workers. The risks include non-payment of wages by contractor/sub-contractor; Non-payment of benefits (compensation, bonus, maternity benefits etc.); discrimination in employment (e.g. abrupt termination of the employment, working conditions, wages or benefits, unequal wages, gender discrimination, etc.); possibility of gender-based violence; HIV/AIDS and other sexually transmitted diseases. Some of the subproject activities such as working in the river (for placing of porcupines and under water works for anti-erosion) might be unsafe to workers if precautionary measures are not taken Considering the project location and types of activities, it seems without mitigation measures, this project may carry moderate risk on the OHS. Considering the potential impact on GBV without mitigation measures, moderate risk is expected. The influx of workers to the community may cause impacts on community health and safety, especially an increase in prevalence of diseases and social conflicts.

E&S risks and impacts relating to Resource efficiency and Pollution Prevention: ESS 3

The requirement of materials includes about 1115105 nos. of geo bags, 199399.75 sq.m of geo textiles, 93668.84 cum of borrow sand materials, and 26496 numbers of concrete porcupines for the 12 reaches. Solid waste generation due to camps would be about 20 kg per day and wastewater generation would be about 3 m^3 per day.

The works are expected to cause air, water, soil, and noise pollution, but the risk is rated to be very low. Water to be required for civil works will be sourced from the river while the drinking water for the workers shall be sourced from the ground water through tube-wells. Surface water quality might be contaminated due to accidental spills/leaks in the storage areas. These risks are rated as Low.

E&S risks and impacts relating to Community Health and Safety: ESS 4

There are six (6) villages in the project area, the impacts on community are anticipated to be minimal as project sites would be properly fenced and labour camp with storage yards shall be installed away from community to avoid collision among workers and community. Community safety awareness program shall be organized by contractor on regular basis during the construction phase. Considering the subproject nature and extent of work, significance of impact or risk on the community health and safety is anticipated to be minimal and shall be mitigated with ESMP. There shall be provision of access to river (ramp or suitable platform) to fisherman of nearby areas. Location of ramp shall be finalized in consultation with communities and as per provision of DPR.

E&S risks and impacts on Land and Assets: ESS 5

A total of 9.87 Ha of land is required for the proposed river works which includes both Government land 1.10 Ha and Private land 8.77 Ha. There are total of 206 affected households, spread over 6 villages in Moinbori area (14 in Hatchara, 58 in Paschim Moinbori, 24 in Kismat Moinbori, 27 in Joypur, 18 in Sikartari and 65 in Tarakandi); out of the mentioned total number of affected persons, 181 are title holders and 25 are non-title holders. In terms of structures, it has been found that a total of 62 structures spread over 6 targeted villages are envisaged to be impacted due to execution of riverbank anti-erosion works. Out of the total mentioned number of structures, 61 are residential (36 are title holders and 25 non-title holders), 01 structure has been found to be of residential cum commercial nature belonging to 01 number of title holder and 02 cattle sheds which belongs to the title holders. Out of the total number of 62 structures (including 01 residential cum commercial structure) getting impacted, the magnitude of impact is more than 50% (may be considered as 100%) for 58 structures and less than 50% in 4 structures (including 01 residential cum commercial structure). In addition, a total number of 1354 trees (64 in Hatchara, 832 in Paschim Moinbori, 112 in Kismat Moinbori, 113 in Joypur and 213 in Tarakandi) need to be fell down for execution of project work. Only one common property resource - the boundary wall of a Masjid in village Tarakandi will be affected. A RAP is prepared to mitigate all these impacts.

E&S risks and impacts relating to Biodiversity& Living Natural Resources: ESS 6

The subproject area is far away (approximate 45 Km) from the boundary of the buffer zone of Manas National Park. The forest cover in the 10km buffer zone as per the Land Use Land Cover map is 0.59%. All the 1354 trees (including herbs and shrubs) to be cut down for the project works in the non-forestland come under list of tree species exempted from obtaining prior permission for felling and conversion under Schedule-I & II of 'The Assam Trees Outside Forest (Sustainable Management) Rules, 2022 as per official gazette notification published on 2nd January'2023. Hence, no compensation shall be required to be paid to the forest department for these felling numbers of trees. All trees belong to the land owned by title holders and non-titleholders.

The worksites are in heavily modified habitats such as seasonal cropping, grazing lands and settlements. Hence no impact on wildlife habitat and their movement envisaged due to proposed construction activities.

Construction activities in the river will increase sediment loading, and changes in turbidity will adversely impact fishes and aquatic animals. The risk is assessed to be moderate and shall be mitigated with specific ESMP.

E&S risks and impacts relating to Indigenous People: ESS7

None of the sites under the emergency work fall in scheduled tribal areas Further as all the households belong to minorities group (Muslim OBC) none of are indigenous peoples/tribal meeting the criteria as outlined in ESS7.

E&S risks and impacts relating to Cultural Heritage: ESS8

One CPR (boundary wall of Mosque) is affected at Tarakandi village of Monibori sub project, details are provided in RAP. A chance finds procedure is introduced in the ESMP to address if any new affected CPR is identified during the execution of work.

Environmental and Social Management Plan

The ESMP prepared includes mitigation measures, monitoring plan, responsibilities and reporting system and budget. The activity wise anticipated environmental and social impacts and corresponding mitigation measures as per ESS are given in the annexure I. Compliance monitoring will be conducted in accordance with the environmental and social mitigation measures and monitoring plan provided. Several physical, biological, and social components which are of particular significance to the proposed project are listed as monitoring indicators. PIU will initiate action for any non-compliance with the implementation of ESMP and regarding major lapses, including penalties. The summary of site-specific mitigation measures to mitigate identified significant adverse impacts are given in below table:

E&S standards	Impact / Risk	Mitigation measures
ESS 2	Occupational health and safety risks during construction	• All personnel working on-site will be provided with and required to wear PPE at all times during work activities. • The contractor will deploy OHS expert to supervise and monitor health and safety practices at the site. • A comprehensive job hazard analysis will be conducted prior to commencing work, and appropriate mitigation measures will be implemented accordingly. • Regular site visits and inspections will be conducted by the PMU /PIU/ PMTC to ensure compliance with ESMP & OHS.
	Employment opportunities in construction activities	• All unskilled workers shall be engaged from nearby villages.
	O&M related risk	NA
ESS-3	Impacts from borrow activities	• The contractor will be required to use only approved sites for sand mining. • Borrowing/mining activities will be limited to fewer areas to reduce the area extent affected by borrowing activities
	Generation of construction hazardous waste	• Very negligible amount of hazardous waste will be generated, and it will be disposed of through authorized recyclers to ensure proper management and compliance with regulations.
	Generation of solid waste	• Wet waste will be disposed of through composting methods, while dry or recyclable waste will be sold to authorized recyclers for recycling and disposal
	Air and noise pollution from construction	• Regular sprinkling to suppress dust emission. • All vehicles will be mandated to have PUC certification. • Silent DG will be used. • Work activities will be restricted to daytime hours only.
	Generation of spoils	• The excavated soil will be disposed of in low-lying areas towards the countryside with the approval of the WRD
ESS 4	Impact on public utilities	• As there are utilities (Electric poles and transformers) near the construction sites, these will be cordoned off from the

E&S standards	Impact / Risk	Mitigation measures
		workers, equipment, and vehicles so as not to cause any damage to these utilities.
	Barrier/ severance effect	• Stairs and ramps will be constructed on the bank protection works to provide access to the river for fishers. The locations for these structures will be agreed upon with the local community.
	Safety hazards due to increased traffic	• The contractor will implement traffic diversion strategies, providing alternate routes for local traffic, and avoiding congestion during construction activities. • Road signage will be placed to mitigate safety hazards associated with project-related vehicular traffic. • Flagmen will be deployed to manage the traffic during construction activities
	Community exposure to natural disasters, work hazards, communicable diseases	• Construction areas will be barricaded with hard fencing to prevent community entry. • Adequate signboards and flagmen will redirect the community away from construction zones. • First aid medical facilities will be provided onsite, along with condom boxes/vending machines. • Awareness campaigns on STIs and communicable diseases, such as HIV/AIDS and COVID-19, will be conducted.
	Impacts of labour influx	• All unskilled workers will be engaged from nearby areas. • The awareness campaign will be conducted to educate both the resident population and the workers about the risks associated with interaction, including the spread of sexually transmitted diseases such as HIV/AIDS. • Worker Code of Conduct will be implemented by the Contractor to regulate the behaviour of workers on-site, in camps, and within local communities.
	Risk of gender-based violence.	• Every worker will sign a Code of Conduct • Engage maximum workers from nearby villages. • Awareness training of WRD, contractor's staff and workers to sensitize them about SEA, and SH, and their responsibilities to prevent.
ESS 5	Land acquisition and resettlement	• RAP is prepared to address and mitigate the impacts on the affected households. • RAP implementation NGO will be engaged by FREMAA to support the compensation
ESS 6	Impacts on riverbank and aquatic habitat	• The work shall be implemented between February to May 2024. it will also minimize the extent of impacts on the river habitat and would not cause any impact on breeding of fishes which usually happens in June & July.
	Loss of trees	• Total 1354 tree to be cut under list of tree species exempted from obtaining prior permission for felling and conversion, The loss of vegetation will be compensated through cash compensation to the owners as per the RAP.

E&S standards	Impact / Risk	Mitigation measures
	Impacts on Wildlife	• Record of wildlife sittings by the Contractor near the work sites and any sightings will be informed to the local authority of the Forest Department.
	Impact on River Habitat due to Instream Construction Activities	• The geobags will be slowly released into the water at the required locations to cause the minimum disturbance to the riverbed rather than dumping from the boats. • Control of wastewater and sediment releases into the river • Ensure the boats are in good operating condition, free of leaks, excess oil and lubricants, and grease.
	Impact on Flora	• Use of non-wood fuel for cooking and heating. • Awareness-raising to workers on the protection of flora and fauna
	Impact on Fauna	• The dense vegetation will only be cleared once it has been established that any individuals present have fled.
ESS 7	NA	NA
ESS 8	Impact on Cultural Sites	• Reconstruct the Common property resources in complete coordination and participation of the affected community and in a culturally and socially acceptable manner.
	Impact on Cultural Heritage	• The contractors will use the chance find procedures when encountered with any such chance finds. The procedures are described in the ESMP.

Implementation Arrangements

The principal responsibility for implementation of ESMP and E&S risk management of AIRBMP is lies with PMU & PIU. The PMU at FREMAA headed by Chief Executive Officer has a safeguards team with an Environmental Specialist, a Social Development Specialist and a Communication Specialist, along with field supervisors in the field. Deputy Chief Executive Officer through the PMU will be responsible for the entire land procurement process. Water Resources Department (WRD) is headed by a Chief Engineer will be the Project Implementing Agency (PIU). Additional Chief Engineer, EAP is the Nodal Officer along with technical expert (Engineering), and dedicated Environment and Social expert deployed in PIU to supervise, coordinate, and finalize the technical and safeguard aspects of the project. The emergency river works under Moinbori shall be undertaken by Water Resource department, Barpeta Division which is headed by Executive Engineer. The DC Office will regulate quarries, minor mineral (sand)and water conservation activities that support river works and minimize likely adverse impacts on water resource management. DC also conducts the meeting for DLLPC (District Level Land Purchase Committee) to purchase the required land for the project. FREMAA through RAP implementation NGO will ensure that the compensation and eligible assistance as per the entitlement and provision of RAP shall be provided to the eligible PAPs/PAFs. Project Management Technical Consultant will assist FREMAA and WRD on environmental and social mitigation measures as per ESMP and compliance monitoring of the construction contractor's activities. The RAP[3] implementation NGO shall be engaged by FREMAA to facilitate RAP the implementation process during the execution of civil works. The Contractor shall be primarily responsible for the implementation and internal monitoring of all environmental and social management measures during construction, Contractor shall deploy dedicated OHS Expert to oversee the Safety compliances at site, E & S expert already engaged for Beki Package -1, Lot – 2 contracts will look after the all E & S related compliances at Moinbori project

[3] *The already engaged RAP implementation NGO for Beki river basin project may be engaged for Moinbori area with variation of existing contract and additional scope of work*

sites. The contractor shall produce a separate monthly compliance report to PIU (WRD) on the status of ESMP implementation, implement corrective actions as instructed by FREMAA, PMTC and WRD.

Budget

An estimation of ESMP budget for a period of maximum four months of civil works (January- April' 2024) has been prepared considering all the environmental and social safeguard aspects along with awareness program, trainings, health camps, environmental monitoring etc. The budget source is project funds and is approved by PMU. The ESMP budget is approximately around ₹11,08,800 (Rupees Eleven Lakhs Eight Thousands & Eight Hundreds).

Disclosure

The FREMAA will ensure that PAPs and other stakeholders are informed and consulted about the sub-project, its impact, their entitlements, and options, and allowed to participate actively in the development of the sub-project. The executive summary of ESIA shall be translated into Assamese language and distributed among PAPs and beneficiaries. After approval of ESIA from World Bank, it will be disclosed on the FREMAA, ASDMA and World Bank external websites.

1 Introduction

1.1 Project Description

1. AIRBMP is a twelve-year program with total WB financing of US$500[4] million with three overlapping phases. The present project is Phase 1 of the program is an IPF (Investment Project Finance) with WB financing of US$108 million. Phase 2 and Phase 3 of the program will be supported by WB financing of around US$192 and US$200 million. The Project Development Objective (PDO) of phase 1 is to "strengthen institutional capacity to improve integrated water resources planning and management and to build resilience to flood and erosion risks in Assam." The first phase of the project focuses on non-regrettable and urgent flood and erosion project works during the succeeding phases, i.e., phases 2 and 3, and more work will be taken up after the river basin management plan is prepared.

1.1.1 Project Components

2. The first phase of AIRBMP is a four-year project comprises of four components as listed below:

   - Component 1: Institutional Strengthening and Strategic Studies (US$20 million). This component focuses on institutional strengthening of WRD and ASDMA.
   - Component 2: Water Resources Management (US$80 million). This component will finance the structural and non-structural activities to reduce flood and river erosion risks in selected sub-basins and establish a foundation for IWRM.
   - Component 3: Disaster Risk Management (US$35 million). This component strengthens Assam's overall disaster risk management capacity.
   - Component 4: Contingent Emergency Response Component (US$ 0): This allows an immediate response to an Eligible Crisis or Emergency, as needed, from other components to partially cover emergency response and recovery costs. This component could also be used to channel additional funds should they become available because of the Emergency.

1.2 Emergency river works proposed in Beki River at Moinbori sub projects.

3. Beki River (also known as the Kurissu River in Bhutan) is one of the right bank tributaries of the mighty River Brahmaputra which flows down from the Bhutan region but a large portion flows in Assam. The riverbank at Moinbori areas is eroding faster and causing damage to Agricultural land, public property, private property and affecting nearby communities. The objective of undertaking Moinbori emergency work is to rehabilitate the degraded lands and reduce long term erosion vulnerability in targeted areas emboldened in the project components. It is proposed to take up emergency flood control measures as Anti-Erosion & porcupine works totaling a length of 8.50 Km in identified critical reaches of villages under Moinbori of Barpeta district. The emergency works at Moinbori is proposed to be executed under component 2.1 (c.) small urgent and high priority river works. This work shall be implemented by contract variation of existing river work contract of Beki Package – 1 Lot – 2.

[4] *Project Appraisal document, AIRBMP*

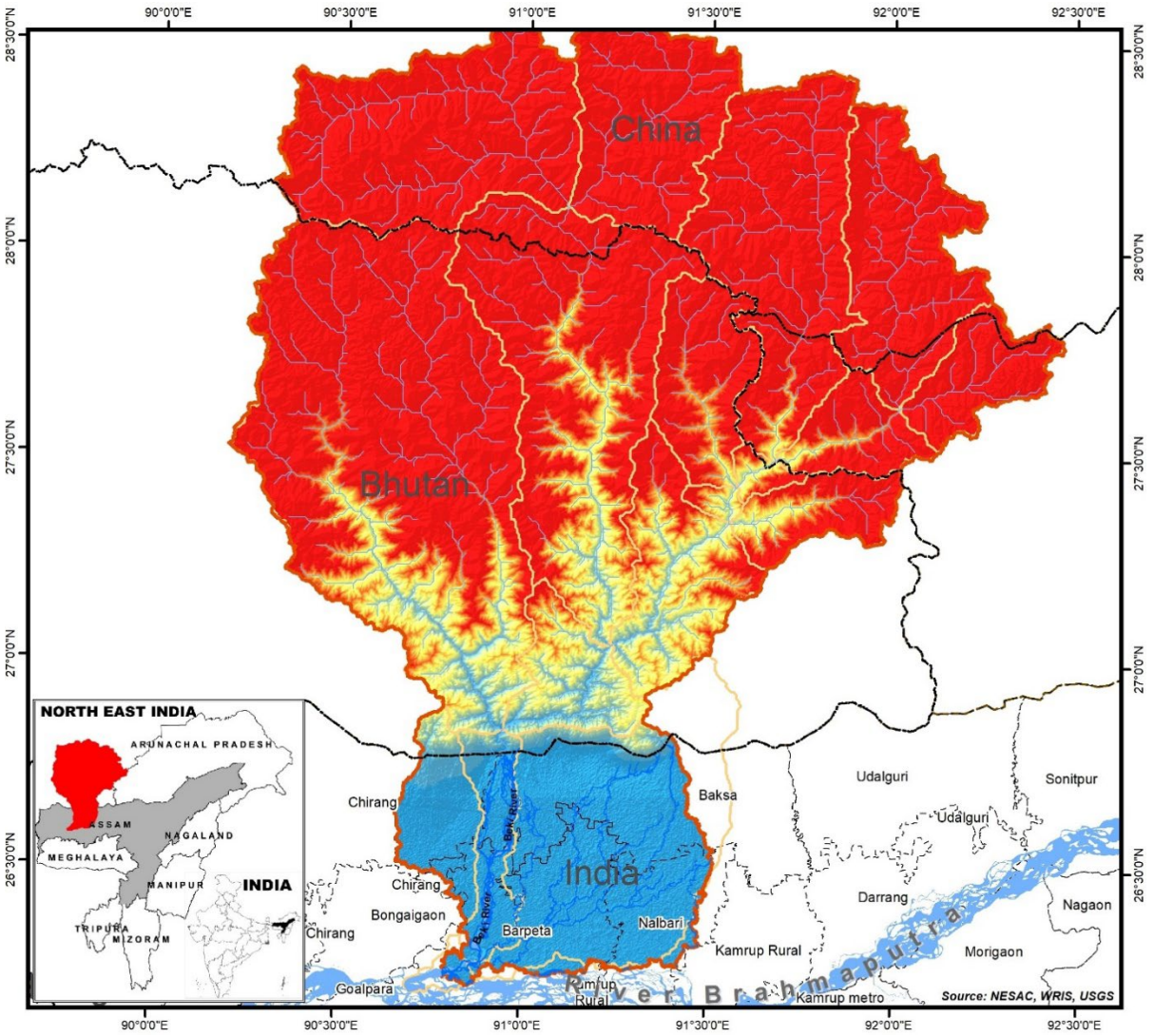


Figure 1-1: Beki Basin Map

1.3 Environmental and Social Impact Assessment (ESIA) Study of the Sub-Project

4. The Objective of the ESIA is to assess E&S risks and impacts of the AE works for Moinbori and to develop and implement mitigation measures following a mitigation hierarchy. The other objectives of ESIA of the project are:

   - A comprehensive description of the current natural environment and socio-economic conditions in the subproject area.
   - Identification of potential impacts of the project on the natural environment and socioeconomic conditions of the population during its entire cycle i.e., from pre-construction to construction and operation and maintenance. The ESIA concentrates on the analysis and scientific assessment of the physical, biological, and socioeconomic impacts of the subproject when it is implemented.
   - Identifying the capacity constraints of the Implementing Agencies in respect of E&S management and propose commensurate capacity enhancement measures, among others.
   - Providing recommendations that are technically feasible and culturally appropriate measures within legal and regulatory framework and World Bank ESF, towards effective

management of adverse E&S impacts of the project on the natural environment and people during the pre-construction and construction phase.

1.4 Approach for the ESIA study

5. The approach adopted for conducting the environmental and social impact assessment for the proposed project was through a) review of interventions proposed in Anti Erosion measures , conformation of revenue records from the district administration and authorities for RoW details and ownership assessment to confirm if there are any associated facilities, b) site visits, and Environmental screening of proposed sub projects ,c) consultations with stakeholders, d) field surveys including household level census and socio-economic surveys through pre-tested questionnaires, and e) analysis of data and report compilation, The existing environmental and social conditions in and around the project area were analyzed, environmental and social impacts of project components and activities were assessed, and mitigation/ management measures were proposed

6. The Baseline data were collected through site visits and on a sampling basis, interaction with local people and discussion with project authority, stakeholder consultation, collection of data from relevant project records, collected data from secondary sources and analysis. The studied parameters include pre-project Socio–economic status of the people of study area. The primary baseline information on different social and environmental components was collected through field survey. Field surveys were carried out to collect information on the major social and environmental features such as human settlements, trees, water bodies, sensitive locations, etc. Literature and authentic records were consulted to study the Environment & Socio–Economic status concerning the study areas. Status of pre-project social and environmental conditions was considered in three aspects, i.e., (1) physical environment, (2) biological environment and (3) social environment.

7. The key assessment approach includes:

   i. Identification and analysis of positive and negative environmental and social impacts – the significance of these impacts, which are to result from project interventions and associated facilities, if any.

   ii. To adopt a mitigation hierarchy approach to the project's E&S risks, i.e., a) anticipate and avoid risks and impacts; b) minimize or reduce risks and impacts to acceptable levels, if not avoidable; c) once risks and impacts have been minimized or reduced, mitigate; and (d) where significant residual impacts remain, compensate for or offset them, by identifying technically and financially feasible and cost-effective mitigation/ management measures to minimize negative impacts and enhance positive impacts, including changes to engineering designs.

   iii. To identify differentiated impacts on the disadvantaged or vulnerable and to identify differentiated measures to mitigate such impacts, wherever applicable

   iv. Exploration of the opportunities for environmental and social enhancement.

   v. Preparation of Environmental and Social Management Plan, as well as Resettlement Action Plan, for effective implementation of mitigation/ management measures at different stages of the project, i.e., pre-construction, and construction

   vi. Assessment of existing capacities and proposing commensurate measures to fill capacity gaps.

1.5 Structure of the Report

8. The ESIA report is presented based on the following structure:

   - Chapter 1: Introduction
   - Chapter 2: Subproject Description

2 Sub-Project Description

This chapter deals with the description of the existing condition of riverbank within Monibori areas and proposed interventions.

2.1 Description of the Existing Conditions in the Subproject

9. Due to the dynamic behavior of the Beki River, active river erosion causes annual continuous shifting of the Bankline at Moinbori, thereby eroding a greater area year by year. River erosion threatens all six villages of Moinbori, putting residential settlements, schools, and religious buildings at risk of being eroded by the river if no further improvements to protect the riverbanks from river erosion are undertaken soon. Beki River right bankline along Moinbari has shifted over 3 km since 2008 (Figure 2-1). Current bankline at immediate upstream of Moinbari (which is shifting towards river side) is creating adverse erosion condition at Moinbari and its adjacent locations identified for the emergency works under AIRBMP.

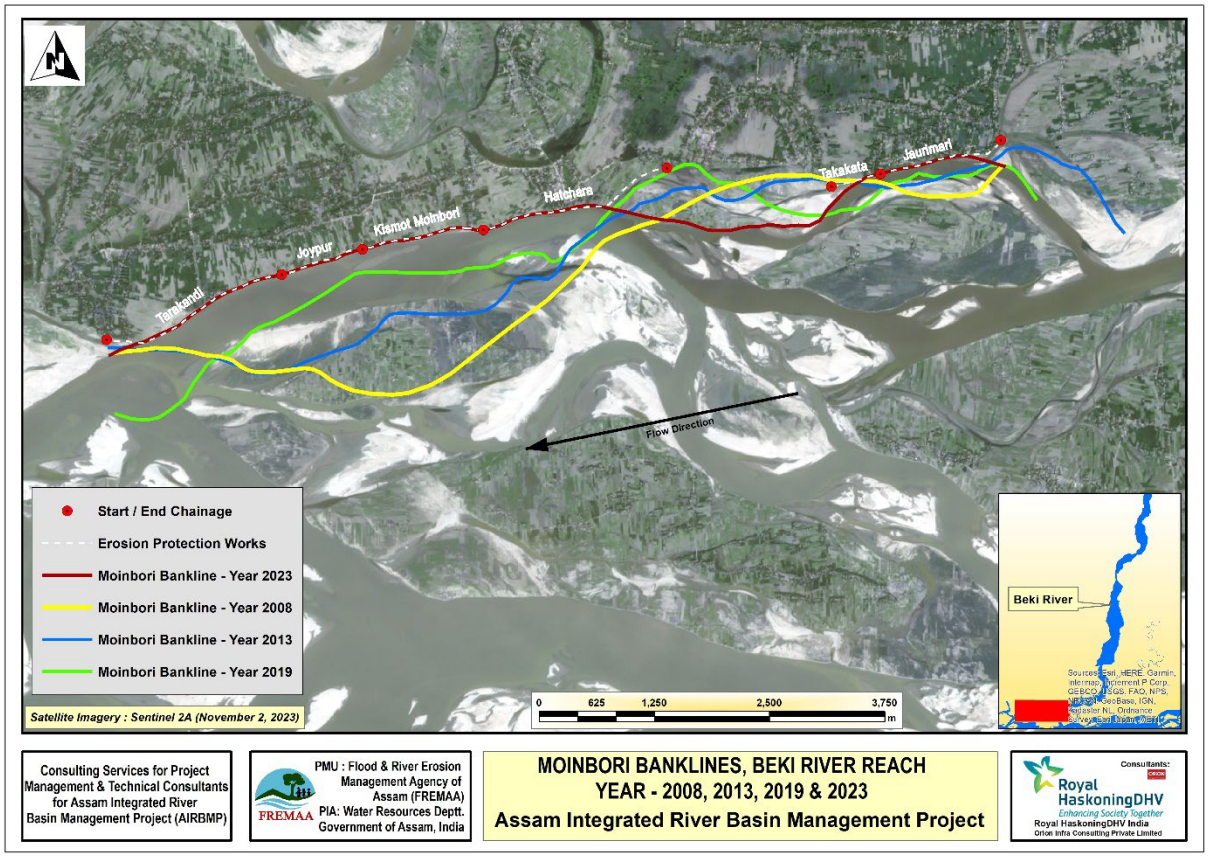


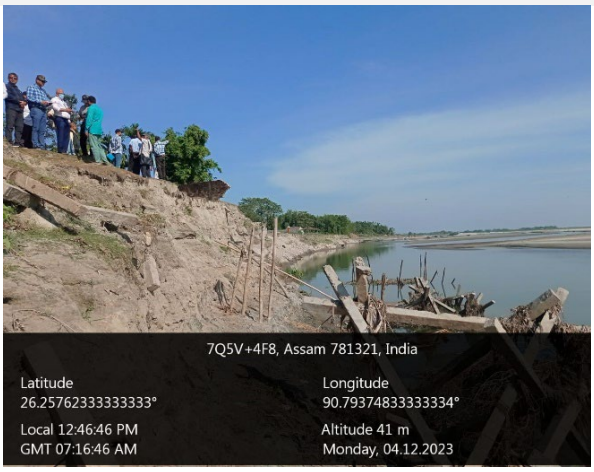
Figure 2-1 Beki River right bankline shifting along Moinbari reach (period: 2008-2000)

The hydrodynamic modeling study was conducted to evaluate the impact of riverbank erosion in the villages of Moinbori areas. The study aimed to propose suitable protective measures based on the findings of the model study. The protection plan involves a combination of two types of works: anti-erosion measures using geo-bag revetment and porcupine structures.

The selection between geo-bag revetment and porcupine structures is based on the hydraulic severity of the river, considering factors such as water depth, velocity, shear stress, and the obliquity of flow direction towards the riverbank. The decision on whether to implement geo-bag revetment or porcupine structures is made by carefully evaluating these hydraulic parameters, ensuring that the chosen protective measures are well-suited to the specific hydrodynamic conditions of the site. This approach aims to provide effective protection against riverbank erosion in the Moinbori areas.

The photographs showing existing condition of the locations proposed for riverbank protection works in the subproject area is shown in Figure 2-2

Jaurimari

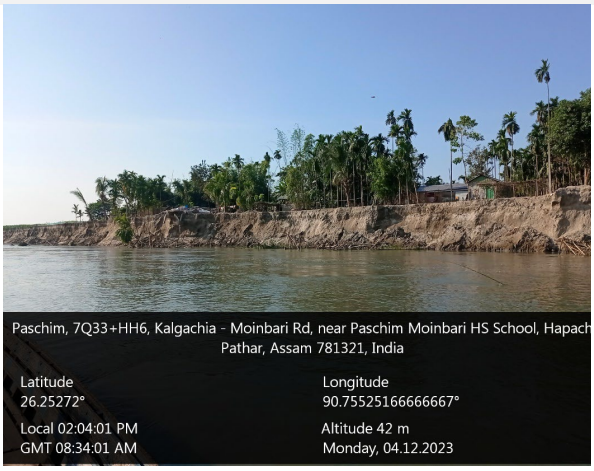


Tarakata

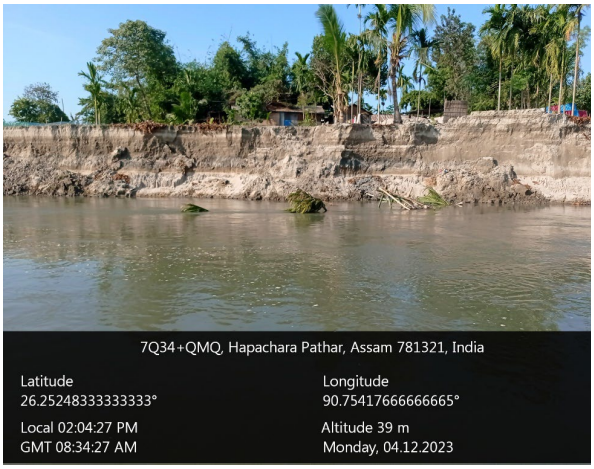
Hatsara Reach – 1

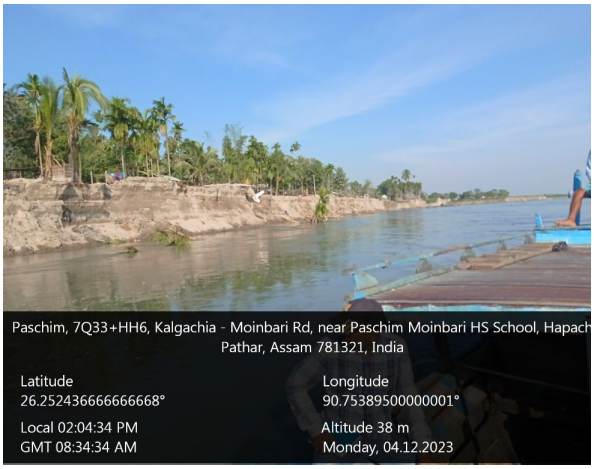
Hatsara Reach – 2

Kismat Moinbari Reach-1

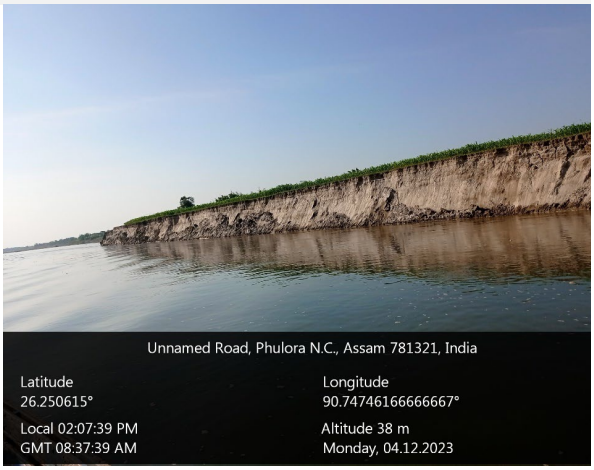


Kismat Moinbari Reach-2

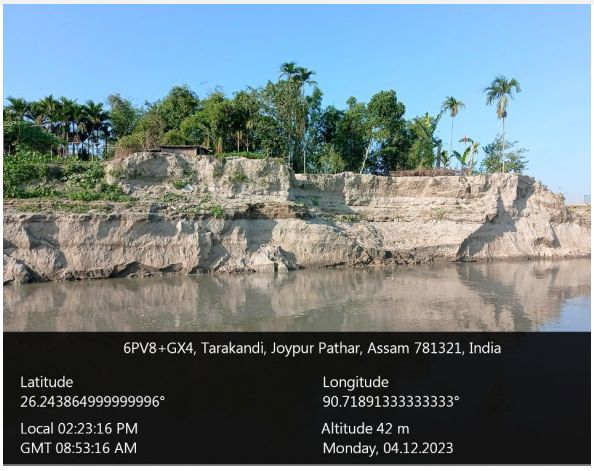


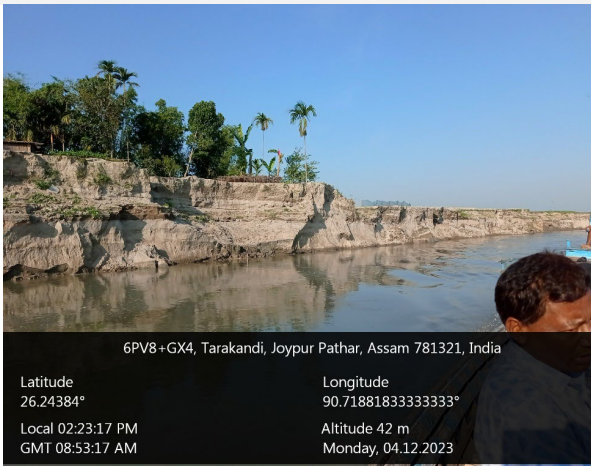


Kismat Moinbari Reach-3

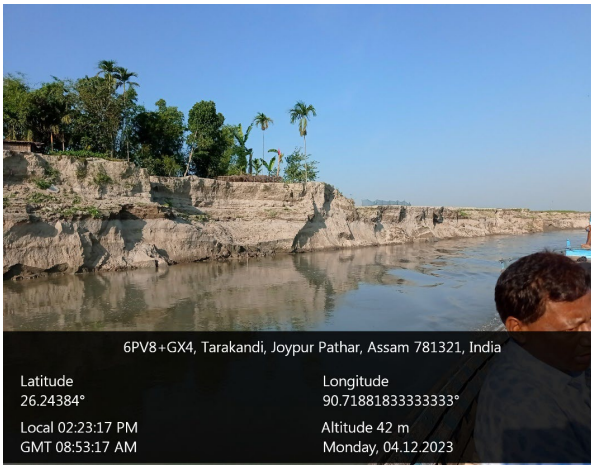


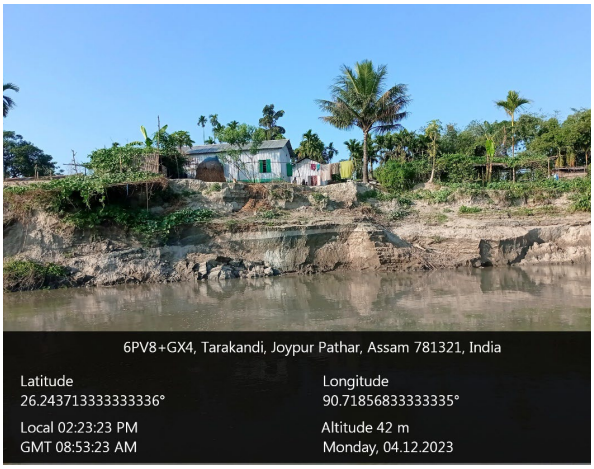
Joypur Reach – 1





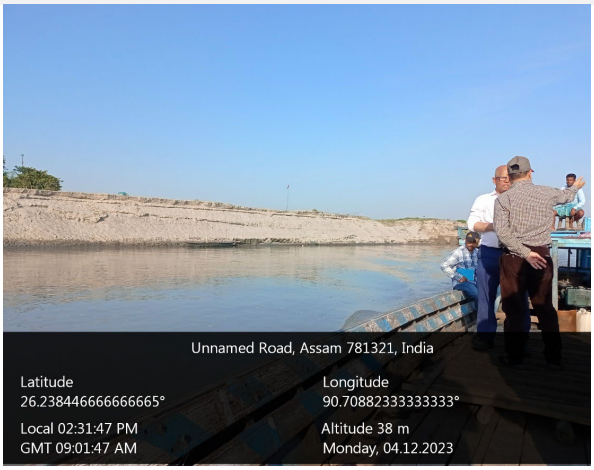
Tarakandi Reach – 2





Tarakandi Reach-1

Tarakandi Reach 2



Tarakandi Reach 3

Figure 2-2: Current Condition of the riverbank at Moinbori areas

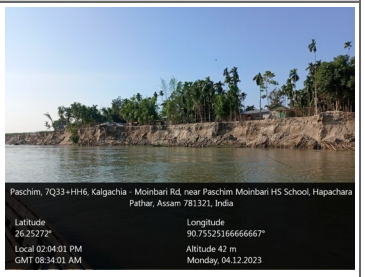
2.2 Proposed Interventions

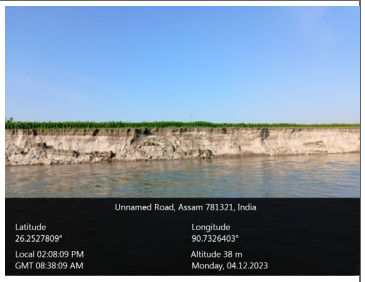
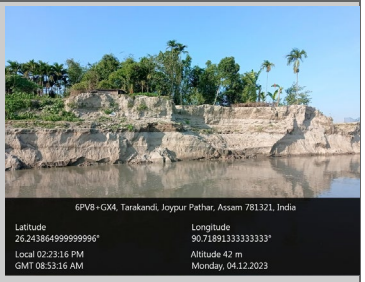
10. Considering the current conditions, WRD proposes urgent emergency protection of the most vulnerable riverbanks, causing erosion and impacting nearby communities and public infrastructures. The proposed riverbank protection works for control of riverbank erosion include

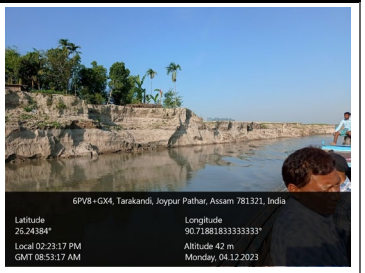
construction of (i) apron with sand-filled geo-bags, (ii) revetment with geo-bags over geo filter media and toe key with PVC coated crates filled with geo-bags and (iii) launching of porcupines. These works will be carried out in 12 reaches for a total length of 8.50 km, in Moinbori area of Barpeta districts with contract variation under existing contract of Beki Package – 1, Lot – 2 . The detailed locations are given in Table 2-1, and location maps are given in Figure 2.2

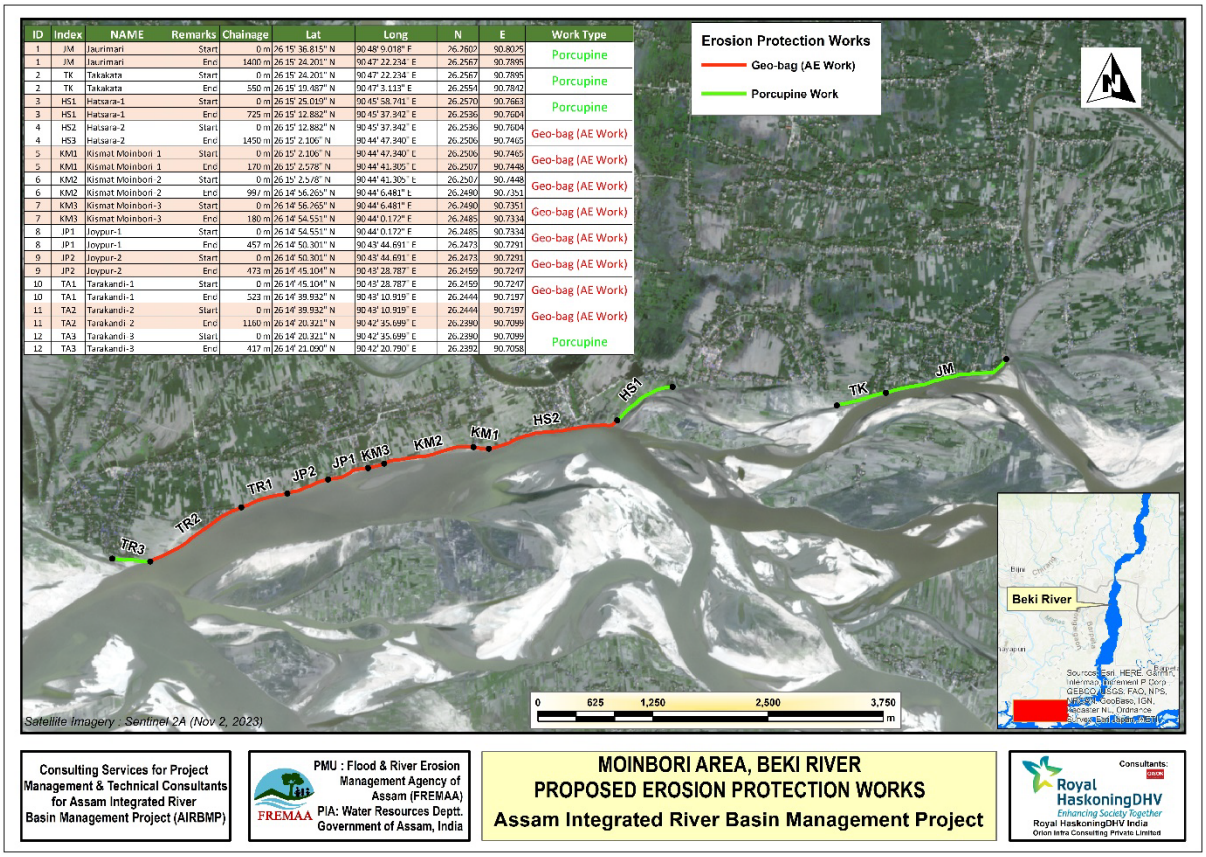
Table 2-1: Locations of Emergency Riverbank Protection Works (Anti-Erosion Works using Geo-bags & Launching of Porcupines), at Moinbori area of Barpeta Water Resource Division

Sr.No.	Location	Types of work proposed	GPS Coordinates		Reach Length (m)	Site Photograph
			Starting Latitude, Longitude	Ending Latitude, Longitude		
1	Jaurimari	Porcupine	26°15’36.81”N 90°48’9.02”E	26°15’24.34”N 90°47’22.24”E	1400	
2	Takakata	Porcupine	26°15’24.34”N 90°47’22.24”E	26°15’19.58”N 90°47’3.13”E	550	
3	Hatsara – R 1	Porcupine	26°15’24.68”N 90°45’58.87”E	26°15’12.40”N 90°45’37.11”E	725	

Sr.No.	Location	Types of work proposed	GPS Coordinates		Reach Length (m)	Site Photograph
			Starting Latitude, Longitude	Ending Latitude, Longitude		
4	Hatsara – R 2	Anti Erosion	26°15'12.40"N 90°45'37.11"E	26°15'1.85"N 90°44'47.28"E	1450	
5	Kismat Moinbori – R 1	Anti Erosion	26°15'1.85"N 90°44'47.28"E	26°15'2.55"N 90°44'41.29"E	170	
6	Kismat Moinbori – R 2	Anti Erosion	26°15'2.55"N 90°44'41.29"E	26°14'56.17"N 90°44'6.37"E	997	

Sr.No.	Location	Types of work proposed	GPS Coordinates		Reach Length (m)	Site Photograph
			Starting Latitude, Longitude	Ending Latitude, Longitude		
7	Kismat Moinbori – R 3	Anti Erosion)	26°14’56.17”N 90°44’6.37”E	26°14’54.52”N 90°44’0.14”E	180	
8	Joypur – R 1	Anti Erosion	26°14’54.52”N 90°44’0.14”E	26°14’50.23”N 90°43’44.69”E	457	
9	Joypur – R 2	Anti Erosion	26°14’50.23”N 90°43’44.69”E	26°14’45.05”N 90°43’28.80”E	473	

Sr.No.	Location	Types of work proposed	GPS Coordinates		Reach Length (m)	Site Photograph
			Starting Latitude, Longitude	Ending Latitude, Longitude		
10	Tarakandi – R 1	Anti Erosion	26°14’45.05”N 90°43’28.80”E	26°14’39.38”N 90°43’10.95”E	523	
11	Tarakandi – R 2	Anti Erosion	26°14’39.38”N 90°43’10.95”E	26°14’20.32”N 90°42’35.70”E	1160	
12	Tarakandi – R 3	Porcupine	26°14’20.32”N 90°42’35.70”E	26°14’21.01”N 90°42’20.86”E	417	



ID	Index	NAME	Remarks	Chainage	Lat	Long	N	E	Work Type
1	JM	Jaurimari	Start	0 m	26.15' 36.815" N	90.48' 9.018" E	26.7602	90.8025	Porcupine
1	JM	Jaurimari	End	1400 m	26.15' 24.201" N	90.47' 22.234" E	26.2567	90.7895	
2	TK	Takakata	Start	0 m	26.15' 24.201" N	90.47' 22.234" E	26.2567	90.7895	Porcupine
2	TK	Takakata	End	550 m	26.15' 10.487" N	90.47' 3.133" E	26.2554	90.7842	
3	HS1	Hatsara-1	Start	0 m	26.15' 25.019" N	90.45' 58.741" E	26.2570	90.7663	Porcupine
3	HS1	Hatsara-1	End	725 m	26.15' 12.882" N	90.45' 37.342" E	26.2536	90.7604	
4	HS2	Hatsara-2	Start	0 m	26.15' 12.882" N	90.45' 37.342" E	26.2536	90.7604	Geo-bag (AE Work)
4	HS2	Hatsara-2	End	1450 m	26.15' 2.106" N	90.44' 47.340" E	26.2506	90.7465	
5	KM1	Kismat Moinbori 1	Start	0 m	26.15' 2.106" N	90.44' 47.340" E	26.2506	90.7465	Geo-bag (AE Work)
5	KM1	Kismat Moinbori 1	End	170 m	26.15' 2.578" N	90.44' 41.305" E	26.2507	90.7448	
6	KM2	Kismat Moinbori 2	Start	0 m	26.15' 2.578" N	90.44' 41.305" E	26.2507	90.7448	Geo-bag (AE Work)
6	KM2	Kismat Moinbori 2	End	997 m	26.14' 56.265" N	90.44' 6.481" E	26.2490	90.7351	
7	KM3	Kismat Moinbori-3	Start	0 m	26.14' 56.265" N	90.44' 6.481" E	26.2490	90.7351	Geo-bag (AE Work)
7	KM3	Kismat Moinbori-3	End	180 m	26.14' 54.551" N	90.44' 0.172" E	26.2485	90.7334	
8	JP1	Joypur-1	Start	0 m	26.14' 54.551" N	90.44' 0.172" E	26.2485	90.7334	Geo-bag (AE Work)
8	JP1	Joypur-1	End	457 m	26.14' 50.301" N	90.43' 44.691" E	26.2473	90.7291	
9	JP2	Joypur-2	Start	0 m	26.14' 50.301" N	90.43' 44.691" E	26.2473	90.7291	Geo-bag (AE Work)
9	JP2	Joypur-2	End	473 m	26.14' 45.104" N	90.43' 28.787" E	26.2459	90.7247	
10	TA1	Tarakandi-1	Start	0 m	26.14' 45.104" N	90.43' 28.787" E	26.2459	90.7247	Geo-bag (AE Work)
10	TA1	Tarakandi-1	End	523 m	26.14' 39.932" N	90.43' 10.919" E	26.2444	90.7197	
11	TA2	Tarakandi-2	Start	0 m	26.14' 39.932" N	90.43' 10.919" E	26.2444	90.7197	Geo-bag (AE Work)
11	TA2	Tarakandi 2	End	1160 m	26.14' 20.321" N	90.42' 35.699" E	26.2390	90.7099	
12	TA3	Tarakandi 3	Start	0 m	26.14' 20.321" N	90.42' 35.699" E	26.2390	90.7099	Porcupine
12	TA3	Tarakandi-3	End	417 m	26.14' 21.090" N	90.42' 20.790" E	26.2392	90.7058	

Figure 2-3: Location Map of Riverbank Protection Works in Moinbori

2.3 Typical Cross-sections of Proposed Works

11. The typical cross-sections of the proposed anti-erosion given respectively as given below in figure 2.3.

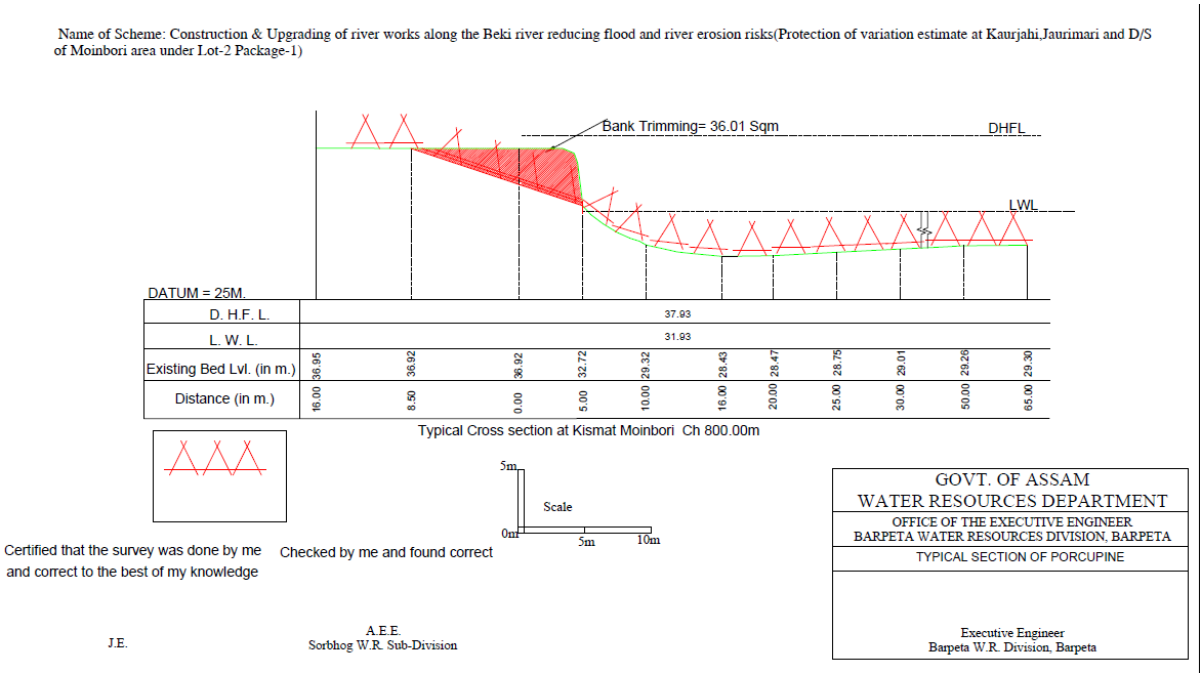


Figure 2-4: Typical Cross-Sections of Proposed Anti-Erosion Works

2.4 Typical Civil Works

12. Anti-erosion (Geobag & porcupine) works will be carried out to protect the riverbank from further erosion. The riverbank protection work will comprise the controlled placing of crates filled with geo-bags and dumping of Geo-bags below the Lowest Low Water (LLW, the lowest water level recorded over a 50-year return period) as an apron, placed over the geotextiles filter media as a revetment. In the transition zone between the revetment and the falling apron, at LWL, a toe key will be constructed with wire-netting boxes filled with geo-bags as per specifications and drawings. This protection extends below Lowest Low Water and forms a transitional berm towards the underwater slope protection. As the typical revetment works are shown in Figure 2.3. The protection extends below the Lowest Low Water and forms a transitional berm toward the underwater slope protection. Concrete porcupine[5] bars will be placed at four locations and on upstream and downstream of the site where geo bags are proposed.

Figure 2-5: Photographs of typical anti-erosion and Porcupine works.

2.5 Right of Way and Land Requirement

13. At present, there is no designated right of way (ROW) for the proposed anti-erosion works. A right of way of 18 m for the anti-erosion works has been considered for the design of the subproject. Therefore land requirement for the AE works the works out to be about 9.87 Ha, out of which 8.77 Ha is private land and 1.1 Ha is government land located in intermittent reaches. t. The cut-off date for legal title holders is the date of Notification under Section 11(1) of RFCTLARR Act 2013. The cut-off date has been set as the completion date of the survey which was different for different villages. The cut-off dates for including the PAPs were 28.11.2023 for Paschim Moinbori, 01.12.2023 for Kismat Moinbori, 08.12.2023 for Joypur, 09.12.2023 for Hatchara and Tarakandi and 30.12.2023 for Sikartari respectively. Details of cut-off dates for various reaches have been given in the RAP report. This was communicated to the affected people during the survey and consultation process. People moving into the project area after the cut-off date will not be entitled to any assistance. However, some flexibility will be considered during implementation to consider any non-titled-holders who may not have been present during the survey and who owned assets within the Area of Influence prior to the cut-off-date.

Table 2-2: Impacts due civil works at Moinbori.

Sr. No.	Particulars	Unit	Quantity

[5]*"Porcupines" is a prismatic type of permeable structure, comprises of six members of made of Reinforced Cement Concrete (RCC)/ Pre- Stressed Concrete (PSC), which are joined with the help of iron nuts and bolts. These structures are used as permeable screens which are used to dampening of the velocity to induce siltation from silt laden flow and to deposit the silt along the affected area so as to shift the flow away from the protected reach.*

1	Government Land required	Ha	1.1
2	Private Land required	Ha	8.77
3	Total Land required	Ha	9.87
4	Number of households	Number	206
6	Number of title holders	Number	181
7	Number of non-title holders	Number	25

2.6 Community Health and Safety Measures in Subproject Design

14. **Climate Change Adaptation**. The proposed works are designed based on historical hydrological data and factoring in climate change predictions.

15. A total of 1354[6] trees of various sizes, planted in non-forest land will be cut down due to the project activities., The presence of betelnut trees has been recorded as the highest among other trees in project areas. None of these trees are of threatened status. The details of trees species and their presence in project area is given below in table to be felled in proposed sub projects.

Table 2-3:Distribution of tree species to be felled in project area.

Tree Species	Nos	% of Trees
Kadam	37	2.73
Betelnut	747	55.17
Wood Apple	0	0.00
Drumstick	6	0.44
Coconut	33	2.44
Guava	30	2.22
Jackfruit	42	3.10
Litchi	3	0.22
Blackberry	4	0.29
Teak	56	4013
Jujube	15	1.11
Mango	49	3.62
Pomegranate	2	0.15
Custard Apple	0	0.00
Tamarind	0	0.00

[6] *All the 1354 trees to be cut down come under list of tree species exempted from obtaining prior permission for felling and conversion under Schedule-I & II of 'The Assam Trees Outside Forest (Sustainable Management) Rules, 2022 as per official gazette notification published on 2nd January'2023*

Tree Species	Nos	% of Trees
Timber	49	3.62
Neem	0	0.00
Gamari	115	8.50
Red Cotton	20	1.48
Olive	1	0.07
Star fruit	5	0.37
Lemon	6	0.44
Papaya	39	2.88
Sugar Apple	0	0.00
Palm Tree	1	0.07
Pipal Tree	1	0.07
Betelnut leaf	0	0.00
Others(firewood)	93	6.87
	1354	100.00

2.7 Resource Requirements

16. **Sub-Project Footprint:** The Anti-Erosion works will be implemented in 9 identified critical reaches over a land area of 9.87 Ha. This is considering an approximate width of about 18 m and a length of about 5410 m for the 9 reaches of anti-erosion works .Porcupine works will be executed in 3 reaches over a length of 3092m under the emergency works in Moinbori area.

17. **Labour**: The subproject will be implemented under variation of existing Beki Package – 1, Lot – 2 contracts. Each riverbank protection works will require 20 to 30 workers both skilled and unskilled, throughout the construction period of three to four months. Overall, about 210 workers will be required, out of which 80% of workers from nearby communities mostly un-skilled or semi-skilled labour and 20% of other workers, skilled, technical etc. from outside the district but available within the state.

18. **Construction Material Requirement**: The major construction material with quantity is given in Table2-4**.** Geobags will be procured from government-authorized vendors. The sand for the geobags will be procured from the approved borrows areas within the Beki River. The Precast porcupine shall be procured from authorized suppliers, and it shall be ensured the porcupine manufactures has used the construction material from authorized sources.

Table 2-4: Estimation of Quantities of Construction Materials

Items	Unit	A/E Works
Geobags	Number	1115105
Geotextile	square meters	199399.75

Items	Unit	A/E Works
W.N Box	Number	7215
Sewing thread	Running meter	12266155
Borrow material (for geobags)	cubic meters	93668.84
Porcupines	Number	26496

19. **Earthworks**: Approximated excavated earthwork quantity from bank trimming is given in Table 2-5. The excavated soils from the existing riverbanks will be reused as filling material toward countryside as per requirement.

Table 2-5: Approximated Earthworks Quantity

Earthworks	Volume	Remarks
Excavations for bank trimming	58776.79 cum	Will be reused in backfilling in countryside

20. **Source of Construction Materials:** Construction materials such as sand will be identified by respective contractors, and permissions will be obtained after due diligence by the Mines and Minerals Department. Generally, the river sand is available locally, mining sites need to be identified in consultation with WRD, the Contractors will obtain necessary approvals from the Department of Mines and Minerals / forest department. These borrow activities should follow the WBG EHS Guidelines on Construction Materials Extraction.

21. **Use of Water and Energy**: The water will be required mainly for drinking purposes and will be sourced from existing hand pumps or packaged water supply.

Gasoline and electrical energy will be used for the camps to prevent pressure on natural forests in the project area. The contractor will avoid using fuel wood for construction purposes and for cooking purposes in labour camps. The energy required for the construction works is mainly diesel and petrol. Diesel will be used for the transportation of materials. Vehicles will use diesel or petrol supplied by the contractor from outside the project area. Subproject Implementation Schedule

22. Construction works will be completed in four months time considering the working season.

Table 2-6: Subproject Implementation Schedule

Item	2024			
	M -1	M -2	M- 3	M – 4
Supply of Materials				
Apron Works				
Bank Trimming works				
Revetment works				

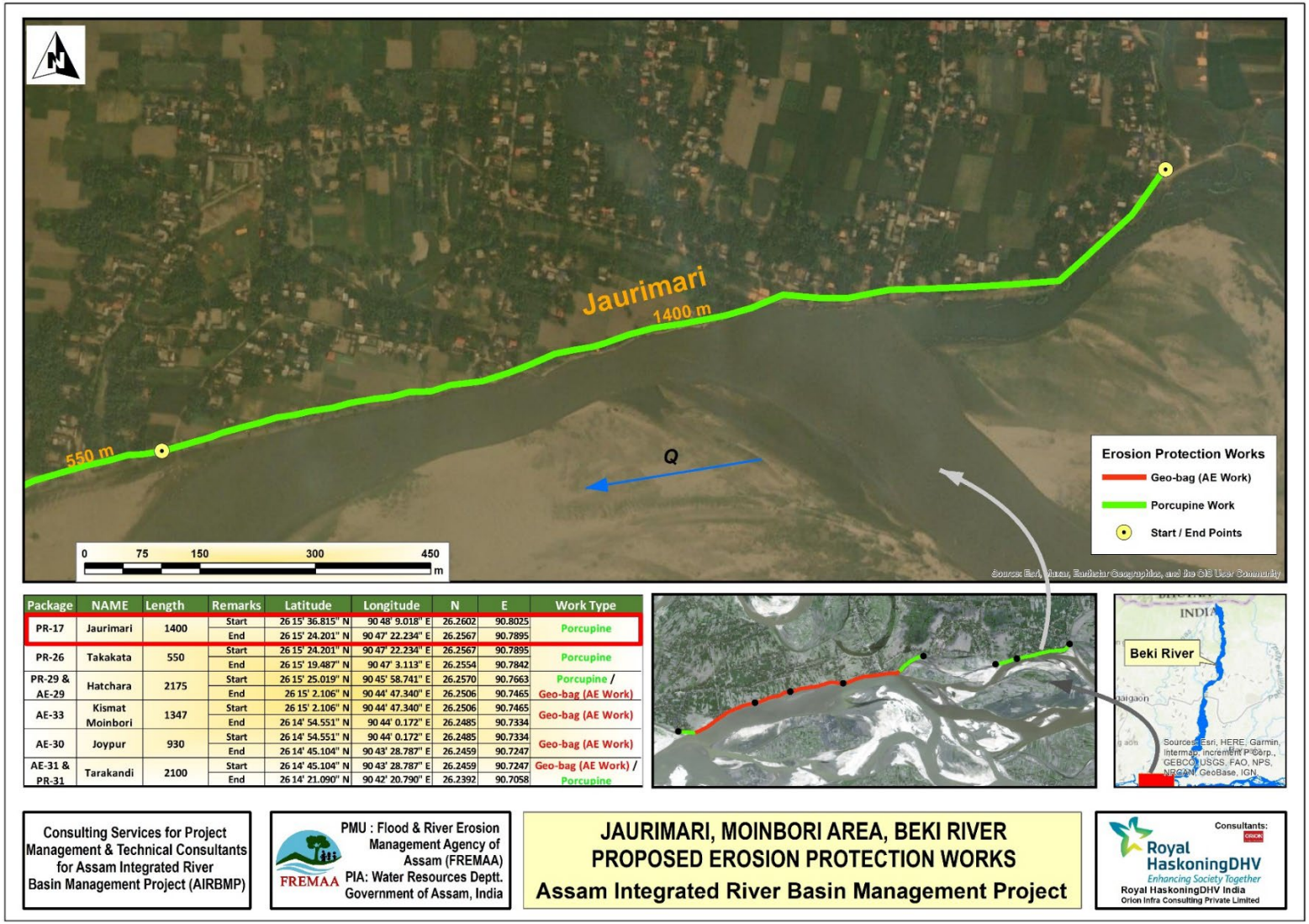
2.8 Analysis of Alternatives

Without Project Scenario.

23. The maps illustrating the proposed locations for riverbank protection work can be found in Figure 2-6 Without-project or no-project scenario continues to erode the riverbanks, affecting the floodplain communities and their livelihoods. Some critical infrastructure, such as roads and public

utilities, are also subject to this erosion requiring relocation or reconstruction of these facilities. The no project scenario will definitely result in significant erosion issues, posing both environmental and social challenges. This urgency is intensified by the rapid pace of erosion along the riverbanks, directly impacting floodplain communities. The critical need for immediate action is evident in the escalating threat to both the environment and the well-being of the affected communities.

The anti-erosion works proposed under this subproject will result in savings of about 116 hectares of land annually, which otherwise will likely be caused by riverbank erosion if no protective measures are implemented undertaken.



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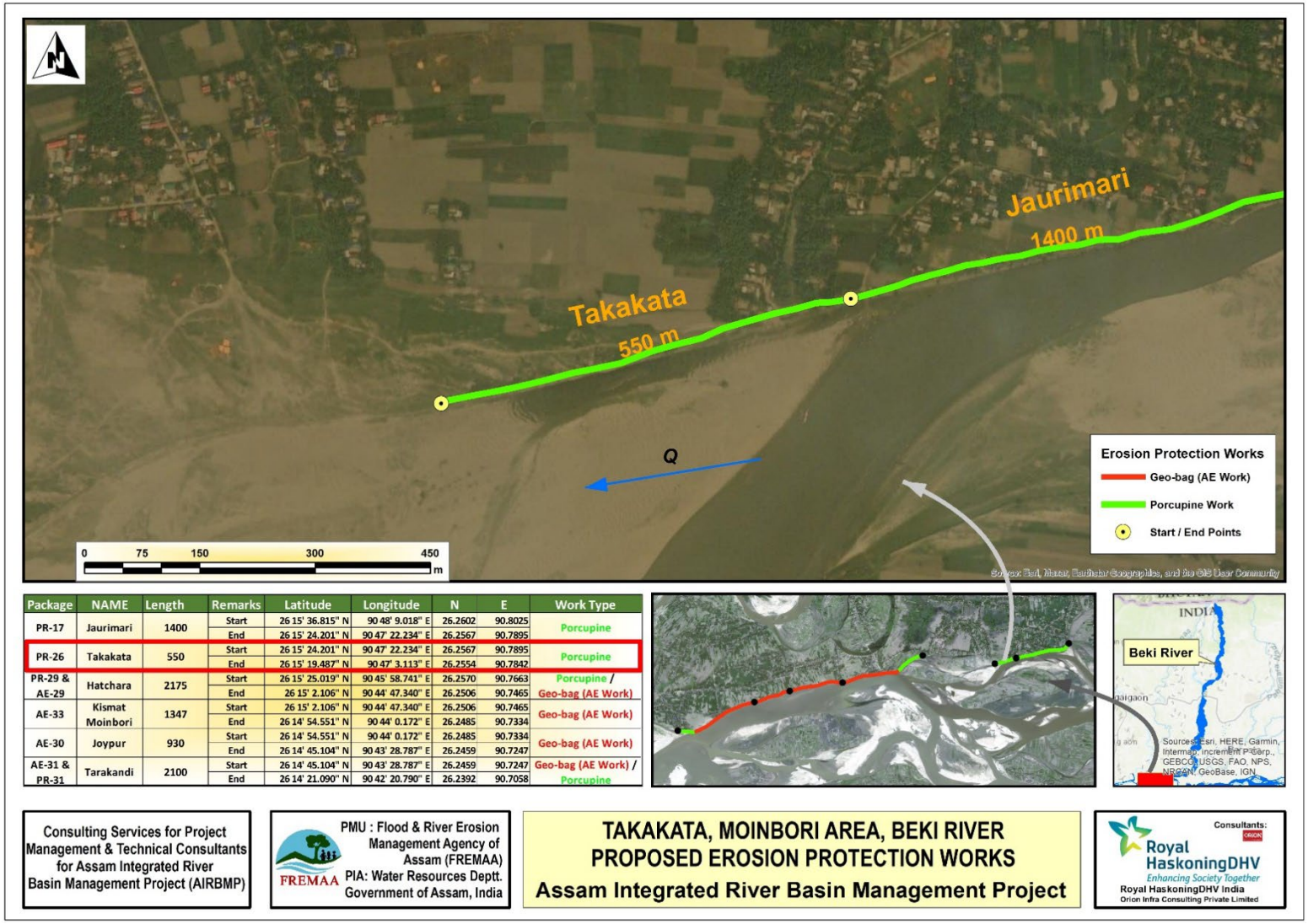
PMU : Flood & River Erosion Management Agency of Assam (FREMAA)
PIA: Water Resources Deptt. Government of Assam, India

JAURIMARI, MOINBORI AREA, BEKI RIVER
PROPOSED EROSION PROTECTION WORKS
Assam Integrated River Basin Management Project

Consultants:
Royal HaskoningDHV
Enhancing Society Together
Royal HaskoningDHV India
Orion Infra Consulting Private Limited



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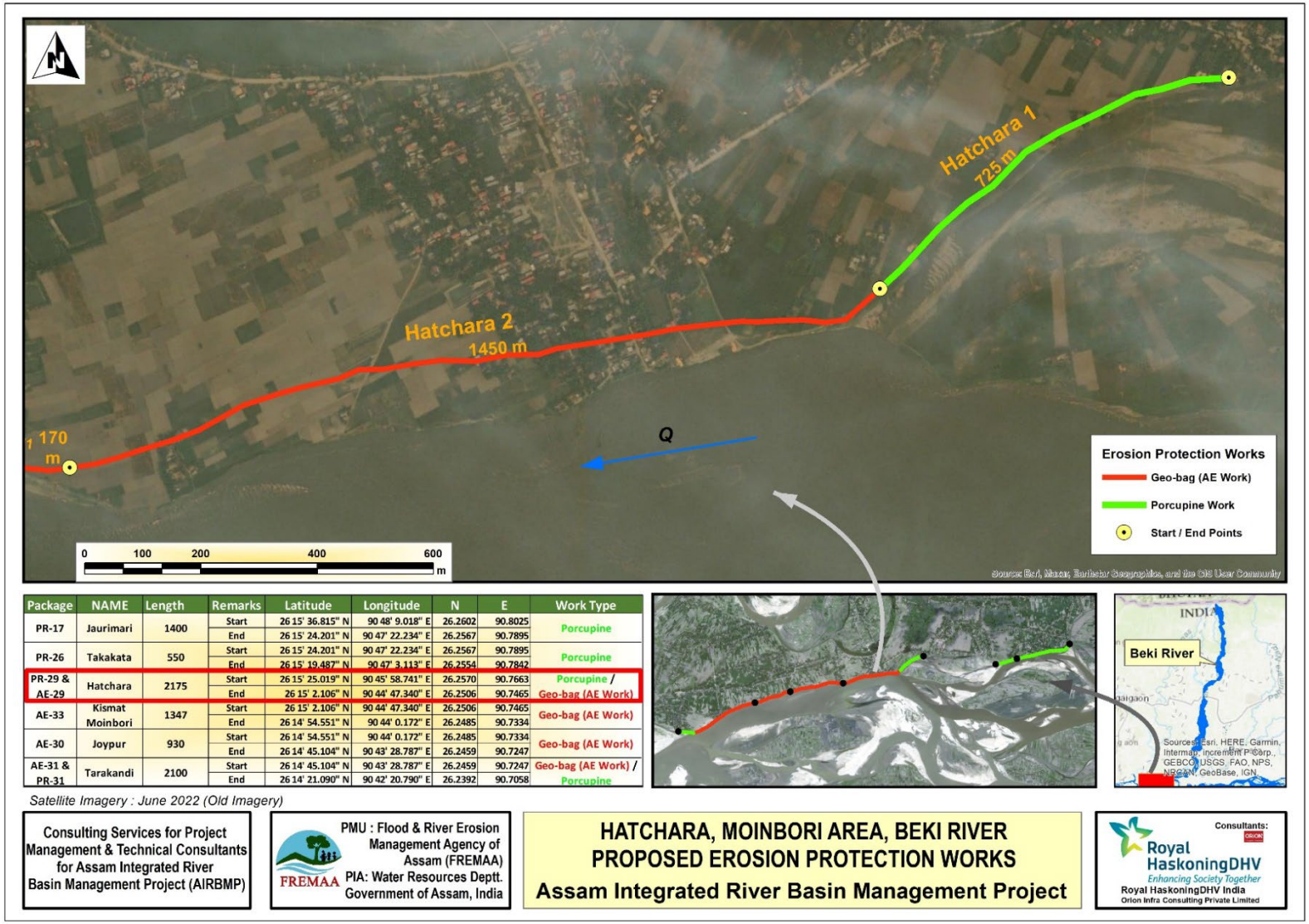

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Satellite Imagery : June 2022 (Old Imagery)

Consulting Services for Project Management & Technical Consultants for Assam Integrated River Basin Management Project (AIRBMP)

FREMAA
PMU : Flood & River Erosion Management Agency of Assam (FREMAA)
PIA: Water Resources Deptt. Government of Assam, India

HATCHARA, MOINBORI AREA, BEKI RIVER
PROPOSED EROSION PROTECTION WORKS
Assam Integrated River Basin Management Project

Consultants:
Royal HaskoningDHV
Enhancing Society Together
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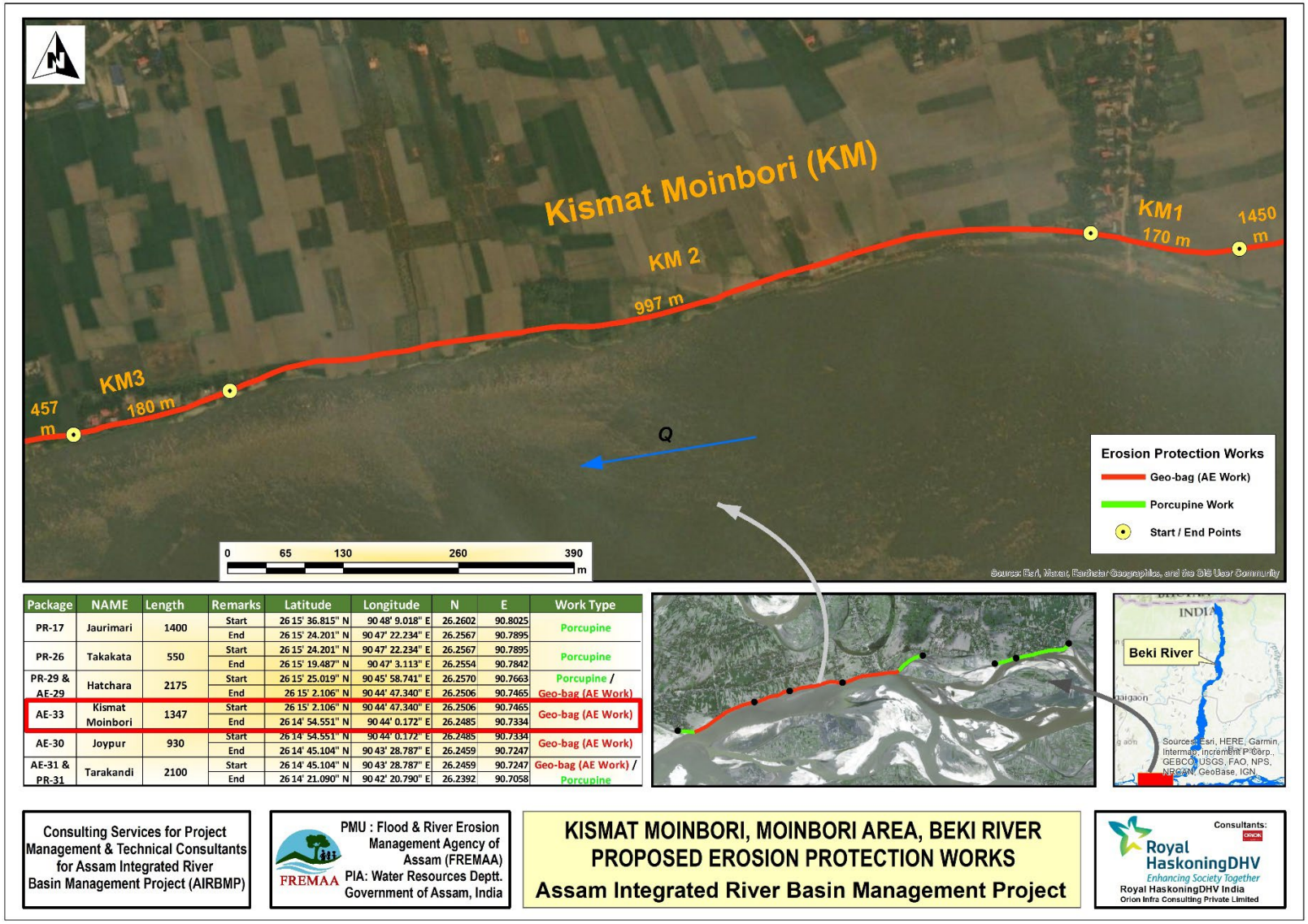

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PIA: Water Resources Deptt. Government of Assam, India

KISMAT MOINBORI, MOINBORI AREA, BEKI RIVER
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Assam Integrated River Basin Management Project

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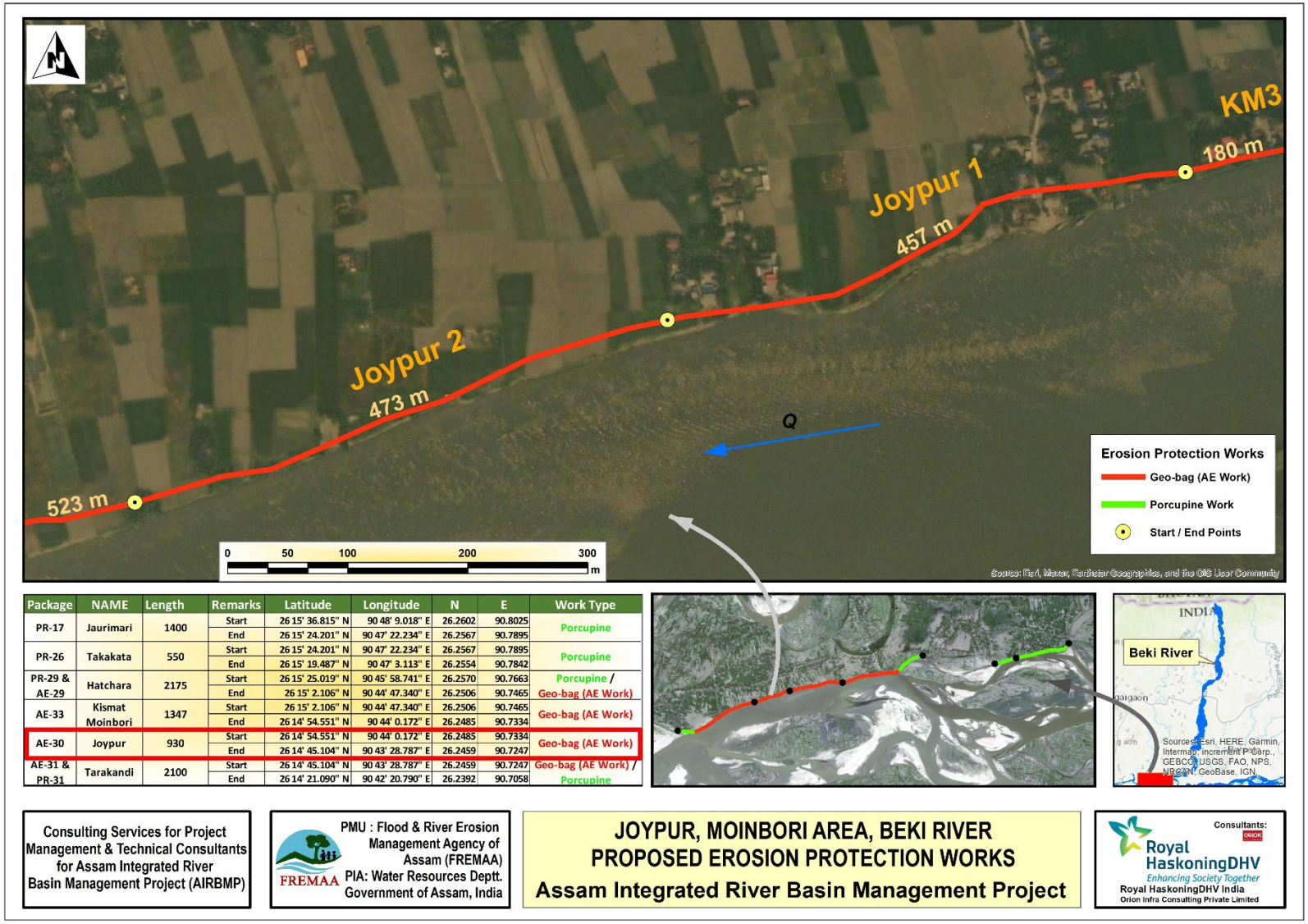

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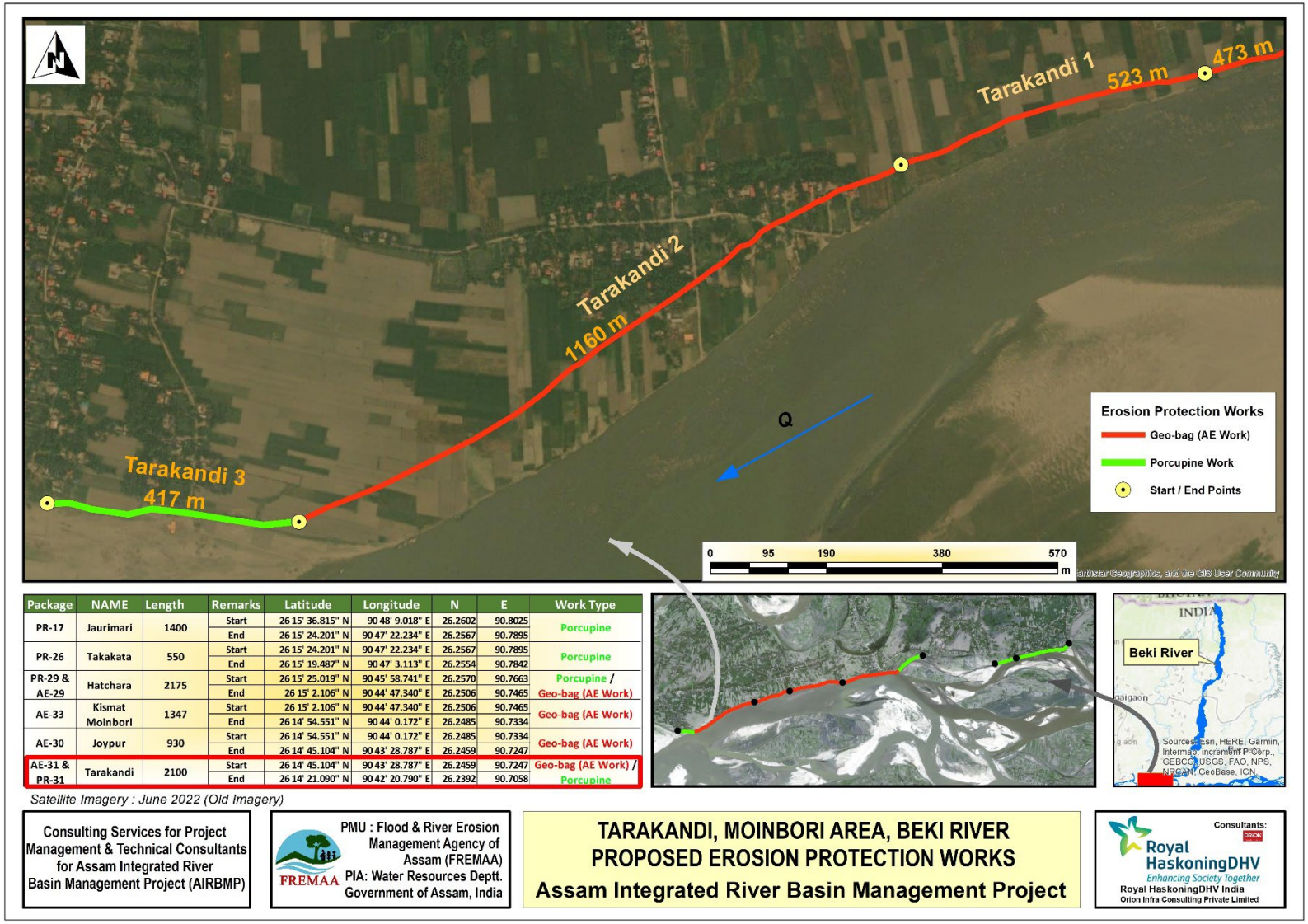

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Figure 2-6 Map showing the proposed interventions at Moinbori areas

3 Legal and Institutional Framework

24. This section explains the government legal and regularity requirements under different acts for environmental and social aspects. It also identifies the requirement of permits/licenses in the sub-project under different rules /regulations at different stages of the project period. Further, an outline of the World Bank Environmental and Social Management Framework (ESF) has been presented.

3.1 Some Important Legal Provisions Related to Project Activities

25. The legislations given below explained some important legal and policy provisions of Government of India (GoI), Government of Assam (GoA) and international conventions relevant to the subproject activities. While some of the key acts are mentioned below, the entire legal and regulatory framework is given in the ESMF.

Table 3-1:Important Legal Provisions Related to Project Activities

Sr. No.	Relevant Acts and Policies of GoI and GoA	Mandate of the Act/ Policy	Applicability	Responsibilities
ENVIRONENTAL REGULATIONS				
1	Environment Protection Act/ Rules 1986 and amendments till date	The Environment Protection Act, 1986 (the "Environment Act") provides for the protection and improvement of environment. The term "environment" is understood in a very wide term under s 2(a) of the Environment Act. It includes water, air, and land as well as the interrelationship which exists between water, air and land, and human beings, other living creatures, plants, microorganisms, and property. Under the Environment Act, the Central Government issues notifications under the Environment Act for the protection of ecologically sensitive areas or issues guidelines for matters under the Environment Act	The various environmental quality standards notified under this act are applicable to the project. These include General standards for discharge of environmental pollutants. ■ Ambient air quality standards ■ Vehicular exhaust norms ■ Noise limits for vehicles Emission and noise limits for gensets	MoEF& CC
2	Air (Prevention and Control of Pollution) Act, 1981, 1987	To provide for the prevention, control, and abatement of air pollution, and for the establishment of Boards to carry out these purposes.	Yes. Air pollution from proposed activities during construction stage need to be monitored and kept within limits.	SPCB. Stack of DG set should be at appropriate height
3	Water Prevention and Control of Pollution) Act, 1974, 1988	To provide for the prevention and control of water pollution and the maintaining or restoring of wholesomeness of water.	Yes. Water pollution from proposed activities during construction stage need to be monitored and kept within prescribed limits.	SPCB. Arrangement of proposed drainage, septic tank with soak pit and treatment of wastewater from kitchen and

Sr. No.	Relevant Acts and Policies of GoI and GoA	Mandate of the Act/ Policy	Applicability	Responsibilities
				bathroom area of workers camp
4	Noise Pollution (Regulation and Control Act) 2000 and amendment till date	Workplace noise is covered under Indian factories Act, 1948 but this rule provides safety against noise in ambient condition with generation of noise by certain point and area source.	Yes. Noise emission from proposed activities during construction stage like operation of DG sets of applicable ratings. This needs to be monitored and kept within prescribed limits.	CPCB & SPCB
5	Hazardous & Other Waste (Management and Trans-boundary Movement) Rules, 2016	Protection to public against improper handling, storage, and disposal of hazardous waste. The rules prescribe the management requirement of hazardous wastes from its generation to final disposal.	Yes. Hazardous waste generation from proposed activities like generation of used oil/waste oil, used filter etc. From DG set. Needs to be monitored and kept within prescribed limits.	SPCB. Authorization for handling and disposal of hazardous wastes.
6	Manufacture Storage, & imports of Hazardous Chemicals (MSIHC) Rules, 1989 as amended till date	Usage and storage of hazardous substances	Not applicable	
7	The Batteries (Management and Handling) Rules 2001	To regulate the disposal and recycling of lead acid batteries	Not applicable	
8	Construction and Demolition Waste Management Rules, 2016	To manage the demolition and construction waste and prevent environmental degradation	Applicable. Very minimal quantity of C&D waste will be generated from proposed activities,	Local bodies of the area. Contractor needs to submit plan for reuse or safe disposal any

Sr. No.	Relevant Acts and Policies of GoI and GoA	Mandate of the Act/ Policy	Applicability	Responsibilities
			Which shall be reused	kind of waste generation
9	Solid Waste management Rules, 2016	To manage solid waste or semi-solid domestic waste, sanitary waste	Yes. Solid Waste will be generated from proposed activities due to influx of labour; this need to be monitored and safely disposed.	Local bodies of the area Contractor needs to submit plans for its safe disposal
10	Vehicle Act 1988 Central Motor Vehicle Rules 1989	To minimize the road accidents, penalizing the guilty, provision of compensation to victim and family and check vehicular air and noise pollution.	Yes. Transportation of manpower and material. All vehicles need to have fitness certificates and PUC,	Motor Vehicle Department (Licensing authority, registration authority & State Transport Authorities)
11	The Gas Cylinder Rules 2016	To regulate the storage of gas / possession of gas cylinder more than the exempted quantity.	Not applicable	
12	The Mines and Minerals (Development and Regulation) Act, 1957 Assam Minor Mineral Concession Rules 2013 Assam Mineral Regulation and Dealers Rules 2020	For development and regulation of mines and minerals in a sustainable manner. The rules regulate the mining of mineral and dealerships for mining and trading.	Yes The construction of works will require, sand, etc. Materials should only be procured from licensed quarries. PSC porcupine shall be procured from authorized vendors	Mines and Geology Department / Forest department
13	The Forest (Conservation) Act, 1980 and Amendments	To help conserve the country's forests. It strictly restricts and regulates the de-reservation of forests or use of forest land for non-forest purposes without the	Project site does not fall under any forest zone	

Sr. No.	Relevant Acts and Policies of GoI and GoA	Mandate of the Act/ Policy	Applicability	Responsibilities
	and The Forest (conservation) Rules 1981 and Amendments	prior approval of the Government. To this end the Act lays down the pre-requisites for the diversion of forest land for non-forest purposes		
14	Biological Diversity Act, 2002	The Act provides a comprehensive legal framework for conservation and sustainable use of bio-resources reflects a strict regime for access, control, and benefit sharing. It restricts access and use of biological resources by outsiders and creates decentralized institutional structures (State Biodiversity Boards – SBB and GP level Biodiversity Management Committees) for conservation of biological diversity.	Not applicable As none of project falls under forest area, national park, or wildlife sanctuary. Biodiversity / Wildlife conservation measure given in ESMP	Assam State Biodiversity Board
15	Assam Forest Policy, 2004	Conservation of forest and controlled felling of trees	None of the project location fall within or near to forest area.	State Forest Department
16	Assam Biodiversity Rules, 2010	Conservation of biological diversity, sustainable use of its components and fair and equitable sharing of benefits arising out of the use of biological resources	Not applicable As none of project falls under forest area, national park, or wildlife sanctuary. Biodiversity / Wildlife conservation measure given in ESMP	Assam State Biodiversity Board
17	Wildlife Protection (Assam Amendment) Act 2009	Protection of wildlife in the state of Assam	None of project sites falls within National Park, Wildlife Sanctuary, Protected & reserve Forest, Animal Corridor etc.	State Forest Department

Sr. No.	Relevant Acts and Policies of GoI and GoA	Mandate of the Act/ Policy	Applicability	Responsibilities
			Wildlife protection measure given in ESMP	
18	Eco-sensitive Zone Notifications 2015	The activities in areas around Wildlife Sanctuaries and National Parks are regulated from the perspective of conservation of wildlife	Project does not fall under any national park, nearest location to Manas national park is approx. 45 km	MoEF&CC
19	State Compensatory Afforestation Fund Management and Planning Authority Forest (Conservation) Amendment Rules, 2014	It seeks to establish the National Compensatory Afforestation Fund under the Public Account of India, and a State Compensatory Afforestation Fund under the Public Account of each state. The collected funds will be utilized for afforestation, regeneration of forest ecosystem, wildlife protection and infrastructure development.	Not applicable, as project does not fall in or near to any forest area.	State Forest Department
20	The Assam Compensatory Afforestation Fund Rules, 1994	To constitute a Fund for the purpose of Compensatory Afforestation to be raised against the Forest Area diverted for non-forest use under the provisions of Section 4(1) of the Forest (Conservation) Act, 1980	Not applicable None of project location falls under forest areas	State Forest Department
21	Assam (Control of Felling & Removal of trees from Non-Forest Land) Rules 2002	Conservation of forest and controlled felling of trees	Applicability will depend on specific to stretches (Sub-Projects) and activities proposed.	State Forest Department
22	Assam Rhinoceros Preservation Act 1954	Conservation of Rhinoceros	Not applicable None of project locations falls near the forest area / animal corridor/ wildlife sanctuary	State Forest Department

Sr. No.	Relevant Acts and Policies of GoI and GoA	Mandate of the Act/ Policy	Applicability	Responsibilities
23	Disaster Management Act, 2005	The purpose is to have an effective management of disasters and for matters connected therewith or incidental thereto	The subproject areas fall under the seismic (earthquake prone) zone V and hence any construction activities/ interventions will be under purview of this act	Assam State Disaster Management Authority
24	Assam State Disaster Management Policy 2010	The policy is to provide measures' to be adopted for prevention and mitigation of disaster; mitigation measure to be integrated with development plans and projects; build capacity and preparedness measure; and specify roles and responsibilities to each dept. in relation to adopted measure	Yes. During implementation, setting of labour camps and capacity building of contractor staff	PMU/PIU
25	Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996	To regulate the employment and conditions of service of buildings and other construction workers and to provide for their safety, health, and welfare measures and for other matters connected therewith or incidental thereto.	Yes. Involvement of workforce/labour	Chief Labour Commissioner
SOCIAL REGULATIONS				
26	The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013	The act provides for a transparent process and fair compensation in land acquisition for public purpose and provides for rehabilitation and resettlement of landowners and those affected by land acquisition. It comprises four schedules that provide the minimum applicable norms for compensation based on market value, multiplier and solatium; resettlement and rehabilitation (R&R) entitlements to landowners and livelihood losers; and facilities at resettlement sites for displaced persons, besides providing flexibility to	Yes. Applicable to all sub-projects when private land is required to acquired involuntary basis.	Revenue Department/ District Administration Stage wise notification as per Act

Sr. No.	Relevant Acts and Policies of GoI and GoA	Mandate of the Act/ Policy	Applicability	Responsibilities
		states and implementing agencies to provide higher norms for compensation and R&R.		
27	Notification on Land Acquisition through Direct Purchase by the way of negotiated settlement for public purpose for all departments in the state of Assam, RLA.177/2021/3 dated 07/03/2022 and amendment notification no RLA.201013/37. dated 23rd August 2023 (copy enclosed in RAP) .	This GO is enacted by GoA, facilitates direct purchase of land by the way of negotiated settlement. The direct purchase price shall be25%higher on the compensation as per provisions of Section 26 to 30 Schedule I of RFCTLARR Act 2013 with multiplier factor. The R&R benefits will be deemed included in it. Under the amendment notification, following are the broader changes has been indicated, which will be applicable into this project- 1. As per step no. 6 general notices Shall be published and waiting period shall be given 15 days for receiving any objections from the land owners. 2. Registration fees under the provision of 78(A) of Indian Registration Act 1908 in respect of instrument executed by or on behalf of or in favour of Government on land acquisition through direct purchase by way of negotiated settlement for all Departments shall be exempted. 3. Value of structure/building to be assessed with 100% solatium in case of Government structure/building standing on the Government land and payment shall be made in favour of the Department whose structure belongs to.	Sub project will require acquisition of private land through direct purchase	District Level Land Purchase Committee (DLLPC) Stage wise notification as per G.0

Sr. No.	Relevant Acts and Policies of GoI and GoA	Mandate of the Act/ Policy	Applicability	Responsibilities
		4. It has specified the Factor by which the market value is to be multiplied in the distance from the nearest urban area.		
28	Panchayats (Extension to the Scheduled Areas) Act, 1996	The Gram Sabha or the Panchayats at the appropriate level shall be consulted before making the acquisition of land in the Scheduled Areas for development projects and before re-settling or rehabilitating persons affected by such projects in the Scheduled Areas.	Not applicable	
	Labour Laws Applicable to Establishments Engaged in Building and Other Construction Work			
29	Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996	It regulates the employment and conditions of service of building and other construction workers and provides for their safety, health, and welfare.	Yes Applicable.	Chief labour Commissioner
30	Workmen Compensation Act, 1923	It provides for payment of compensation by employers to their employees for injury by accident i.e., personal injury or occupational disease.	Construction workers will be involved in the sub-projects	Commissioner for Workmen's Compensation
31	Inter-state Migrant Workers Act, 1979	It protects workers whose services are requisitioned outside their native states in India. A contractor who employs or who employed five or more Inter-State migrant workmen need to obtain registration under this act	Not applicable as workers engaged of either nearby villages or another district of Assam	Chief labour Commissioner
32	The Child Labour (Prohibition & Regulation) Amendment Act, 2016	It prohibits employment of children in specified hazardous occupations and processes and regulates the working conditions in others.	There should not be any child labour (less than 14 years) in any project activity and adolescents (above 14	Chief labour Commissioner

Sr. No.	Relevant Acts and Policies of GoI and GoA	Mandate of the Act/ Policy	Applicability	Responsibilities
			and less than 18 years) in any hazardous activity.	
33	Sexual Harassment of Women at the Workplace (Prevention, Prohibition and Redressal) Act, 2013 (POSH Act)	It mandates every organization having more than ten employees to constitute an Internal Complaints Committee (ICC) in the prescribed manner to receive and address the complaints of any sort of sexual harassment from women in a time-bound and extremely confidential manner	Applicable to all implementing agencies	District Officer (District Magistrate or Additional District Magistrate)
	International Conventions			
34	Forced Labour Convention, 1930 (No. 29),	Prohibits all forms of forced or compulsory labour, which is defined as “all work or service which is exacted from any person under the menace of any penalty and for which the said person has not offered himself voluntarily.” The convention also requires that the illegal extraction of forced or compulsory labour is punishable as a penal offence and that ratifying states ensure that the relevant penalties imposed by law are adequate and strictly enforced.	Applicable to all implementing agencies	Chief labour Commissioner
35	Abolition of Forced Labour Convention, 1957 (No. 105),	Prohibits forced or compulsory labour as a means of political coercion or education or as a punishment for holding or expressing political views or views ideologically opposed to the established political, social, or economic system; as a method of mobilizing and using labour for economic development; as a means of labour discipline; as a punishment for having participated in strikes; and as a means of racial, social, national, or religious discrimination	Applicable to all implementing agencies	Chief labour Commissioner

Sr. No.	Relevant Acts and Policies of GoI and GoA	Mandate of the Act/ Policy	Applicability	Responsibilities
36	Equal Remuneration Convention, 1951 (No. 100)	Lays out the principles for equal remuneration for work of equal value and addresses gender discrimination	Applicable to all implementing agencies	Chief labour Commissioner
37	Discrimination (Employment and Occupation) Convention, 1958 (No. 111),	Prohibits all discrimination and exclusion on any basis including of race or colour, sex, religion, political opinion, national or social origin in employment and repeal legislation that is not based on equal opportunities	Applicable to all implementing agencies	Chief labour Commissioner
38	Minimum Age Convention, 1973 (No. 138)	To ensure the effective abolition of child labour and to rise progressively the minimum age for admission to employment or work. India has ratified this convention with minimum age at 14 years	Applicable to all implementing agencies	Chief labour Commissioner
39	Convention concerning the Prohibition and Immediate Action for the Elimination of the Worst Forms of Child Labour, 1999 (No. 182).	Prohibition and elimination of the worst forms of child labour, including slavery, forced labour and trafficking in human beings. It prohibits the use of children in armed conflicts, prostitution and pornography, illegal activities such as drug trafficking and dangerous work.	Applicable to all implementing agencies	Chief labour Commissioner

3.1.1 Key Statutory Clearances for Construction

26. Certain permissions, clearances and authorizations need to be obtained from competent authorities during the design and construction phase of sub-projects. This will depend mainly on the area, type, size, and scope of the sub-project in question. The key statutory permits that may be required are summarized below:

Table 3-2: List of Statutory Clearances and Requirements

Sr. No.	Clearance/ Authorization	Relevant Act	Competent Authority	Responsibility	When required
1	Permission for mining minerals (, sand, etc.) from riverbeds	Environment Protection Act, 1986	Mines and Geology Department/ forest department	Contractor	Immediately after award of contract
2	Pollution Under Control certificate for vehicles	Central Motor Vehicle Act 1988	Transport Department	Contractor/ PIU	During the project implementation for all vehicles engaged at sites
3	Labor license, BOCW registration, All risk Policy and WC compensation policy	The Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act 1996	Labour Department	Contractor	Immediately after award of contract, and to be renewed regularly till completion of works
4	Fire Safety Clearance	National Building Code State Fire Prevention and Fire Safety Act/Rules Public Safety Standards of India	State Fire Department	Contractor	Immediately after award of contract
5	Electrical Safety	Indian Electricity Act, 1910 re-enacted in 2003. Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations, 2010	Chief Electrical Inspector	Contractor	Immediately after award of contract

27. The construction activities under the project are along rivers and in rural areas. These are considerably medium type of works to be built by local/ national contractors. As per the existing practices in Barpeta, mostly the labour will be local from nearby communities, and some will be from other districts within Assam. Groundwater shall not be used in construction activities; only river

water will be used for these works; where groundwater is used permissions required for extraction of groundwater will be obtained.

3.2 Applicability of WB ESS

28. The table below compares each of The World Bank's Environmental and Social Standards with the equivalent national and state environment and social acts/ policies/ regulations and the gaps, including the remedial measures to fill the gaps.

Table 3-3:The World Bank's Environmental and Social Standards

ESS	Equivalent National and State Environment/ Social Policy/ Regulation	Policy Gaps, Remedies and Redressal
ESS 1: Assessment and Management of Environmental and Social Risks and Impacts	Environment Protection Act/ Rules 1986 and amendments till date EIA Notification 14th Sep 2006 and amendments till date. The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013	As per the MoEF&CC EIA Notification 2006, proposed works does not require any EIA or approval from MoEF&CC or ASPCB. Borrowing of sand for geo bag filling will require permissions Miner & geology department or forest department. The ESS1 provisions are followed for all project activities for conducting ESIA and preparing ESMP
ESS 2: Labour and Working Conditions	Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 Workmen Compensation Act, 1923 Inter-state Migrant Workers Act, 1979 The Child Labour (Prohibition & Regulation) Amendment Act, 2016 Building and Other Construction Workers Welfare Cess Act, 1996 Sexual Harassment of Women at the Workplace (Prevention, Prohibition and Redressal) Act, 2013 (POSH Act) Contract Labour (Regulation & Abolition) Act 1970 Payment of Wages Act, 1936 The minimum wages rules Assam 1952 Payment of Gratuity Act, 1972 The payment of gratuity rules Assam 1972	The national and state legal provisions cover almost all requirements in ESS2 and the requirements of a functional GRM for different types of workers. For this project, a Labour Management Procedures has already been prepared and disclosed to regulate working conditions and management of labour relations including worker specific GRM, terms and conditions of employment, code of conduct, non-discrimination, equal opportunities, protection of labour force, prohibition of child/force labour and provision of OHS requirements. The main gap that LMP will cover is the OHS requirements of direct and contracted workers. The other gaps that the LMP fills is provision of Code of Conduct for

ESS	Equivalent National and State Environment/ Social Policy/ Regulation	Policy Gaps, Remedies and Redressal
	Employees Provident Fund and Miscellaneous Provision Act, 1952 Maternity Benefit Act, 1951 Assam Maternity benefit Rules 1965 Payment of Bonus Act, 1965 The Payment of Bonus Rules Assam 1975 The Bonded Labour (Abolition) Act 1976 Bonded Labour System (Abolition) Rules 1976 The Trade Union Act, 1926 The new labour codes of India; 1) Code on Social Security, 2020, 2) Code on Wages, 2019, 3) Industrial Relation Code, 2020 and 4) Occupational Safety, Health, and Working Conditions Code, 2020.	workers, GBV prevention measures, GRM for workers, etc. The ESS2 provisions are followed for all project activities.
ESS 3: Resource Efficiency and Pollution Prevention and Management	The Mines and Minerals (Development and Regulation) Act, 1957 Assam Minor Mineral Concession Rules 2013 Assam Mineral Regulation and Dealers Rules 2020 Air (Prevention and Control of Pollution) Act, 1981, 1987 Water Prevention and Control of Pollution) Act, 1974, 1988 Noise Pollution (Regulation and Control Act) 2000 and amendment till date Hazardous & Other Waste (Management and Trans-boundary Movement) Rules, 2016 Manufacture, Storage & imports of Hazardous Chemicals (MSIHC) Rules, 1989 as amended till date. The Batteries (Management and Handling) Rules 2001 Construction and Demolition Waste Management Rules, 2016 Vehicle Act 1988 Central Motor Vehicle Rules 1989 Energy Conservation Act, 2001 Roof-top Rainwater Harvesting, 1999	The majority of ESS3 requirements are directly addressed by existing regulations and indirectly for resource efficiency and climate change aspects including pollution prevention and management. The ESS3 provisions are integrated into the ESMPs and are followed for all project activities.

ESS	Equivalent National and State Environment/ Social Policy/ Regulation	Policy Gaps, Remedies and Redressal
ESS 4: Community Health and Safety	The Gas Cylinder Rules 2016 Hazardous & Other Waste (Management and Trans-boundary Movement) Rules, 2016 Disaster Management Act, 2005 Assam State Disaster Management Policy 2010 Solid Waste management Rules, 2016 Plastic waste management Rules, 2016 E-Waste Management Rules, 2016 Rights of Persons with Disabilities Act, 2016 Air (Prevention and Control of Pollution) Act, 1981, 1987 Water Prevention and Control of Pollution) Act, 1974, 1988 Noise Pollution (Regulation and Control Act) 2000 and amendment till date Manufacture, Storage & imports of Hazardous Chemicals (MSIHC) Rules, 1989 as amended till date. The Batteries (Management and Handling) Rules 2001 Construction and Demolition Waste Management Rules, 2016 Vehicle Act 1988 Central Motor Vehicle Rules 1989 Bureau of Indian Standards (BIS) National Building Codes	These existing laws and rules are to protect community health and safety. Hence, these laws and rules fulfill the community health and safety requirements. In addition, an ESMP is prepared to be implemented by the contractors, keeping community health and safety in mind. This ESMP deals with community health and safety which includes OHS plan, labour Influx management Plan, workers camp management plan, traffic, and road safety management plan, etc. The ESS4 provisions are integrated into the ESMPs and are followed for all project activities.
ESS 5: LA, Restriction on Land Use and Involuntary Resettlement	The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 Notification on Land Acquisition through direct purchase by the way of negotiated settlement for public purpose of departments in the state of Assam No. RLA.177/2021/3 dated 07/03/2022.	Gap exists specifically related to aspects such as identification of non-titleholders as PAPs and cut off dates for non-titleholders. The gaps are addressed with suitable provisions in RPF. The ESS5 provisions are integrated into the RPF and followed for preparations of RAPs.
ESS 6: Biodiversity Conservation	The Forest (Conservation) Act, 1980 and Amendments and The Forest (conservation) Rules 1981 and Amendments	Provisions from the acts meet the ESS requirements.

ESS	Equivalent National and State Environment/ Social Policy/ Regulation	Policy Gaps, Remedies and Redressal
and Sustainable Management of Living Natural Resources	National Forest Policy 1988 Biological Diversity Act, 2002 Assam Forest Policy, 2004 Assam Biodiversity Rules, 2010 Wildlife Protection (Assam Amendment) Act 2009 Eco-sensitive Zone Notifications 2015 State Compensatory Afforestation Fund Management and Planning Authority Forest (Conservation) Amendment Rules, 2014 The Assam Compensatory Afforestation Fund Rules, 1994 Assam (Control of Felling & Removal of trees from Non- Forest Land) Rules 2002 Assam Rhinoceros Preservation Act 1954 Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)	ESMP is prepared to address the wildlife presence and movement around the project areas. The ESS6 provisions are integrated into the ESMPs and are followed for all project activities.
ESS 7: Indigenous Peoples	Article 366 (25) of the Constitution of India Article 244(1) of Constitution of India - The Fifth Schedule under Article 244(1) of a subsequent Act of Constitution “Scheduled Areas” as such areas as the President may by order declare to be Scheduled Areas after consultation with Governor of that State. Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 Panchayats (Extension to the Scheduled Areas) Act, 1996	The legislation meets the requirements of ESS including FPIC. The ESS7 provisions are integrated into the IPPF No tribal populations are reported in project areas
ESS 8: Cultural Heritage	Ancient Monuments and Archaeological Sites and Remains Act, 1958 and 1959 The Treasure Trove Act 1878	The legislation meets the requirements of ESS. The Chance Finds procedures are available in the legislation. The chance find procedures are included in ESMP. Impacts on religious structures (not protected, but social and cultural value) will be mitigated or managed through provisions for restoration.

ESS	Equivalent National and State Environment/ Social Policy/ Regulation	Policy Gaps, Remedies and Redressal
		The ESS8 provisions are integrated into the ESMPs and are followed for all project activities.
ESS 9: Financial Intermediaries	Not Applicable	
ESS 10: Stakeholder Engagement and Information Disclosure	EIA Notification 14th Sep 2006 and amendments till date. The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 Panchayats (Extension to the Scheduled Areas) Act, 1996 Right to Information Act, 2005	The legislation partly covers this ESS with the act requiring providing information when asked for. Almost all the government agencies have GRM and Citizen Charters detailing the redressal and service services. ESS 10 has the provision for borrower to respond grievances of project-affected parties related to the environmental and social performance of the project in a timely manner as well as to proactively disclose publicly project related information. The ESS10 provisions are integrated into the SEP and are followed for all project activities.

4 Baseline Data: Environmental and Social

4.1 Land Use in the Project Influence Area Moinbori

29. Land use map for proposed sub projects prepared considering 10 KM buffer of Moinbori area and a summary of the land use is given below. The project area land use land cover map indicates total area approx.31416 ha within 10km buffer zone. About 23% of the land use in the project influence area is water bodies, 20.3% is temporary sandbar, 11.3% is buildup area and 10.85% is sand bar with settlements.

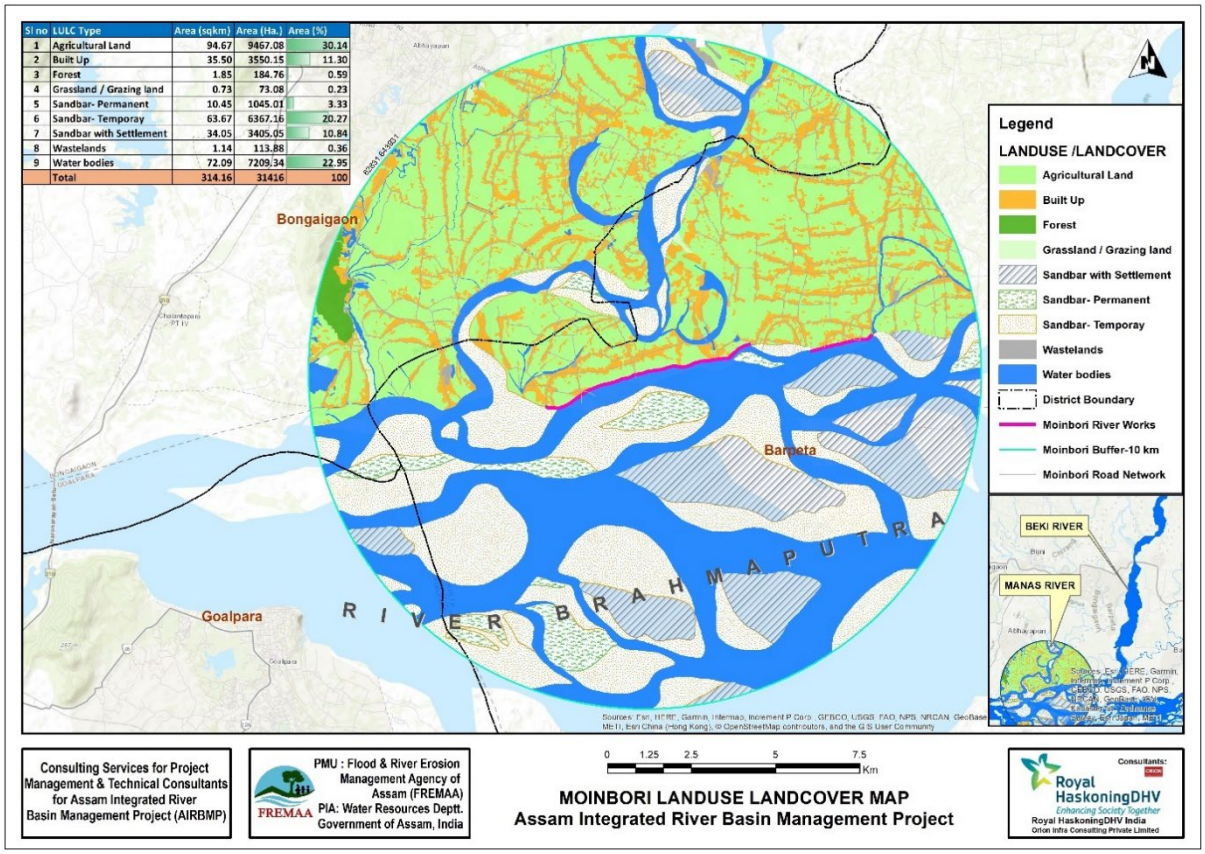


Figure 4-1: Land Use land cover maps of Monibori area

Table 4-1:Land use pattern - Beki

Sr.No.	AE/E Works Land Use Details	Area, Ha	Percentage, %
1	Agricultural land	9467.08	30.14
2	Built up	3550.15	11.30
3	Forest	184.76	0.59
4	Grassland / Grazing land	73.08	0.23
5	Sandbar – permanent	1045.01	3.33
6	Sandbar temporary	6367.16	20.27
7	Sandbar with settlement	1558.06	10.84
8	Wastelands	12.23	0.36
9	Water bodies	145.37	22.95
	Total	31416	100

4.2 Physical Environment

30. The Barpeta district covers an area of 2645 square K.Ms and is bounded by Baksa District in the North, Bajali District in the East, Kamrup and Goalpara District in the South and Bongaigaon District in the West. The latitude and longitude of Barpeta is 26.19' North & 91.00' East respectively. The general Topography of the Barpeta District varies from majorly low-lying plains to highland having

small-hillocks in the South-West-corner of the district, namely Baghbar, Fulora and Chatala overlooking the scenic and mighty Brahmaputra River.

31. The river Brahmaputra flows from east to west across the Southern part of the district. The tributaries of these river that flows through the district are Beki, Manah, Pohumara, Kaldia, Palla, Nakhanda, Marachaulkhowa and Bhelengi flowing from North to South. Rivers Pohumara and Kaldia joins near Barpeta town to form river Nakhanda whereas Palla and Beki join with Nakhanda to ultimately form Chaulkhowa river.

4.3 Basin Features

32. The river is a large tributary on the right bank of the Brahmaputra River. The river is about 379 kms long and originates approximately 7,453 m above mean sea level in the Himalayan mountains in Bhutan (. It flows through Barpeta and Baksa districts in Assam to its confluence with the Brahmaputra. Its watershed covers about 33,100 km2 out of which 3,892 km2 is in Assam. The river slope is very mild, mostly below 5 degrees, in the alluvial plains in Assam, and makes the river more vulnerable for lateral migration.

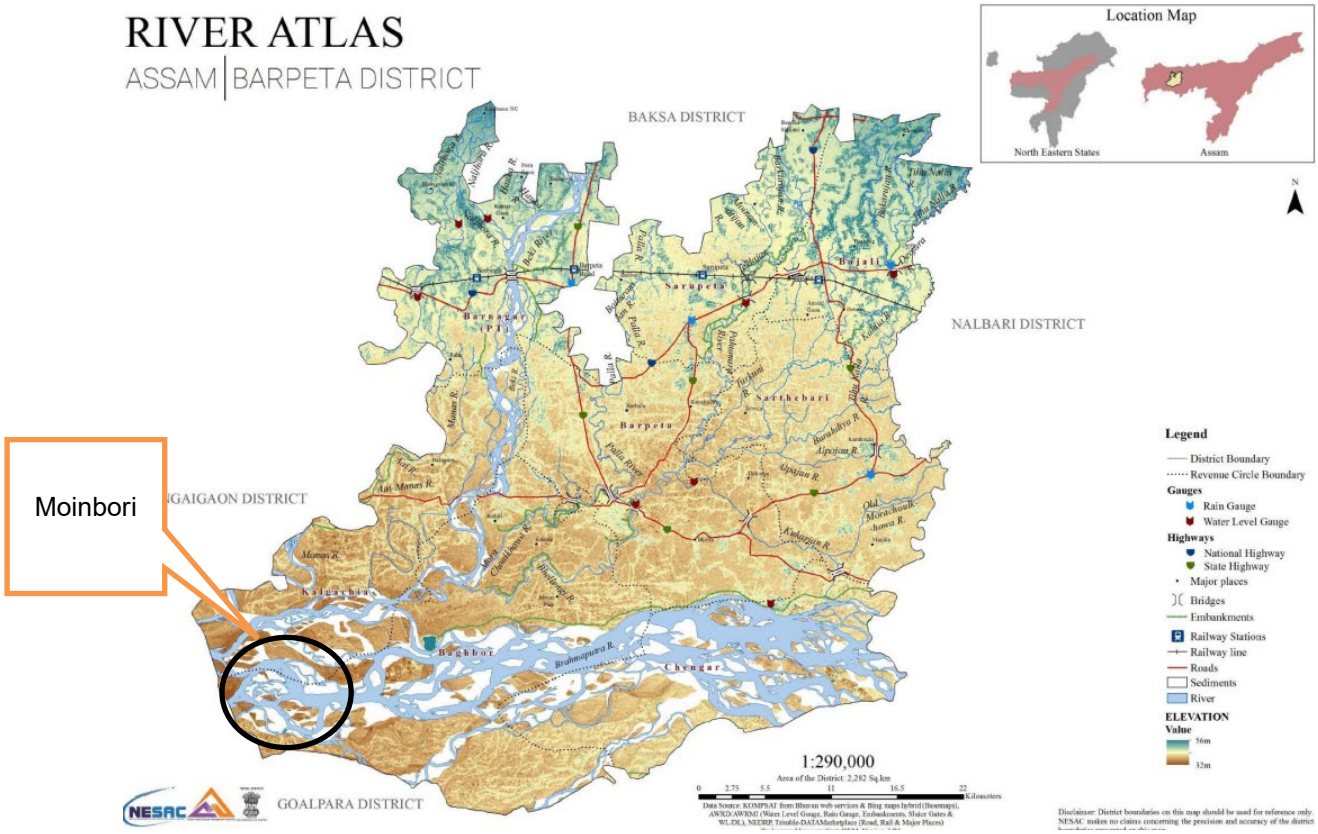


Figure 4-2: River district map (DEM in the background) with all important features for Barpeta

33. **Location of the subproject:** The proposed emergency works at Moinbori starts from Jaurimari (at L/B of Beki River) which is first location for river works and up to Tarakandi(at L/B of Beki River) near to the confluence of Beki River and Brahmaputra River covering all 12 reaches of Moinbori sub project under Barpeta District. It is situated in within location from Latitude/ Longitude 26°15'36.81"N 90°48'9.02"Eand Latitude / Longitude 26°15'24.34"N 90°47'22.24"E.

4.4 Physiography of Moinbori

34. Physio graphically almost the entire Barpeta district is occupied by an alluvial deposit with flat topography and there is a very gentle slope towards the Brahmaputra River, which makes the

southern boundary of the district. The district has soil cover of younger and older alluvial soil which has undergone diversified pedagogical changes.

4.5 Soil Type

35. The Barpeta district has soil cover of younger and older alluvial soil which has undergone diversified pedagogical changes. The soils are characterized by medium to high organic carbon and low to medium phosphorous and potash contents. Deep red colored soil is developed in forested and foothill areas in the extreme northern region and the texture of these soils ranges from clay to sandy loam. The alluvial soils are light yellow to light grey in color of recent age. The texture of the soil ranges from sandy loam to silty loan in nature.

4.6 Hydrogeology

36. Hydro-geologically, the entire area is occupied by alluvial sediments of quaternary age. Piedmont deposits comprising of coarse elastic sediments like boulder, pebble, gravel associated with sand and silt from the ground water bearing formation in the northern part of the district. Ground water occurs under unconfined condition in shallow aquifer and under semi-confined to confined condition in deeper aquifer. The aquifer is consisting of sand of various grades with little gravel in the southern part, with a very good yield prospect for both shallow and deep tube wells. The water level rests at shallow depth ranging from 2 to 4 m bgl during pre-monsoon period. The post-monsoon ground water level rests between 1 and 2 m bgl. The size of the aquifer materials gradually increases from south to north and the depth of water level is also high. The long-term water level trend study shows no significant change of water level in the last 10 years. The shallow tube wells tapping aquifers at the depth of 50 m bgl are capable of yielding 20–100 m^3/h at drawdown of less than 3 m. Medium to heavy duty tube wells constructed down to 100 to 150 m bgl tapping about 25–40 m granular zones yield more than 100m^3/h.

4.7 Geology

37. Assam has a diversified geological spectrum. It is located near the hairpin bend of the Himalayas. Hence the extreme geostatic pressures exerted on the landmass during the creation of the Himalayas have resulted in Assam having large areas of sedimentary deposits. This explains the huge amount of oil found in places like Digboi, Bongaigaon, etc. Discovered in 1889, all the major petroleum gas reserves are in Upper parts. A recent USGS estimate shows 399 million barrels (63,400,000 Cu.m) of oil, 1,178 billion Cu. ft. (3.34×1010 Cu.m) of gas and 67 million barrels (10,700,000 Cu.m) of natural gas liquids.

4.8 Seismicity

38. There are 4 major seismic zones (zones II, III, IV and V) in India, based on the seismo tectonic parameters, history of seismicity and certain geophysical parameters. The project area is located in Zone V as shown in the Bureau of Indian Standards (BIS) 2000 seismic zone map for India is given in Fig 21. Zone V is defined as region having probability of occurrence of earthquakes of higher intensity. The region has experienced a large number of earthquakes of tectonic origin in history. The risk probabilities of earthquake are less over the entire Brahmaputra valley.

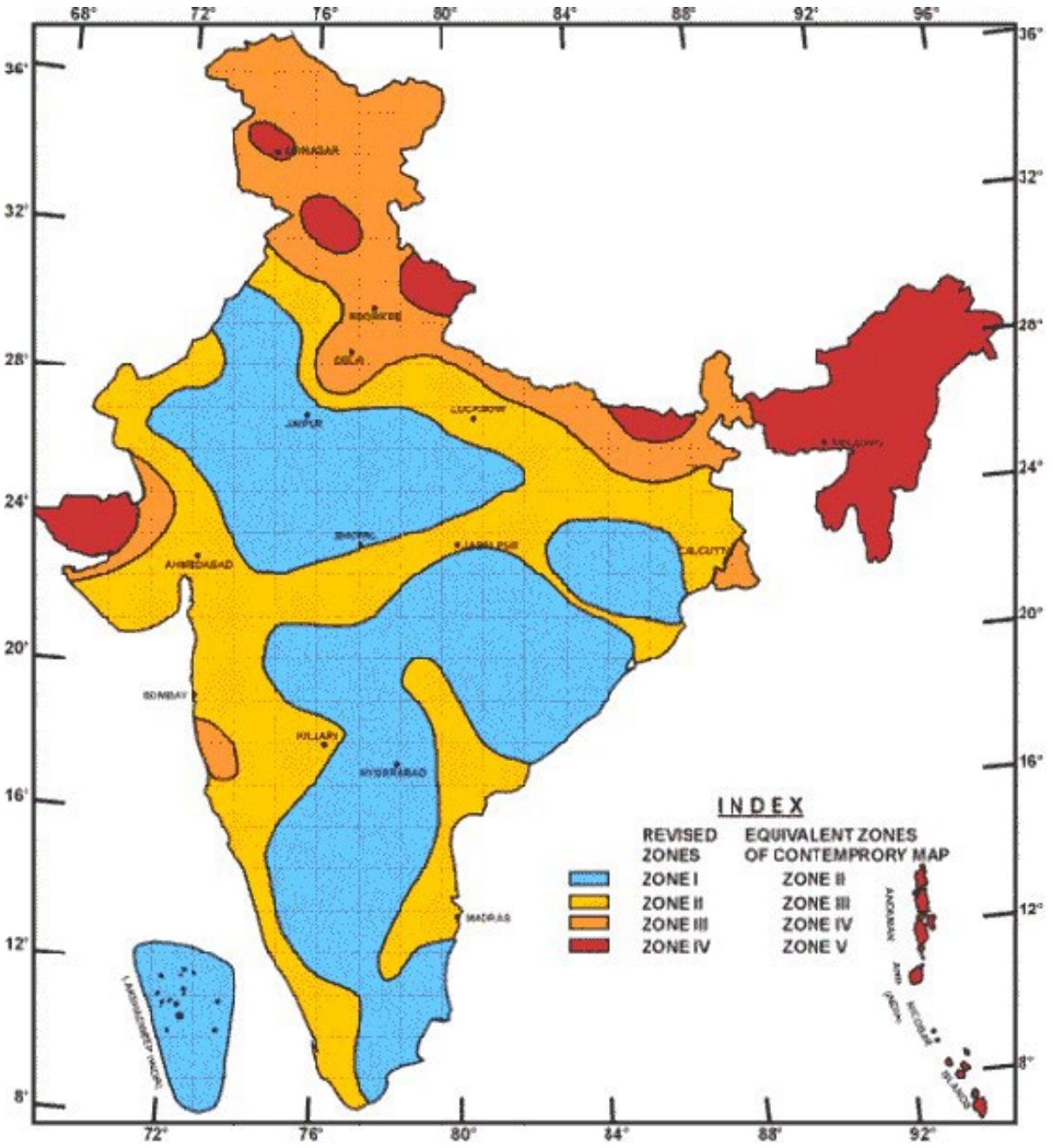


Figure 4-3: Map showing seismic tectonic zone.

4.9 Meteorology

4.9.1 Temperature:

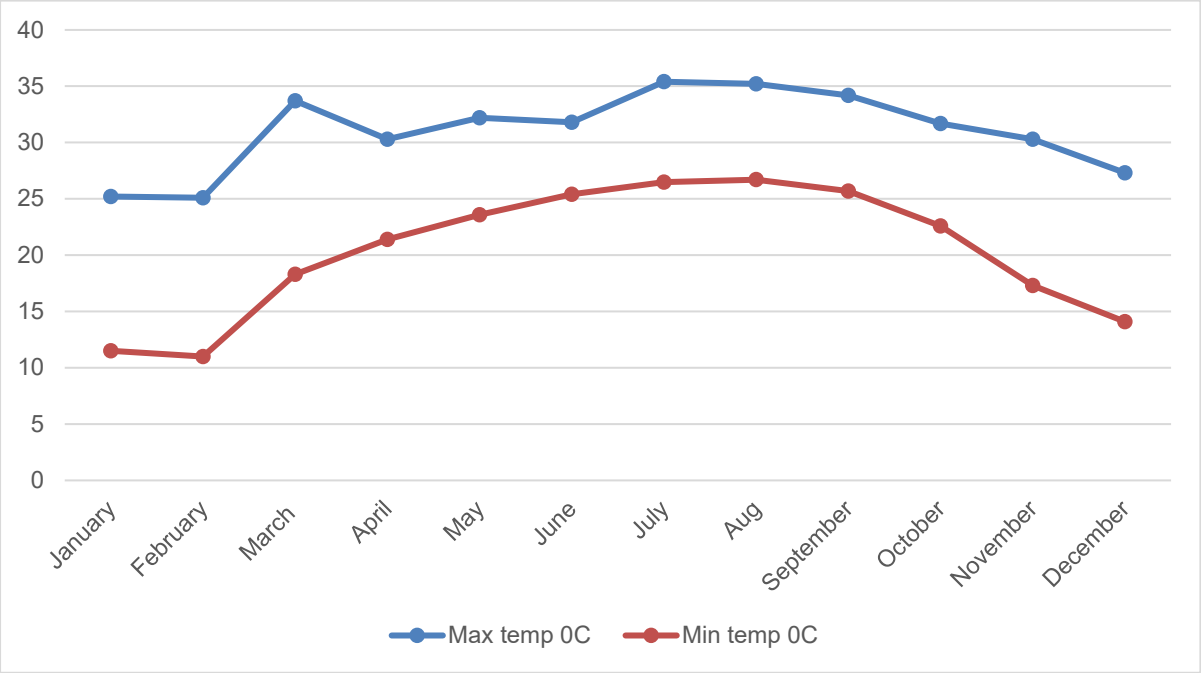
39. To study the meteorological parameters of the study area, available IMD data was used which are reflected in Table 4-2. The project location witnesses maximum temperature from the month of April till October. The maximum temperature has been recorded as high as 34.7^{0}Cin the month of September. The minimum temperature witnessed in the months of January, February, November, and December. The minimum temperature recorded as 11.1^{0}C in the month of January and December.

Table 4-2: Max and Min Temperature recorded in 2022 at Guwahati Airport IMD Station

Month	Max temp 0C	Min temp 0C

January	25.2	11.5
February	25.1	11
March	33.7	18.3
April	30.3	21.4
May	32.2	23.6
June	31.8	25.4
July	35.4	26.5
Aug	35.2	26.7
September	34.2	25.7
October	31.7	22.6
November	30.3	17.3
December	27.3	14.1

Source: IMD, Guwahati Airport



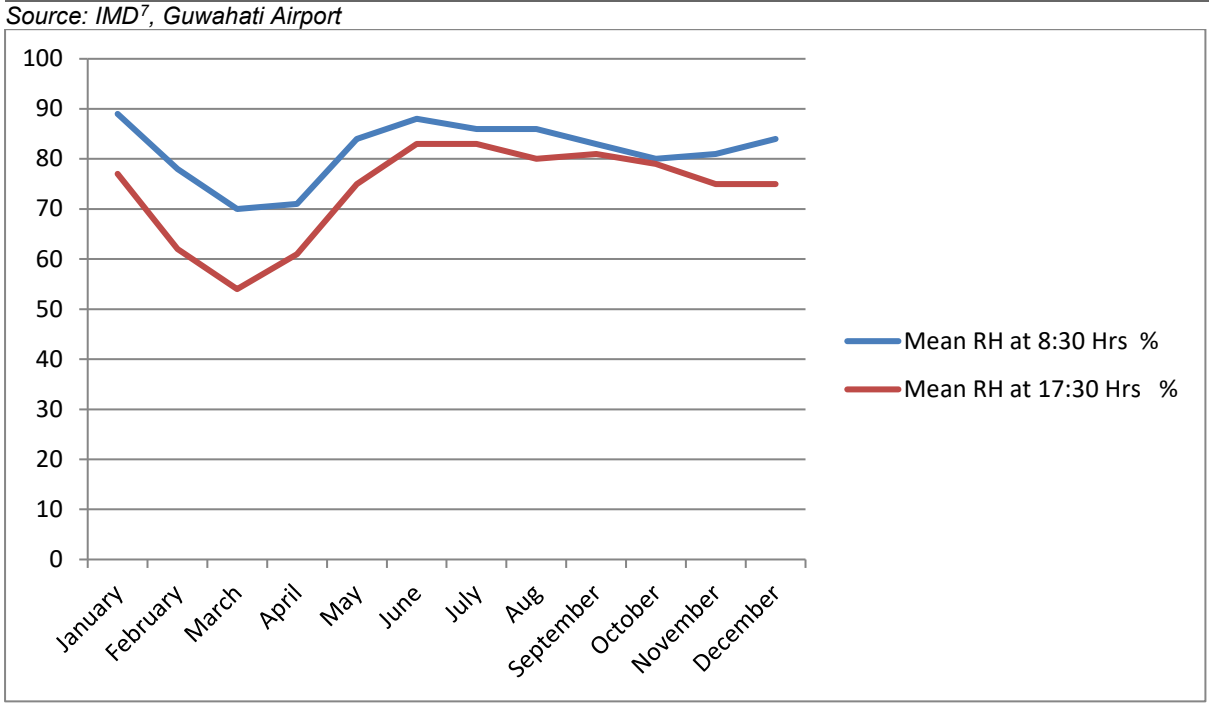
4.9.2 Relative Humidity

40. Normally, May to August months is humid and September to April are dry. The relative humidity (expressed in percentage) is maximum in the months of June and touches 88% and lowest being 61 %in the month of April. The maximum relative humidity ranges from 71 to 88% in morning hours and 61 to 83% in the evening hours. Relative humidity is given in below Table 4-3

Table 4-3: Mean Relative Humidity recorded in 2021 at Guwahati Airport IMD Station

Month	Mean RH at 8:30 Hrs. (%)	Mean RH at 17:30 Hrs. (%)
January	87	77
February	78	62
March	70	54
April	71	61
May	84	75
June	88	83
July	86	83
Aug	86	80
September	83	81
October	80	79
November	81	75
December	84	75

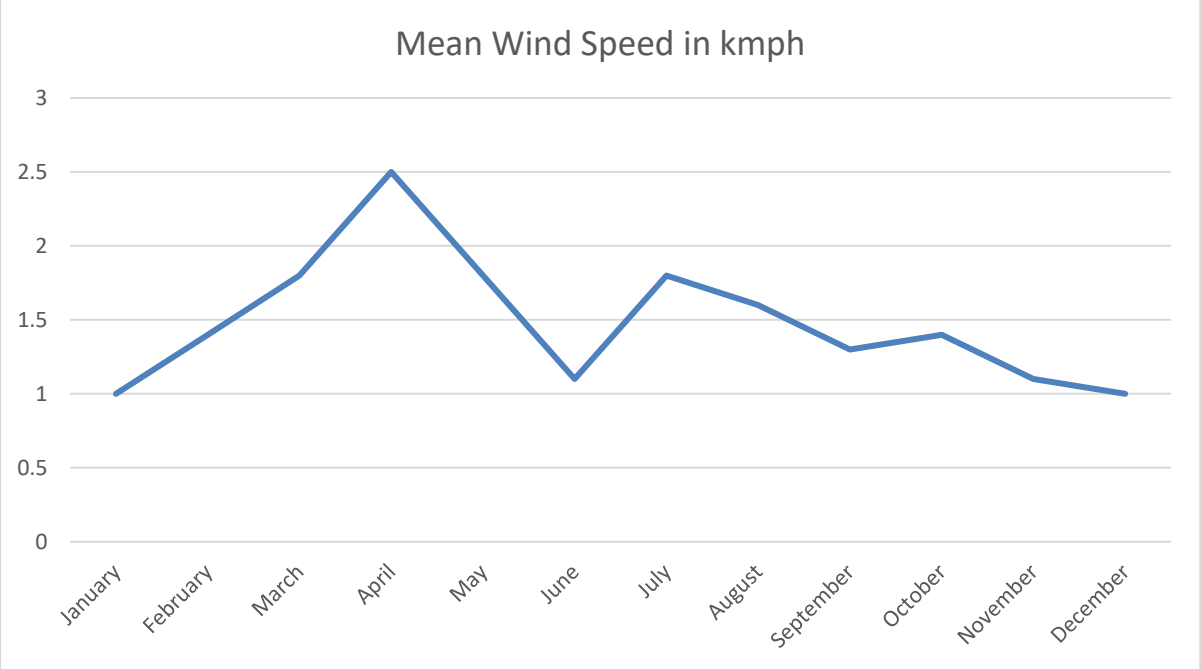
Source: IMD[7], Guwahati Airport



4.9.3 Wind

41. The predominant wind direction in the project area is Northeast during both morning and evening hours. The surface wind data distribution of the Study area gives an average range of 1 – 2.5 kmph. Wind distribution pattern for the study area shows that the average wind speed is higher in month of March, April, May, and July.

[7] *RH data not available for Moinbori area, hence data taken from ESIA report for Beki and Buridehing river basin works.*



Source: IMD, Guwahati

Figure 4-4: Monthly Average Wind Speed around Study Area (2022)

4.9.4 Rainfall[8]

42. Month wise cumulative rainfall data for the years 2015 to 2020 is represented in the Table 4-5below. The rainfall occurred maximum in the months of June, July, and August. The normal annual rainfall varies from 2600 to 4200mm. Maximum rainfall has occurred in the year 2015, 2019 and 2020. The monsoon sets in the month of May and continues up to mid-September.

Table 4-4: Rainfall data (in mm) from 2015 to 2020 at Barpeta District

Year	January	February	March	April	May	June	July	August	September	October	November	December	Annual Rainfall
2015	7.6	5.4	37.3	208.4	466	907.4	341.6	861.7	328.6	21	22.8	11.1	3218.9
2016	7.8	0.5	52	340.1	340.7	580.8	712.8	122.7	363	112.7	0	0	2633.1
2017	0	41.5	56.8	352.3	215.1	542.6	391	679.9	645.8	204.4	10.1	0	3139.5
2018	0.3	11.6	82.2	157.6	467.6	522.1	626.4	236.5	747	63.4	22.9	12.7	2950.3
2019	0	35.4	40.3	189.2	647.6	469.1	1273	190.3	344.3	66.8	16.3	0	3272.3
2020	6.3	28.3	13.5	75	644.4	979	1173.1	280.6	869	112.5	18.6	7.3	4207.6

Source :IMD

[8] *As Rainfall data is not available for Moinbori area, hence rainfall data taken from ESIA report of Beki and Buridehingbasin.*

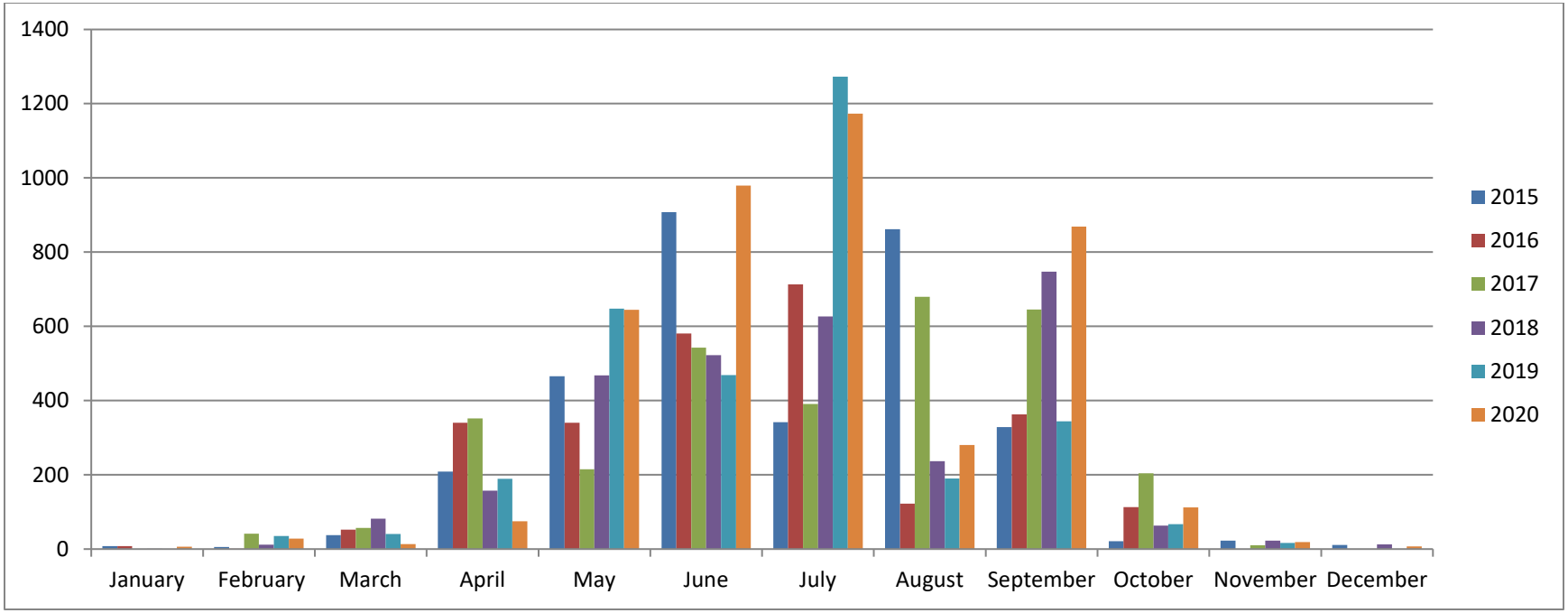


Figure 4-5: Rainfall distribution in Barpeta District

4.9.5 Ambient Air Quality

43. Main Sources of Air pollution in the district are Industrial (Brick Industry/crusher), Vehicular traffic, and Domestic cooking (Rural areas). Ambient air quality monitoring has been regularly carried out at the main town of Barpeta District. No drastic effect on ambient air quality has been noticed.[9]

44. Ambient air quality monitoring shall be conducted by contractor before start of construction activities and the result of monitoring shall be taken as baseline for those locations and accordingly Air quality shall be maintained till the completion of work.

4.9.6 Ambient Noise Levels

45. The existing noise sources are mainly from crowds, machineries used in agricultural field, pumps, two-wheelers, three-wheelers, motor vehicles plying on the roads. Ambient noise level Shall be monitored by contractor before the start of work, and the monitoring result will be taken as baseline and accordingly noise level shall be maintained till the completion of work.

46. Moreover, the noise level during construction period may be increased, though temporarily at specific locations, which needs to be monitored near sensitive receptors against the Ambient Noise Quality Standards set by CPCB And accordingly mitigation measure will be implemented if noise level crosses the standards limit.

4.9.7 Surface Water Quality

47. Periodic monitoring has been carried out by Pollution Control Board of Assam on quality of water bodies in the Barpeta district as per MINARS programme. No drastic change of water quality has been noticed.[10]

48. The surface water quality monitoring shall be conducted by contractor before start of construction activities and the result of monitoring shall be taken as baseline for those locations and accordingly surface water quality shall be maintained till the completion of work.

4.9.8 Ground Water Quality

49. The projected demand of ground water for domestic and industrial uses up to 2025 is estimated to be about 59.59 mcm and 524.05 mcm of water is still available for future irrigation development. . The ground water quality of the Barpeta district reflected that ground water is fresh and suitable for both domestic and irrigation purposes except higher content of iron which requires treatment before being used for drinking purposes.[11]

50. The ground water quality monitoring shall be conducted by contractor before start of construction activities and the result of monitoring shall be taken as baseline for those locations and accordingly ground water quality shall be maintained till the completion of work.

4.10 Biological Environment

4.10.1 Forest Profile

51. As per the Land use land cover map of 10km buffer zone of the Moinbori project areas only 0.59 % ha of areas falls under dense vegetation or forest cover, which is far away from proposed location

[9] *Source- District Environmental Plan , Barpeta District, October'2021, Office of the District Commissioner, Barpeta*
[10] *Source- District Environmental Plan , Barpeta District, October'2021, Office of the District Commissioner, Barpeta*
[11] *Source- Ground Water Information Booklet, Barpeta District Assam, November 2013, Central Ground Water Board*

for Anti erosion works. The Manas national park is situated approx. 45 KM of distance from nearest location of proposed sub projects.

4.10.2 Flora and Fauna

52. Assam's Rich Biodiversity: Biodiversity refers to the variety of life forms at all levels of organization, from gene through species to higher taxonomic forms and also includes the variety of ecosystems and habitats as well the processes occurring therein. Biodiversity is fundamental to the fulfillment of human needs; a biodiversity rich region offers wide options and opportunities for sustaining human welfare including adoption to changes. The State of Assam is a constituent unit of the Eastern Himalayan Biodiversity Region; one of the two biodiversity "Hot Spots" in the country. The climatic condition and wide variety in physical features witnessed in Assam have resulted in a diversity of ecological habitats such as forests, grasslands, wetlands, which harbour and sustain wide ranging floral and faunal species placing. Assam is known for its ecological diversity, for the range of floral and faunal species. The flora and fauna in the project surroundings are given below:

Table 4-5:Terrestrial Flora in Barpeta[12]

Sr.No.	Local/ Common Name	Scientific Name	Family	IUCN Status
1	Banana tree	Musa sp	Musaceae	LC
2	Ahotgos	Ficus religiosa	Moraceae	Not Evaluated
3	Bel	Aegle marmelos	Rutaceae	NT
4	Aloe vera	Aloe vera	Asphodelaceae	Not Evaluated
5	Silikha	Terminalia chebula	Combretaceae	LC
6	Pachatia	Vitex negundo	Lamiaceae	Not Evaluated
7	Kopou	Rhynchostylis retusa	Orchidaceae	EN
8	Nahor	Mesua ferrea	Calophyllaceae	Not Evaluated
90	Kadam	Anthocephalus chinensis	Rubiaceae	Not Evaluated
10	Neem	Azadirachta indica	Meliaceae	LC
11	Paan	Piper betle	Piperaceae	Not Evaluated
12	Tamul	Areca catechu	Arecaceae	Not Evaluated
13	Gendhai	Tagetes sp.	Asteraceae	Not Evaluated
14	Jati bah	Bambusa tulda	Poaceae	Not Evaluated
15	Jamun	Syzygium cumini	Myrtaceae	LC
16	Brahmi	Bacopa monnieri	Plantaginaceae	LC
17	Tal	Borassus flabellifer	Arecaceae	Not Evaluated
18	Simalu	Bombax ceiba	Malvaceae	LC

[12]*Specific Flora data for Moinbori is not available. Data of Barpeta district has been taken from ESIA of Beki and Buridehing under AIRBMP*

Sr.No.	Local/ Common Name	Scientific Name	Family	IUCN Status
19	Kud-jolokia	Capsicum annuum	Solanaceae	LC
20	Golnemu	Citrus aurantiifolia	Rutaceae	Not Evaluated
21	Kajinemu	Citrus limon	Rutaceae	Not Evaluated
22	Nayantara	Catharanthus roseus	Apocynaceae	Not Evaluated
23	Manimuni	Centella asiatica	Apiaceae	LC
24	Tejpat	Cinnamomum tamala	Lauraceae	LC
25	Kola kochu	colocasia affinis	Araceae	Not Evaluated
26	Buwal	Vachellia nilotica	Fabaceae	Not Evaluated
27	Aparajita	Clitoria ternatea	Fabaceae	Not Evaluated
28	Haldhi	Curcuma sp	Zingiberaceae	Data Deficient
29	Dubori bon	Cynodon dactylon	Poaceae	LC
30	Outenga	Dillenia indica	Dilleniaceae	LC
32	Man dhania	Eryngium foetidum	Apiaceae	Not Evaluated
33	Jobaphul	Hibiscus rosa-sinensis	Malvaceae	Not Evaluated
34	Mosundari	Houttuynia cordata	Saururaceae	Not Evaluated
35	Jetuka	Lawsonia inermis	Lythraceae	Not Evaluated
36	Durunsaak	Leucas aspera	Lamiaceae	Not Evaluated
37	Aam	Mangifera indica	Anacardiaceae	Data Deficient
38	Pudina	Mentha spicata	Lamiaceae	Not Evaluated
39	Narasingho	Bergera koenigii	Rutaceae	LC
40	Sewali phul	Nyctanthes arbor-tristis	Oleaceae	LC
41	Tulasi	Ocimum tenuiflorum	Lamiaceae	Not Evaluated
42	Jaluk	Piper nigrum	Piperaceae	Not Evaluated
43	Madhuriaam	Psidium guajava	Myrtaceae	LC
44	Dalim	Punica granatum	Lythraceae	LC
45	Jam	Syzygium cumini	Myrtaceae	LC
46	Arjun	Terminalia arjuna	Combretaceae	Not Evaluated
47	Gomari	Gmelina arborea	Lamiaceae	LC
48	Agaru	Aquilaria malaccensis	Thymelaeaceae	CR
49	Bogori	Ziziphus jujuba	Rhamnaceae	LC

Sr.No.	Local/ Common Name	Scientific Name	Family	IUCN Status
50	Teak	Tectona grandis	Lamiaceae	Not Evaluated
51	Jackfruit	Artocarpus heterophyllus	Moraceae	Not Evaluated
52	Sugarcane	Saccharum sp.	Poaceae	Not Evaluated
53	Kordoi	Averrhoa carambola	Oxalidaceae	Not Evaluated
54	Krishnasura	Delonix regia	Fabaceae	LC
55	Drumstick	Moringa oleifera	Moringaceae	Not Evaluated
56	Amora	Spondias mombin	Anacardiaceae	LC
57	Jolphai	Elaeocarpus serratus	Elaeocarpaceae	Not Evaluated
58	Khejur	Phoenix sylvestris	Arecaceae	Not Evaluated
59	Radhachura	Caesalpinia pulcherrima	Fabaceae	LC
60	Robantenga	Citrus maxima	Rutaceae	LC
61	Papaya	Carica sp.	Caricaceae	Data Deficient

Table 4-6:Terrestrial Fauna in Beki

Sr.No.	Local/Common Name	Scientific Name	Family	IUCN Status
1	Rhesus macaque	Macaca mulatta	Cercopithecidae	LC
2	Jackal	Canis aureus	Canidae	LC
3	Fox	Vulpes bengalensis	Canidae	LC
4	Indian civet	Viverra zibetha	Viverridae	LC
5	Wild boar	Sus scrofa	Suidae	LC

Table 4-7: Aquatic Flora in Beki:

Sr.No.	Local/ Common Name	Scientific Name	Family	IUCN Status
1	Lotus	Nelumbo nucifera	Nelumbonaceae	LC
2	Water hyacinth	Eichhornia crassipes	Pontederiaceae	LC
3	Moneywort	Lysimachia nummularia	Primulaceae	LC
4	Water lily	Nymphaea sp.	Nymphaeaceae	LC
5	Water spinach	Ipomoea aquatica	Convolvulaceae	LC
6	Hydrilla	Hydrilla verticillata	Hydrocharitaceae	LC
7	Duck weed	Lemna minor	Araceae	LC
8	Pond weed	Monochoria vaginalis	Pontederiaceae	LC

Table 4-8:Aquatic Fauna in Beki

Sr.No.	Local/ Common Name	Scientific Name	Family	IUCN Status
1	Dhurasaap	Xenochrophis piscator	Colubridae	LC
2	Prawn	Fenneropenaeus indicus	Penaeidae	Not evaluated
3	Ilish	Tenualosa ilisha	Clupeidae	NT
4	Chital	Chitala chitala	Notopteridae	NT
5	Boriala	Barilius barila	Cyprinidae	LC
6	Puthi	Pethia ticto	Cyprinidae	LC
7	Bhokua	Labeo catla	Cyprinidae	LC
8	Singora	Mystus vittatus	Bagridae	LC
9	Rou	Labeo rohita	Cyprinidae	LC
10	Pabha	Ompok bimaculatus	Siluridae	NT
11	Tinkaitiya	Batasio batasio	Bagridae	LC
12	Magur	Clarias batrachus	Clariidae	LC
13	Chanda	Chanda nama	Ambassidae	LC
13	Rupchanda	Piaractus Brachypomus	Serrasalmidae	Not evaluated
15	Goroi	Channa punctata	Channidae	LC
16	Kawoi	Anabas testudineus	Anabantidae	LC
17	Singi	Heteropneustes fossilis	Heteropneustidae	LC
18	Borali	Wallago attu	Siluridae	VU
19	Muwa	Mugil cephalus	Mugilidae	LC
20	Kandhuli	Notopterus	Notopteridae	LC
21	Ari	Sperata seenghala	Bagridae	LC

Table 4-9:Avian Fauna in Beki

Sr.No.	Local/ Common Name	Scientific Name	Family	IUCN Status
1	Little cormorant	Microcarbo niger	Phalacrocoracidae	LC
2	Indian cormorant	Phalacrocorax fuscicollis	Phalacrocoracidae	LC
3	Heron	Ardeola grayii	Ardeidae	LC
4	Little egret	Egretta garzetta	Ardeidae	LC
5	Black stork	Ciconia nigra	Ciconiidae	LC
6	Black kite	Milvus migrans	Accipitridae	LC
7	Drongo	Dicrurus macrocercus	Dicruridae	LC

4.10.3 Socio-Economic Survey of Sub-Project Area

53. The objective of this primary survey is to a) understand impacts of riverbank erosion and floods and related issues and the perceptions of the beneficiary communities b) assess to impacts of the proposed subproject on the beneficiary population, c) factor these issues and impacts into the design and implementation of the subproject and d) thus enhance the sustainability of subproject. To this end, a sample of quantitative and qualitative research among the beneficiary communities was conducted. For quantitative research, a household questionnaire was developed, tested, and administered to the sampled beneficiary community households to collect the information on relevant aspects. Also, qualitative research through Focus Group Discussions (FGDs) with beneficiaries' communities, including women and the vulnerable was conducted to assess the impacts and capture their perceptions and aspirations regarding the proposed subproject.

54. Sample size was 123 households of total 673 populations. Socio Economic Survey was conducted for the affected (in a sense benefitted due to the interventions) villages to identify and profiling socio economic status of these communities, demographic profile of the villagers, livelihood, economy, education status, etc.

55. The household survey and FGDs were conducted from November 2023 to December 2023. The data collected was entered and processed in a customized database after scrutiny. The findings of the primary survey are presented in the following sections.

4.10.4 Sample Selection

56. Sample Households were selected using random sampling. 20 HH were selected from each AE location and 1 – 2 FGDs cum consultations including women and vulnerable were conducted with the population and beneficiaries in each location. A total of 123 household were selected for socio economic survey considering 20% sample size of total HH from each project village

4.10.5 Demographic Profile of Households

4.10.6 Distribution by Age Group

57. The table below provides the distribution of sampled population. From the table it is evident that around 8.32 percent of the members of sampled households are below 5 years of age while around 56% are in the age group of 18-60, i.e., they are in the working age group. 6.69 percent are more than 60 years, and 29 percent are in the age group of school-going children.

Table 4-10: Sample Population Age

Sample population Age		
	Nos	**Percent**
Less than 5 years	56	8.32
5 - 18 years	195	28.98
18 - 45 years	291	43.24
45 - 60 years	86	12.78
More than 60 years	45	6.69
Total	**673**	**100**

4.10.7 Gender

58. Out of 673 sample population, and 123 socio economic surveyed households' 92.68 percent are male members and 7.31 percent are female members. The detailed distribution of sampled population is presented in table below.

Table 4-11: Distribution of Head of Household by Sex

Name of Villages	Male		Female	
	Number	%	Number	%
Hatchara	21	18.42	0	0
Paschim Moinbari	19	16.67	1	11.11
Kismat Moinbari	18	15.79	2	22.22
Joypur	19	16.67	1	11.11
Sikartari	20	17.57	0	0
Tarakandi NC	17	14.91	5	55.55
	114	100	9	100

4.10.8 Family Size

59. The family size of the sampled households surveyed was found to be around 5.47, which is just near to the state has average household size 5.5 (Census 2011). 10.5 percent of the families are nuclear and small with a size of 1-3 persons, 79.72 percent with a size of 3-7 persons. About 9.8 percent of family has more than 7 persons. Distribution of households on the basis of family size is presented in detail in the following table.

Table 4-12 Family size of sample HH

Family Size of Sample HH		
	Nos	Percent
1 - 3 Member	13	10.57
3 - 5 Member	52	42.28
5 - 7 Member	43	34.96
More than 7 Member	15	12.20
Total	**123**	**100**

4.10.9 Religious Composition

60. 100% of the sampled households belong to Muslim religion. Distribution of households on the basis of religion is presented in table below.

Table 4-13: Religion details of sample HH

Religion Details of Sample Household		
	Nos	Percent
Hindu	0	0.00
Muslim	123	100.00
Others	0	0.00
Total	**123**	**100.00**

4.10.10 Social Category (Caste)

61. Caste-wise distribution of the sampled households reveals that the 100 % populations are minority. The details are given in the table.

Table 4-14: Project Village wise and Caste wise Population Concentration at Moinbori

Particulars	Name of villages					
	Sikartari	Hatchara	Paschim Moibari	Kismat Moinbari	Joypur	Tarakandi NC
Households	20	21	20	20	20	22
Population	102	99	103	127	128	114
General Population	0	0	0	0	0	0
Schedule Caste Population	0	0	0	0	0	0
Schedule Tribe Population	0	0	0	0	0	0
Minority Population	102	99	103	127	128	114
OBC Population	0	0	0	0	0	0

4.10.11 Ration Card Details

62. One of the indicators for HH economic condition is having a ration card. 80.49 percent HH possess Antyodaya Card (AAY) which is the poorest families from amongst Below Poverty Line (BPL) families. 19.51 % of family does have any card and none of HH falls under APL categories..

Table 4-15: Ration card details

Ration Card Details		
	Nos	Percent
APL	0	0.00%

Ration Card Details		
	Nos	Percent
Antyodaya (AAY)[13]	99	80.49%
No Card	24	19.51%
Total	**123**	**100%**

4.10.12 Education Details

63. From the sample survey, the educational qualifications of population covered indicate that only 22.88 % of population are illiterate and remaining are literate out of which 5.94 percent having informal education from Anganwadi center, 34.18 percent have education up to ninth class, 9.06 percent with SSC,16.49 percent with intermediate and approx. 5.50 % are having some kind of a college degree and higher education. About 4.90 percent are of not school-going age.

Table 4-16: Education level of sample population

Education Level of Sample Population		
	Nos	Percent
Informal Education (Anganwadi center)	40	5.94
Illiterate	154	22.88
Class 1-9	230	34.18
Class 10	61	9.06
Intermediate	111	16.49
Graduate	37	5.50
Postgraduate	6	0.89
Professional	1	0.15
NA (Age less than 3years)	33	4.90
Total	**673**	**100**

4.10.13 Occupational Details

64. Table below provides the details of occupation of household members of the sample surveyed. From the table, it is evident that around 33.13 percent of total members are engaged in some economic activity (excluding students, young children of non-school going age, housewives and old and retired). As per Census 2011, 38.36% members of the Assam Population are worker. The primary occupation of sampled population indicates that 17.83 percent are farmers and about 1.19 percent are agricultural labour. While 2.67 percent are skilled workers and 3.86 percent are unskilled workers. Primary occupations of the population covered are presented below.

Table 4-17 Occupation of sample population

[13] This card is issued to households that are identified as Antyodaya families by the government. Each household is entitled to 35kg of food grains per month per family.

Occupation of Sample Population		
	Nos	Percent
Housewife	160	23.77
Retired/Old Age	19	2.82
Farmer	120	17.83
Agri. Labour	8	1.19
Skilled Labour	18	2.67
Unskilled Labour	26	3.86
Traditional Artisan	0	0.00
Self Employed	29	4.31
Govt. Service	7	1.04
Pvt. Service	14	2.08
Others (business)	1	0.15
Petty shop	0	0.00
NA (Baby, 1-2 years)	26	3.86
Business	0	0.00
Student	213	31.65
Others (Not working)	32	4.75
Total	**673**	**100**

4.10.14 Vulnerability

65. About 9.50 percent are categorized as vulnerable population. Out of total sampled population 70.31 percent are persons above 60 years age and 26.56 percent is widow. no one reported as disabled in the sampled survey, 1.56 % are divorced & unmarried women, the vulnerable category details are given below in table

Table 4-18: Vulnerable population among sample

Vulnerable among sample population		
	Nos	Percent
Disabled/ Differently Abled	0	0
Widow	17	26.56
Person above 60 years age	45	70.31
Unmarried woman	1	1.56
Divorcee/Separated	1	1.56

Vulnerable among sample population		
	Nos	Percent
Not Applicable	0	0
Total	**64**	**100.00**

4.10.15 Housing Pattern

66. The study has captured data on house ownership of the sampled households. The table shows that 100 percent of the households are self-owned..

Table 4-19 Ownership of house

Ownership of House		
	Nos	Percent
Owned	123	100
Rented	0	0
Total	**123**	**100**

67. About 58.54 percent of the total sampled households are in kutcha structures and 40.65 percent are in semi-pucca structures and 0.81 percent live in pucca houses

Table 4-20: Type of house structure

Type of House Structure		
	Nos	Percent
Kutcha (GCI sheet Roof, GCI sheet Wall and Kutcha floor)	72	58.54
Semi pucca	50	40.65
Pucca	1	0.81
Bamboo	0	0
Others	0	0
Total	**123**	**100**

4.10.16 Sanitation Facilities

68. All of the households (100%) reported that toilet facilities are available within the premises and respondents confirmed that the members of the family use the toilet facilities regularly.

Table 4-21: Sanitation facilities of sample HH

Sanitation Facilities of Sample HH		
	Nos	Percent
Latrine	123	100

Sanitation Facilities of Sample HH	Nos	Percent
No Latrine/ Outside (open place)	0	0
Total	**123**	**100**

4.10.17 Household fuel Usage Details

69. 37.39 % of the surveyed household uses firewood and 60.97 percent of HH uses LPG & firewood both as fuel for domestic uses.

Table 4-22: Type of different fuel used by HH.

Type of Different Fuel Used by HH	Nos	Percent
Firewood	46	37.39
Firewood and LPG	75	60.97
Firewood and Electric Stove	1	0.81
Coal	0	0
Natural Gas	0	0
LPG	1	0.81
Electric Stove	0	0
Total	**123**	**100**

4.10.18 Income

70. Income and asset ownership are indicators which would, to some extent, indicate the households' living standards. The study has captured the economic and asset profile of the sampled households. There are 0.81 percent households having average monthly incomes of less than Rs. 5000 per month. There are about 47.15 percent households having monthly incomes of Rs 5,000 – 10,000. About 52.03 percent have monthly incomes more than Rs 10,000., the village wise income details of surveyed area given in below tables.

Table 4-23: Average monthly income

Average Monthly Income	Nos	Percent
Less than Rs 1500	0	0
Rs 1501 - 3000	0	0
Rs 3001 – 5000	1	0.81
Rs 5001 - 10000	58	47.15
More than Rs 10000	64	52.03

Average Monthly Income	Nos	Percent
Total	**123**	**100**

Table 4-24 Average Annual Income of the Total Families in Different Project Locations

Name of Villages	< 50000	>50000 - < 100000	>100000 - < 250000	>250000 - < 400000	>400000 - < 500000	>500000	Total
Sikartari	0	3	14	3	0	0	0
Hatchara	0	3	15	3	0	0	0
Paschim Moinbari	0	2	13	5	0	0	0
Kismat Moinbari	0	5	14	1	0	0	0
Joypur	0	2	16	2	0	0	0
Tarakandi NC	0	4	14	4	0	0	0
Total	**0**	**19**	**86**	**18**	**0**	**0**	**123**

4.10.19 Household Assets Details

71. There are 46.3 percent of households own cycles, 14.63 percent have two-wheelers, the details of assets owned by surveyed HH is given in below table.

Table 4-25: Assets owned.

Assets Owned	Nos	Percent
Cycle	57	46.3
Cycle and Spray Pump	7	5.6
Cycle and Harvester	1	0.81
Cycle and Three-Wheeler	4	3.25
Cycle and Two-Wheeler	19	15.44
Cycle and TV	1	0.81
Cycle and Tractor	1	0.81
Cycle, Two-Wheeler, and Four-Wheeler	2	1.62
Cycle, Two-Wheeler, and Spray Pump	4	3.25
Solar plate/panel for power generation	1	0.81

Assets Owned		
	Nos	Percent
Two-Wheeler	18	14.63
Two-wheeler, 4-Wheeler, and Spray Pump	1	0.81
Two-Wheeler and TV	1	0.81
Three-Wheeler	1	0.81
Four-Wheeler	0	Nil
Harvester	0	Nil
Sprayer	1	0.81
Cultivator	0	Nil
Sprinkler	0	Nil
Tractor	0	Nil
Television	0	Nil
Refrigerator	0	Nil
No assets	37	30.08

4.10.20 SHG Membership

72. From the tables below, 24.40 percent of sampled Households members have membership in Self Help Groups (SHG).

Table 4-26: SHG membership of sample HH

HH members who have SHG membership		
	Nos	Percent
SHG Member	30	24.40
No	93	75.60
Total	**123**	**100.00**

73. Out of total SHG members, 21.95 percent oh HH have one member in SHGs, 1.62 percent HH has two members in SHGs and 0.81% has three members in the self-help groups.

Table 4-27: No of family member who have SHG membership.

No of Family Member who have SHG membership		
Nos.	Nos	Percent
No Membership		
1	27 HH have 1 Member	21.95

No of Family Member who have SHG membership		
Nos.	**Nos**	**Percent**
2	2 HH have 2 Members	1.62
3	1 HH has 3 Members	0.81
Total	**34 Members in 30 HH**	

4.10.21 Disaster Related

74. When asked about the disaster faced by HH in recent times, 100percentof surveyed population reported prone to both flood and riverbank erosion

Table 4-28: Sample HH who prone to disaster recently

Sample HH who are prone to disaster recently		
	Nos	**Percent**
Riverbank erosion	123	100.00
Flood and Riverbank erosion	123	100.00
Total	**123**	**100.00**

4.10.22 Floods

75. Almost 100 of surveyed HH reported that they did not shift to any other places during floods. 23 percent said they took shelter either on roadside, schools, embankment or high/elevated area, the details of HH shifted to other places are given in below table.

HH Shifted During Flood		
	Nos	**Percent**
Roadside	11	47.83
Flood Shelter	5	21.74
School/college	6	26.08
Others	0	0.00
Not Shifted	0	0.00
Embankment or high elevated places	1	4.35
Total	**23**	**100.00%**

76. When asked for reasons for not shifting during the floods, 79.67 percent reported they live in an elevated house, less than one percent reported they did not envisage the magnitude of floods.

Table 4-29: Reasons for not shifting during floods.

Reasons for Not Shifting during Flood		
	Nos	Percent
Did not envisaged	1	0.81
Safeguarding assets	1	0.81
Not effected due to elevated / flood resilient houses	98	79.67
Shifted	23	18.70
Total	**123**	**100.00**

77. The loss suffered during floods, 42.27 percent HH has suffered crops loss, 0.81 percent HH lost animals & other assets, 2.44 percent HH lost crops & livelihood the details of HH suffered due to flood is given below in table.

Table 4-30: HH suffered loss due to floods.

HH Suffered Loss due to Flood		
	Nos	Percent
House Loss	1	0.81
House Loss, Crop loss	1	0.81
House Loss, Crop loss, Livelihood loss	1	0.81
House Loss, Tree loss	1	0.81
Land loss, Tree loss	1	0.81
Crop loss	52	42.27
Crop loss, Tree loss	10	8.13
Crop loss, Animal loss, Tree loss	3	2.44
Animal loss	1	0.81
Asset loss	1	0.81
Animal Loss, Crop loss, Livelihood loss	1	0.81
Asset loss, Animal Loss, Crop loss, House loss	1	0.81
Asset loss, House loss	1	0.81
Animal loss, Asset loss, Crop loss	2	1.63
Animal loss, Asset loss, Livelihood loss, Crop loss	1	0.81
Animal loss, Asset loss, House loss, Livelihood loss, Crop loss	1	0.81
Animal loss, Asset loss, House loss, Crop loss	1	0.81
Animal and Asset loss	1	0.81
Animal loss, House Loss, Crop loss, Livelihood loss	2	1.63

HH Suffered Loss due to Flood		
	Nos	Percent
Crop Loss, Animal loss	5	4.06
Animal loss, Trees Loss	2	1.63
Animal loss, Livelihood Loss	1	0.81
Animal loss, Crop loss, Livelihood Loss	1	0.81
Livelihood loss	2	1.63
Crop loss, Livelihood Loss	3	2.44
Animal loss, Crop loss, House Loss	2	1.63
Animal loss, House Loss, Crop loss, Livelihood loss, Human loss, Asset loss, Tree loss, Boat loss	1	0.81
Animal loss, House Loss, Crop loss, Livelihood loss, Asset loss	1	0.81
Asset loss, Crop loss	1	0.81
Tree Loss	1	0.81
Tree Loss, Livelihood loss	1	0.81
Loss of Fish from Pond	1	0.81
No Loss	18	14.63
Total	**123**	**100.00**

4.10.23 Riverbank Erosion

78. Out of total, 57.71 percent has expressed that they have suffered some kind of loss due to riverbank erosions. About 7.31. percent HH lost animals. 37.4 percent lost land in erosion and 3.25 percent suffered assets and losses. 44.4 percent reported no loss, the details of loss suffered due to bank erosion in given in below table.

Table 4-31: Loss suffered during riverbank erosion.

HH Suffered Loss due to erosion		
	Nos	Percent
House Loss	1	0.81
Land loss, Tree loss, Crop loss	2	1.63
House Loss, Tree loss, Land loss	2	1.63
Land loss, Tree loss	4	3.25
Crop loss	1	0.81
Crop loss, Land loss	2	1.63

HH Suffered Loss due to erosion		
	Nos	Percent
Land loss	42	34.14
Animal loss	1	0.81
Asset loss, House loss	1	0.81
Land loss, House loss	2	1.63
Asset loss, Animal Loss, House loss	1	0.81
Asset loss, Land loss	2	1.63
Animal loss, Land loss, Tree loss	1	0.81
Animal loss, Asset loss, House loss, Land loss	2	1.63
Animal and Land loss	1	0.81
Animal loss, House Loss, Land loss	3	2.44
Animal loss, Trees Loss	1	0.81
Animal loss, Crop loss, House Loss	1	0.81
Tree loss	1	0.81
No Loss	52	42.27
Total	**123**	**100.00**

79. Out of total surveyed HH, 30 percent stated yes when asked how much land was eroded. 8.11 percent lost 5-10 bigha land, 72 percent lost 1-5 bigha land. About 16 percent HH said they lost less than 1 bigha, whereas for 2.70 percent HH more than 10 bigha land was eroded.

Table 4-32: Land loss due to erosion

Land Loss due to erosion		
	Nos	Percent
Less than 1 Bigha[14]	6	16.22
1 - 3 Bigha	21	56.75
3 - 5 Bigha	6	16.21
5 - 10 Bigha	3	8.11
More than 10 Bigha	1	2.70
Total	**37**	**100.00**

80. The land left after erosion, about 48 percent became landless, 24 percent HH said they were left with less than 1 bigha, 21 percent left with 1-3 bigha land and 5.40 percent were left with 3-5 bigha

[14] *One Bigha is 0.3306 acre or 1.340 sq. m.*

Table 4-33: Land left after erosion.

Land left after erosion		
	Nos	**Percent**
Less than 1 Bigha	9	24.32
1 - 3 Bigha	8	21.62
3 - 5 Bigha	2	5.40
5 - 10 Bigha	0	0.00
More than 10 Bigha	0	0.00
No land	18	48.64
Total	**37**	**100.00**

4.10.24 Participation, Perception, and Information

4.10.25 Participation

81. Regular consultations are being conducted in subproject area. 100 percent HH has expressed that they are aware of the proposed subproject t.

Table 4-34: HH awareness about the subproject

HH awareness about the subproject		
	Nos	**Percent**
Aware	123	100.00
Not Aware	0	0.00
Total	**123**	**100.00**

82. For 47.15 percent HH the source of information on the proposed subproject is Village Head (Gaon Bura). Likewise, for 15.44 percent HH, the source is WRD, and 37.40 percent HH source is friends and relatives. etc.

Table 4-35: HH source of information about the project

HH Source of information about the project		
	Nos	**Percent**
WRD	19	15.44
Village Head	58	47.15
Friends/Relative	46	37.40
Total	**123**	**100.00**

83. Out of 123 samples, 100 percent expressed their willingness to work during project.

Table 4-36: HH willingness to work during project implementation.

HH willingness to work during project implementation		
	Nos	Percent
Willing to work	123	100
No	--	-
Total	**123**	**100**

84. 47.15 percentage of HH out of the sample expressed willingness for female HH members to work during project implementation. 52.85 percent said they need to look after the domestic work. The reason for not willing to work is that, they need to look after domestic works. .

Table 4-37: Female HH member willingness to work.

Female HH Member willingness to work during project implementation		
	Nos	Percent
Yes	58	47.15
No	65	52.85
Total	**123**	**100**

4.10.26 Perception

85. This is an emergency work for riverbank protection needs to be carried out immediately to protect the Agricultural land, community establishment. Public utilities etc. from being eroded, as riverbanks are getting eroded at faster rate and as per Satellite imagery the approx. 2 km of area has been washed away in last 5 years. The proposed subproject will help to protect the riverbank and communities residing on the vicinity of the project areas, and it has positive impacts on the environmental and socio-economic status of the project area. A good number of these impacts will be beneficial; especially the area will be resilient to floods and riverbank erosion which implies no human and animal loss, land loss and livelihood loss, etc.

86. Temporary environment impact, like impact of Air quality due to dust emission and vehicular emission by movement of vehicles, running of DG sets are anticipated during the execution of project, this impact shall be mitigated with site specific ESMP during the implementation of project. This chapter deals with the identification of those risks and impacts.

87. Some of the expected benefits of the project are as under

- No Human and Animal Loss
- No loss of land due to erosion
- No loss of house and assets due to erosion
- No loss of trees and crops due to erosion
- Common Property Resources will remain safe
- Environmental improvements
- Improvements in quality of life
- Safeguarding the main road connecting 40 villages (approximately) from being eroded away.

88. The project will monitor this situation and document these benefits during the life of the project.

89. During the social assessment surveys the perceived benefits of the AE works were shared with the community in general including the affected household. The various positive impacts of proposed river bank protection works are mentioned in below table.

Table 4-38: Perception of HH – Positive impacts due to sub project

Perception of HH - Positive Impacts due to subproject		
	Nos	Percent
No loss of human	123	100.00%
No loss of land	123	100.00%
No loss of house/assets	123	100.00%
No loss of crop/trees	123	100.00%
No loss of livelihood	123	100.00%
Children Education	123	100.00%
Safeguard of CPR	**123**	**100.00%**

4.10.27 Perceived Negative Impacts

90. Along with the perceived benefits stated by the respondents, none of the respondent expresses any negative impact due to the sub project activities, few of the villagers are also have the opinion that, due to the construction activities there might be temporary negative impact like, disturbance due to construction activities, Community health & safety due to labout influx and accident due to vehicular movement etc.,

Table 4-39: Perception of HH – Negative impacts

Perception of HH - Negative Impacts of Project		
	Nos	Percent
Loss of Land	123	100.00
Loss of Tress	123	100.00
No access to river	0	0.00
Disturbance due to construction activities	33	26.83
Disturbance due outside labour	21	17.07
Accident due vehicle movement	2	1.63

4.10.28 Suggestions

91. To overcome the perceived negative impacts of the subproject the respondents suggested some measures which may be helpful. The details of suggestions offered by respondents are presented in table, which illustrates that.

    - 100 percent of respondents stated that local labour need to engage during civil works.

- 100 percent of respondents stated that the subproject would be successful only if work is completed before the onset of the monsoon.
- 100 percent of respondents have expressed that during construction, a dedicated way for all constriction activities to drawn in the village which will not create disturbance to day-to-day villages activities and will help in reducing social and environmental risks.

- 93.50 % respondents stated that the regular dissemination of information of project activities will be help in project success and timely completion.

The above are incorporated into the RAP and ESMP as well, as appropriate.

Table 4-40: HH suggestions for better implementation

HH Suggestions for better implementation of the project		
	Nos	**Percent**
Local labour to be engaged	123	100%
Work to be complete before onset of monsoon	123	100%
Dedicated path for construction activities in the village	123	100%
Regular dissemination of information of project activities	**115**	**93.50%**

5 Stakeholder Consultations

92. Several rounds of community consultations were carried out on behalf of the project as an essential part of the process. Consultations were carried out by the officials of FREMAA & WRD and also by NGO team with different level of stakeholders. As an emergency response, the consultations were carried after and also during the initial surveys and social screening for preparing this ESIA. Discussions were held basically with officials from the Departments of Revenue (the circle officer, Laat Mandal), People's representatives at the Gaon Panchayat level (G.P President), Gaon Bura (Govt. servant for the village community), PAPs and women groups among PAPs and general villagers etc. to get a wider view of the issues related to flood and erosion management and explore the possibilities of collaborated efforts in the implementation of the project.

93. During the course of the consultations, the suggestions received from the stakeholders were duly noted and they were also assured that appropriate measures would be taken during the planning and construction phases to minimize inconveniences. The consultations helped to manage expectations, clear misconceptions, disseminate accurate project information and gather stakeholder feedback. The Details of the consultations is given as Annexure 9

94. A summary salient features of these consultations is given below:

General

- General consultations and FGDs were held in the concerned villages of West Moinbori area that are considered for the emergency works at Beki basin in the districts of Barpeta to stop the continuous severe erosion.
- This sub-project taken as emergency response will cover 8 villages (6-AE works and 2 – porcupine) under Barpeta district which ultimately will be covered under the AIRBMP.
- The land to be acquired for the project for anti-erosion works comprises of both Private as well as Government Land.
- A total of 1078 people living in 6 villages will be impacted by the AE works comprising of mostly General category people of minority community. However, there will be no adverse impact in two village out of the targeted 8 villages, as Porcupine installation work is proposed in these two villages.
- The residents of the villages are mostly engaged in agricultural works and daily wage labourers within the agricultural activities and micro-enterprises. Majority of their activities run around agriculture, farming, and share cropping.
- Major crops grown are paddy and winter crops and vegetables like maize, cauliflower, potatoes, and carrots, as well as native greens, etc.
- In all project affected villages under the project, it is found that people are getting benefits of different government projects like free housing, toilet, widow pension, specially abled grants, student scholarships, benefit to registered SHGs, benefits under UJJWALA scheme, etc.
- It is observed that children under different age groups attend school, mostly government schools. But there are also private schools in the vicinity.
- The villages have local marketplaces where the residents sell and buy goods. Except the markets and the school's public health facilities, police stations, post offices, and bus stops etc. are not very close.
- Various Modes of transport facilities are available normally used in the project villages such as are shared taxi-Magic, Auto, Tempo, battery operated rickshaw, bicycle, motor cycle etc.

Disaster Related

- The most recent disaster to hit the villages was floods in the years 2020–2021 and largely the soil erosion in the year 2021. The disaster resulted loss of homes and homestead, land, trees, livelihoods including fishing and agricultural crops, and a few public properties.
- The villagers mentioned that a disaster management plan should be in place in order to manage different aspects during disaster.
- It was informed during the consultations that the erosion in high magnitude had started in 2021. From that time onwards, erosion has washed way at least 10 kilometres of the connecting village road to Moinbori and the adjacent paddy fields and agriculture lands and houses.
- During community consultations, it is revealed that flood early warning by authority is not given, due to which they could not take any precautionary measures; this has led to damage of their

assets. Flood early warnings through public announcements or SMS are suggested by community and they want such system to be developed.

- The villagers also take various self-taught precautions during floods, such as making rafts from banana tree and shifting their cattle, assets and other important things to safer places, etc. The villagers mostly shift to the nearby embankment when flood hits their village.
- As informed by community, the Village Disaster Management & Land Conservation Committee (VLCDMC[15]) when someone needs support and assistance during flood, erosion and other natural calamities, similarly, village headman/Gaon Burha are also very helpful during these times.
- However, there is a need for more cluster and village level committees for improvement of redressal mechanism to address major issues that are faced by the villagers on a regular basis. Community is suggesting for a more equipped and skilled team to address their grievances.

Women and Vulnerable:

- During the disasters like flood and soil erosion, women are the ones who face maximum difficulty like lack of cooking spaces, utensils, safe water, etc. for an average period of 2 to 3 days They also face difficulty in maintaining daily hygiene, etc.
- School going girls complained that their toilets are used by people taking shelter during flood and left uncleaned making them unfit to use by the students. Due to this the girls remain absent for a considerable period.
- The Women and vulnerable communities present in the village are involved in various livelihood activities such as agriculture, daily waged labour, etc. and they are responsible for bringing in the much-needed earnings to the family.
- There are women SHGs in the village initiated under ASRLM and NRLM, involved in various activities such as poultry, agriculture and, micro-finance etc.
- Women do participate decision making at household level but do not participate in the community level committees in the village.
- Women are willing to work during construction of proposed AE and porcupine works,
- Women are also willing to undergo livelihood trainings if provided as their normal livelihoods will be impacted for the emergency AE works.
- They expect early disbursement of compensations for the loss of their household and land, but they are ready to move immediately if needed as saving the land from erosion is prime cause in front of them at this moment.

Table 5-1: Summary of consultation with stakeholder groups

Stakeholder Group	Summary of Issues
Project affected parties at Chikni, Jaurimari, West Moinbori, Takakata, Joypur, and Tarakandi (and also the villagers)	1. The village heads as representative of the villagers made a request that – the PAPs are from economically weaker section and hence they had occupied the government land for their sustenance and livelihood. They will be relieved if the government provides some financial support . He said that –they want government's aid to resettle. 2. Few Shopkeepers want compensation for their shops as their livelihood will be impacted disrupting the source of income. 3. There are NGO's in the village where men groups work together for development of the village community. Though the entities are new, they are registered bodies. They work in the areas of sanitation and water supply. These NGOs requested them to be facilitated about some government schemes during the project tenure. 4. All the PAPs are title holders in some villages. They are ready to cooperate as they have already been losing land to the severe

[15] To keep vigil on the land resources of the village and mobilise public opinion against any unauthorised encroachment thereon or any activity harmful to their existence and report to the iurisdictional circle officer. The committee also encourages and sensitises the village youths and the volunteers about preparedness and response mechanism before, during and post disasters phases.

	erosion. They want the erosion to stop anyhow. They are basically poor farmers, and hence they look forward to having the compensation for the loss of land and property. 5. The most notable of all these is that- villagers are willing to vacate and relocate even if the compensation comes later.
Other interested parties	1. There will be a possibility of temporary access block to the nearby villagers/ communities during construction activities. 2. The community might face problems of labour influx in terms of health and safety issues and utilization of community resources. 3. There are some schools, places of worship, and other buildings close to the proposed construction project. These might get affected. 4. They are aware of the sub-project which was communicated through Gaon Burah and through Circle Officials and Mandal.
FGDs with Female PAPs and disadvantaged/ vulnerable groups.	1. Focal group discussions were held with the PAP women group. 2. Rashida Khatun (Jaurimari), a woman who is vocal about the issues informed that they have many SHGs in the village and women are actively participating in the activities., All the SHGs are registered and they have accounts in the bank. 3. They are willing to participate in livelihood trainings as their present livelihood will be impacted by dislocation. 4. Most of the women said that bank protection through installation of geo-bags should be done for the protection of the area. 5. Mothers of children who are appearing the Board exams are a bit worried if they have to relocate. There are 2/3 female headed households.

5.1 Consultations during Field Work for ESIA

95. Consultations were conducted during preparation of ESIA in all the project site villages. This process saw participation from the villagers, affected persons including women and vulnerable. Focused consultations were also held with women, affected persons, etc. Before the consultations, relevant information in local language was shared with the stakeholders in order to give them information on the project objectives and activities and seek heir feedback and concerns.

During the ESIA consultations, following actions were agreed upon with the stakeholders:

- Primary stakeholders to be consulted during various stages of the project preparation through focused and specific consultations.
- To seek opinions/ suggestions of the communities involved. Specific consultations will be held near the sites/ facilities proposed. The consultations will be documented and shall be shared with the technical teams for consideration if required.

96. The FREMAA/ WRD shall also hold consultations not only with the community but also with the concerned line departments at the district and village level and provide opportunities for information sharing and collaboration measures.

5.2 Public disclosure

97. ESIA shall be prepared for the proposed emergency works under Moinbori. The document shall be disclosed in the official website of both FREMAA & WRD. The Assamese translation of the executive summary of ESIA shall also be disclosed. Copy of the document shall be available at

the office of the district commissioner and the divisional office of the Water Resource for the reference of the local people.

6 Potential Impacts and Mitigation Measures: Environmental and Social

6.1 E&S Risks and Impacts Related to ESS 1

Control of Riverbank Erosion and improved Flood Protection:

98. The continuous erosion of the riverbank in the Moinbori area along the right banks of the Beki River is not only leading to the depletion of land but also inflicting substantial damages on densely populated villages. This erosion is causing losses in terms of, residential and other structures, crops, public properties, and cultivation fields in the affected area. The Anti erosion works proposed under Moinbori subproject will help avoid the losses described above and will result in savings of about 116 hectares of land annually, which otherwise will likely take place caused by riverbank erosion if no protective measures are undertaken. about 8, 000 people benefit from the sub-project works..

Impact on disadvantaged and vulnerable persons:

99. Under this project, a vulnerable person has been defined that will include minorities, families/households headed by women/females, people with disabilities, families living below poverty line (extreme poor), widows and persons above the age of 60 years irrespective of their status of title (ownership).Vulnerable groups would also include those persons who (after the acquisition of land)become small/marginal farmers and also qualify as vulnerable households and/or individuals. As explained in the above paragraph, these vulnerable groups are part of the communities that are exposed to losing their land from bank erosion Hence the proposed subproject activities will equally benefit the vulnerable persons along with other beneficiaries. However, under the Moinbori subproject, vulnerable persons in 62 residential households will be affected due to land acquisition (90 are elderly, and 20 females headed households).

100. *Cumulative Impact Assessment:* As such, cumulative impacts of the project on Valued Ecosystem Components (VECs) are not anticipated. Thus, no cumulative impact assessment is needed for the proposed project under Moinbori.

6.2 E&S Risks and Impacts Related to ESS2

6.2.1 Construction-Stage ESS 2 Related Risks

Project shall comprise the following types of workers:

101. **Direct workers**: Under the AIRBMP – component 2.1 direct workers are already engaged and providing their services at various level within PMU and PIU. No additional direct level workers shall be contracted for this sub- project.

102. Contracted workers: All the work force deployed by the Contractors will be deemed to be contracted workers for this subproject activities. The Contractor(s) might further engage some subcontractors. All work forces of all such subcontractors will be also deemed to be contracted workers. In total, it is estimated that 210 workers for Moinbori subprojects, both skilled and unskilled, will be required throughout the construction period of three months. Out of which, about 40will be outside workers (outside the subproject area from the same district or adjoining district or outside the state), and 170 labours from nearby villages, mostly un-skilled or semi-skilled labour. About 5% of the local workers are expected to be female. Influx of migrant labour from other district for construction works is likely to continue in this project resulting in potential social conflicts, gender-based violence (GBV) etc.

103. Primary supplier workers: There will be primary suppliers who will provide goods and materials such as the construction material outsourced through contractor(s). Such workers will support the project at different stages. The Labour Management Procedures has the details of all the workers.

Occupational Health and Safety Risks during Construction

104. Some of the Occupational Health and Safety risks which are likely to arise during the construction phase are typical to many large construction sites, which include: exposure to physical hazards from working on water, trip and fall hazards; exposure to emission, dust, and noise.

Mitigation

105. The following mitigation measures will be implemented:

- The Contractor will be required to prepare and implement an occupational health and safety (OHS) plan. These plans will be prepared in compliance with the World Bank Group's EHSGs and national regulations. The Plan shall be reviewed and updated if there are any changes in the construction methodologies.
- OHS Plan should contain general guidance for all identified hazards under each work activity, and they should be presented in three discrete headings, (a) Contractor's Standards on the identified hazard management, (b) Expected Site-specific OHS hazard and risks during construction, and (c) Control and Preventive Measures proposed by the Contractor. The World Bank, South Asia Regions (SAR) has issued a Health and Safety Framework that would guide PIUs and contractors to assess risks and hazards and prepare OHS Management Plans[16].
- Conduct a 'job hazard analysis' at the new construction site to identify potential hazards that may arise from the proposed works or working conditions for the project workers and implement necessary control measures. The job hazard analysis should be part of the Contractor's method statements, which will be reviewed and approved by the PIU, PMU and E & S specialist of PMTC. The E & S specialist of PIU, PMU and PMTC will also visit the construction sites prior to the start of construction to ensure the control measures are in place.
- Regular site inspections and safety audits by the PIU, PMU & PMTC.
- Regular training program for workers on occupational health safety (monthly training and daily toolbox talks). Special attention will be focused on safety training for workers to prevent and restrict accidents and on the knowledge of how to deal with emergencies.
- Incident investigation and reporting, including a complete record of accidents and near misses, will be maintained.
- In order to protect all project personnel and visitors, the Contractor will provide personal protective equipment (PPE) for workers, such as life jackets, safety boots, helmets, masks, gloves, body harnesses, protective clothing, goggles, etc. The Contractor will also provide training to workers on how to use them and maintain them in a sanitary and reliable condition and replace the damaged ones immediately with the new ones.
- Adequate water supply and mobile toilets, medical and first aid care facilities at the worksites
- Contractors will have dedicated and qualified staff to ensure compliance with the OHS Plan
- Awareness-raising material will be used, including posters, signage, booklets, and others at the worksites.
- A complete record of accidents and near misses will be maintained.

[16] https://documents1.worldbank.org/curated/en/703711517234402168/pdf/123023-REVISED-PUBLIC-World-Bank-One-Health-Framework-2018.pdf

- First aid facilities will be made available at the worksites and in the camps. The contractors will engage qualified first aider(s) and tie up with nearby hospital for medical emergence.

With the above mitigation measures, the residual impacts have been assessed as minimal.

Employment Opportunities in Construction Activities:

106. About 170 un-skilled and 40 skilled workers will be required during construction for about three months. The project offers good opportunities for local residents to apply for employment as unskilled and skilled construction workers. The Contractor will be recommended to employ local workers and technicians to the extent possible. In addition to maintaining good relations with the local communities, maximizing local employment may also be cost-effective since engaging the workforce from other parts of the country could be costlier. All these new opportunities for work for local residents could boost employment and improve the social and economic position of the population for a short time.

Mitigation

107. The Contractor will adopt the following guidelines for engaging the labour:

- Encourage to engage local workers/labourers with the same terms and conditions as outside workers/labourers by following the below mentioned steps.
  - Deploy a community mobiliser responsible for facilitating communication between the contractor's team and locals.
  - Conduct community consultation meetings to understand the needs and aspirations of the local population.
  - Conduct outreach programs to inform the local community about employment opportunities.
  - Clearly communicate the skills required, application processes, and benefits of working on the riverbank protection works.
  - Regularly monitor and assess contractor compliance with equal terms and conditions for local and outside workers.
- Prohibition of child labour by following steps
  - Conduct regular training programs to educate contractor personal about the consequences of engaging child labor.
  - Emphasize the legal, ethical, and social aspects of preventing child labor.
  - Conduct surprise inspections to detect and address any potential violations.
  - Implement a regular monitoring and auditing system to ensure compliance with child labor policies.
  - Report any instances of child labor to the relevant authorities for legal action.
- No engagement of forced and bonded labour by following steps
  - Establish mechanisms for workers to report any instances of coercion or forced labor.
  - Conduct training sessions for workers to educate them about their rights and the illegality of forced and bonded labor.
- Establishment of labour GRM and timely redressal of their complaint
- Provision of a safe and healthy working environment to workers; and
- Obtain Labour licences, BOCW registration, WC policy and all risk policy and renewal on expiry.

6.2.2 O&M-Stage ESS 2 Related Risks

Not applicable

6.3 E & S Risks and Impact related ESS-3

Impacts from Borrow Activities:

108. About 93668.84 cubic meters of fill (sand) material will be required for the filling of geobags. Improper siting and extraction of these borrow materials will have significant impacts on the physical and biological environment of the borrow areas. The river sand will be used for the filling of geobags, the government approved borrows areas for the river sand will be used.

Mitigation Measures

109. The following mitigation measures will be implemented:

- The Contractor shall use the government approved and licensed borrow sites for the procurement of river sand. The river sand will be sourced away from the active river channels and during the low flow season.
- Reuse of excavated material from the construction sites to the extent feasible.
- Although the material is widely available, the borrowing/mining activities will be limited to fewer areas to reduce the area extent affected by borrowing activities. If any mining activities are to be carried out outside the project area, they should not be located in any sensitive areas.

With the above mitigation measures, the residual impacts have been assessed as minimal.

Generation of Construction Hazardous Waste:

110. The construction works may generate some excess materials from construction sites (discarded geobags, damaged porcupine members etc.) and wastes from worker's camps and construction yards. In addition, very negligible amount of hazardous waste may be generated spillage of DG sets, used oil of DG set, used filter of DG site etc.

Mitigation

111. The following mitigation measures will be implemented:

- Before commencing the construction activities, the Contractor will be required to prepare a Waste Management Plans C&D waste, hazardous waste etc.). A written record will be kept with type, amount, transportation, and final disposal site of waste.
- Tie up with authorized recycler for safe collection and safe disposal of Used oil & used filer of DG set, contaminated soil from spillage fuel.
- The Contractor will return the empty containers to the suppliers.
- Diesel Storage sheds to be installed 100 meters away from any water sources.
- Precast porcupine shall be procured from authorised/ licenced vendor.
- Geo bag shall be procured from authorised manufacturer complying the Environment compliance.

With the above mitigation measures, the residual impacts have been assessed as minimal.

Generation of Solid Waste:

112. Solid waste will be generated from the construction camps and offices, which includes food waste, paper and plastic, and garbage. About 40 workers live in the construction camp, and the average solid waste generation per worker is 0.25kg per day. Thus, the total quantity of waste generated from the camps will be 10 kg per day. Most of these wastes will be food waste. If these wastes are not properly managed, they may harm the environment and the health of workers and nearby communities.

Mitigation

113. The following mitigation measures will be implemented by the Contractor:

- Before commencing the construction activities, the Contractor will be required to prepare a Waste Management Plan and submit it to the PMU for their review and approval.
- Collection and segregation of solid waste into kitchen waste (organics), paper, glass, and plastic (recyclable) and inert (non-recyclable). Three kinds of waste bins (with different colours) with adequate numbers and capacities will be placed at the campsite (kitchen, offices, and rooms) for the segregation of the waste at the source.
- Organic waste will be treated through onsite composting or through the use of in-vessel composters.
- Procure the services of waste management contractors for the collection and management of recyclable waste.
- Local municipal waste disposal sites will be used for the disposal of inert and garbage. No disposal sites will be established by the Contractor.

With the above mitigation measures, the residual impacts have been assessed as minimal.

Wastewater Discharges from Construction Sites:

114. The wastewater from construction camps with 170 workers (out of about 210 workers, about 40 are expected to be from outside within Assam and will reside at the construction camps) is expected to be about 2000 liters per day.

Mitigation

115. The following mitigation measures will be implemented:

- Construction of wastewater treatment facilities at the campsite (e.g., septic tank and soak pit), site drainage and oil-grease separators will be provided for the drainage of vehicle washing and service area.
- The Contractor will be required to take appropriate measures to avoid and contain any spillage and pollution of the water.

With the above mitigation measures, the residual impacts have been assessed as minimal.

Risk of Soil and Water Pollution from Construction Works:

116. During construction, there is a risk of accidental spills and leakages from fuel and oil tanks, vehicles, machinery that are used in construction areas, yards, worker camps, and storage sites. These leakages will contaminate the soils. The groundwater is located at shallow depths and is easily susceptible to contamination from improper storage and handling of materials, including hazardous materials like fuel, discharges from the construction sites and material storage, lack of proper drainage facilities, spillage of fuels, erosion from material stockpiles, etc.

Mitigation

117. The following mitigation measures will be carried out by the Contractor to minimize soil and water pollution.

- Storage of fuels in contained facilities and take appropriate measures to avoid and contain any spillage.
- Confine the contaminants immediately after such accidental spillage and clean-up of oil spills using spill kits.
- Collect contaminated soils, treat, and dispose of them as a hazardous waste.
- Deposit the excavated material only at the specified site without disturbing the natural drainage.

With the above mitigation measures, the residual impacts have been assessed as minimal.

Air and Noise Pollution from Construction:

118. During construction, air and noise emissions from the construction activities will cause temporary nuisances to the nearby habitants The sensitive receptors susceptible to pollution include Anganwadi Centers, Schools, and places of worship etc. Major sources of air and noise pollution are emissions from construction-related traffic movement, motorboat etc. The construction activities will also generate airborne dust and particulate matter due to vehicular movements. The dust raised from the above activities will have impacts on crops, animals, and public health.

119. The following mitigation measures will be implemented.

- All vehicles, equipment and machinery used for construction will be regularly maintained to ensure that pollution emission levels are below the prescribed CPCB standards.
- Pollution under Control (PUC) certificates will be mandatory for all vehicles/ equipment/ machinery to be used for the project works.
- Water sprinkling would be carried out throughout the construction period to suppress the dust emission.
- Construction activities near the settlements will be limited to daytime only.
- High noise-producing equipment like DG set will be provided with mufflers or acoustic enclosures.
- Traffic guides to be employed by the Contractor near schools.
- A GRM will be put in place to receive complaints from the public on various aspects of environmental issues, including noise pollution. These grievances will be addressed by the Contractor by adopting the necessary measures.

With the above mitigation measures, the residual impacts have been assessed as minimal.

Generation of Spoils:

120. The material (2156 Cu.m.) that is excavated from bank trimming will be reused for filling towards countryside.

Mitigation

121. The Contractor will implement the following mitigation measures to minimize the generation of spoils:

- Reuse of the excavated soils from bank trimming for filling of in low lying area at countryside if suitable.
- Minimize the generation of the spoils by reusing the excavated material wherever feasible, for example, as a filler material under the revetment works and filling of agricultural lands if there is a requirement from the local community.
- Transport and disposal of spoils at the designated disposal sites approved by the Engineer.

With the above mitigation measures, the residual impacts have been assessed as minimal.

Dust from Construction Activities

122. The construction activities, like bank trimming, vehicular movements along the local roads, for material transport will generate dust. The dust raised from the above activities will have impacts on crops, animals, and public health.

Mitigation

123. Following measures will be implemented.

- Dust generation from construction sites will be restricted as much as possible and water sprinkling will be carried out as appropriate, especially at those places where earthmoving excavation will be carried out.
- Frequent sprinkling of water on worksites to control dust emissions. The Contractor must mobilize adequate water sprinkling trucks.
- Project GRM will address complaints from the public on various aspects of environmental issues, including dust pollution.

With the above mitigation measures, the residual impacts have been assessed as minimal.

6.4 E&S Risks and Impacts Related to ESS 4

6.4.1 During the Pre-Construction Phase

Climate Change Risks and Structural Safety

124. The proposed works are subjected to an increased risk of flooding from future climate changes. To address the potential climate change risks, the proposed works are designed based on historical hydrological data and factoring in climate change predictions.

Impact on Public Utilities:

125. The proposed works may impact the existing public utilities such as electric transformer, electric poles, and electric lines located in the vicinity of the proposed work.

Mitigation

126. The WRD will compensate the relevant departments to relocate the utilities prior to the start of the main construction works.

- Electric poles, transformer, and power lines – coordination with Assam Electricity Board for relocation

127. In addition, the following measures will be implemented during the construction.

- Due care is to be taken during the construction phase such that none of the utilities are affected by the project activities. Any damage to the utilities will be rectified immediately. Temporary access routes will be provided to the residences and agricultural fields, where access is blocked.
- As there are utilities (Electric poles and transformers) near the construction sites, these will be cordoned off from the workers, equipment, and vehicles so as not to cause any damage to these utilities.
- Proper barricading and sign boards will be erected around these utilities during construction.
- The scheduling of the construction works will be shared with the line department and communities to ensure uninterrupted services during construction.

Barrier/ Severance Effect:

128. Riverbank revetment work may potentially block access to the river since the slope of the concrete blocks can potentially make it difficult for the people, particularly the fisherman, to cross it.

Mitigations

129. The WRD will implement the following measures:

- Construct stairs and ramps on the bank protection works to access the river for fishers at locations agreed with the community.

6.4.2 During the Construction Phase

Safety Hazards due to Increased Traffic:

130. The construction activities can potentially impact the residents of settlements along the access roads, particularly the movement and safety of school children and elders. Due to the increased use vehicles on the narrow roads in the project area, pedestrians, particularly elderly people, and children, will be more exposed to dangerous situations, leading to traffic accidents. The boats are used for fishing near the work sites at AE works, and their activities might be disturbed by the boats used by the contractors.

Mitigation

- The Contractor will develop and implement a traffic management plan with adequate measures such as proposing traffic diversion measures, alternate routes for local traffic, avoiding school hours, following speed limits, hiring licensed drivers, etc.). The plan will be implemented with the aim of ensuring access to residential areas and preventing unsafe situations, especially near schools, housing areas, construction areas.
- Road signage will be fixed at appropriate locations to reduce safety hazards associated with project-related vehicular traffic, provide adequate signage, barriers, and flag persons for traffic control.
- Project drivers will be trained in defensive driving.

With the above mitigation measures, the residual impacts have been assessed as minimal.

Community Exposure to Natural Disasters, Work Hazards, Communicable Diseases:

131. Communities will be exposed to construction-related hazards due to excavation and heavy vehicular movements. These risks will be more at the construction works located close to the existing settlement (near 6 villages). The area is a flood and earthquake prone zone and the works and communities including labour are exposed to these.

Mitigation

132. The following mitigation measures will be implemented:

- Barricade the work areas with hard fencing to prevent the entry of the community into the construction areas.
- Placing of adequate signboards and flagmen to divert the community away from the construction works.
- Implementation of traffic management plan near the construction sites
- First aid medical facilities will be made available at the worksite, along with condom boxes/ vending machines.
- Campaigns on STIs and communicable diseases (e.g., HIV/AIDs, COVID-19)
- Create awareness among the workers and community members about the floods and earthquakes and follow the guidelines provided by ASDMA.
- Conduct flood and earthquake mock drills among the workers and communities using the manuals developed by ASDMA.

With the above mitigation measures, the residual impacts have been assessed as minimal.

Impacts of Labour Influx

133. It is estimated that about 40non-local workers work on this project. Labor influx may lead to negative impacts on the host community. Pre-existing social issues in the host community can easily be worsened by the influx of labor. The potential risks associated with labour influx are social tension arising between the local community and the construction workers, which may be related

to differences due to competition for local resources, an increase in the rate of crimes and/or perception of insecurity by the local community, increased burden on and competition for public service provision, and the influx of people may bring communicable diseases to the project area, including sexually transmitted diseases (STDs), infectious diseases such as COVID-19, or the incoming workers may be exposed to diseases to which they have low resistance. The presence of workers in local communities can also result in intimate relations as well as sexual exploitation and abuse, and sexual harassment.

Mitigation

134. The following mitigation measures will be implemented:

- The Contractor will prepare a labour influx management plan prior to construction works for approval of PMU.
- Construction camps will be built in the designated areas located away from the local settlements; these camps will comply with IFC/ EBRD Workers Accommodation: Processes and Standards (2009)
- The Contractor will ensure local water usage will not be affected by the project water usage project or compete with the water requirements of the local community.
- This situation will be addressed by an awareness campaign implemented at the beginning of the construction phase. The Contractors will be aware of the possibility and risks of miscommunications between local residents and workers, which could easily lead to conflicts. This will be prevented by raising awareness and implementing a Code of Conduct for the workers.
- The Contractor shall develop a Worker Code of Conduct to govern the behaviour of workers on site, in camps, and in local communities. The Contractor's code of conduct shall cover the program to promote awareness among the construction workers on respecting the local community.
- The awareness campaign will also be aimed at the risk of interaction between the resident population and the construction workforce, including the spreading of sexually transmitted diseases such as HIV/AIDS.
- The Contractor's monthly training program will cover topics related to respectful attitude while interacting with the local community.
- COVID-19 protocol measures, specified in the national and WHO guidelines, will be complied with.

With the above mitigation measures, the residual impacts have been assessed as minimal.

6.4.3 Risk of Gender-Based Violence

135. The interaction between the Project construction labor force and the communities, and especially among the women workers, may lead to Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH). Based on bank’s internal risk classification, this project was considered as Moderate in terms of GBV risk.

Proactive/Preventive Measures

136. Commensurate with this risk level and also to be proactive, the Project has proposed several proactive measures. SEA/SH Action Plan will be designed and implemented and will include the following measures:

- Inclusion of clause on GBV/SEA/SH behaviour obligations in the bid documents
- Advise and sensitize the contractor to minimize external labour.

- Every worker will sign a Code of Conduct
- Awareness training of WRD, contractors, supervision engineers, and service providers staff to sensitize them about SEA, and SH, and their responsibilities to prevent.
- Provide information on the use of GRM to report cases of SEA/SH, Code of Conduct breaches and assist victims of SEA, if signs of SEA are identified/a victim approaches them to complain about SEA.
- Awareness to communities, particularly women, and male and female children to understand the risks of SEA and SH and the roles and responsibilities of parties involved in project implementation on SEA and SH prevention, processes for reporting incidents of project-related SEA/SH, and the corresponding accountability structures.
- Strengthen the Contractors' obligations and capacity to public health and safety risks and ensure contractor supervision capacity to monitor the mitigation of these risks.
- There will be adequate mechanisms in place to protect the local vulnerable population, especially women and minors from risks associated with the influx of workers (harassment, underage sex). Additionally, the Contractor will employ their skilled staff and apply unskilled construction labour from the local population as far as possible to minimize an influx of outsiders into the communities.
- Regular frequent monitoring by PMU and PIU.

6.5 E&S Risks and Impacts Related to ESS 5

Land Acquisition and Resettlement:

137. The proposed construction of AE works will require the acquisition of about 9.87 ha of land, including 1.1 ha of government land and 8.77 ha of private land from 206 households (181 Title Holders and 25 non-Titleholders). Please refer to the RAP for the detailed assessment of impacts related to land acquisition and resettlement.

138. A Resettlement Action Plan (RAP) is prepared to address and mitigate the impacts on the affected households. The objective of the plan is to improve or at least restore the income and livelihood conditions of the people to at least the pre-project level. The households affected will not only receive cash compensation for land and other assets at prevailing rates for full replacement cost, but also additional assistance will be given for relocation and livelihood restoration. Overall, the RAP presents (a) the socio-economic profile of the affected settlements; (b) the type and extent of loss of assets; including land, structures, and trees; (c) principles and legal framework applicable for mitigation of these losses; (d) the entitlement matrix; (e) income and livelihood restoration program; (f) relocation and resettlement budget; (g) the institutional framework for the implementation of the plan, including monitoring and evaluation.

6.6 E&S Risks and Impacts Related to ESS 6

6.6.1 During the Pre-Construction Phase

Impacts on Riverbank and Aquatic Habitat:

139. The footprints of the proposed apron and revetment works will affect about 509 ha of aquatic habitat (over a width of 509 m along 8502m of the river) and 31 ha of riverbank area (over a width of 30 m along 8502m of the bank), which might serve as an aquatic habitat during high flow season. However, this part of the aquatic habitat was once an eroded floodplain habitat. After the construction of the revetment, the geobags create a suitable fish habitat as phytoplankton grows on their surface. Hence the revetment will not result in any net loss of aquatic habitat.

Mitigation

140. The proposed work shall be implemented between January to April 2024. it will also minimize the extent of impacts on the river habitat and would not cause any impact on breeding of fishes which usually happens in June & July.

Loss of Trees:

141. The proposed construction works will require the cutting of trees. About 1354 trees[17] will be cut during the project activities, these species are planted for domestic purposes like betelnut out of total tree to be felled, 55% are betelnut. None of the trees are of threatened status. The impacts of the tree cutting are not significant. Cutting of these trees will not have any impact on the wildlife and bird habitats as they are mainly fruit trees from the agricultural lands. The presence of dense vegetation and forests close to the project sites will provide alternate habitats for the birds disturbed by the tree cutting activities.

Mitigation

142. WRD will implement the following enhancement measures for the tree cutting.

- The loss of vegetation will be compensated through cash compensation to the owners as per the RAP.

With the above compensation and enhancement measures, the residual impacts of vegetation clearance have been assessed as minimal.

Impacts on Wildlife:

143. The proposed anti-erosion works at Monbori are situated approx. 45 km of aerial distance from the boundary of the buffer zone of Manas National Park. The proposed activities will not have any impact on the Manas National Park.

Mitigation

144. Following measures will be implemented to ensure the risk are minimal.

- Record of wildlife sittings by the Contractor near the work sites and any sightings will be informed to the local authority of the Forest Department.
- Measures recommended by the World Bank Paper[18] to address illegal wildlife trade at the project level shall be implemented. These include requirements on contractors to implement induction and awareness programs for staff and workers to highlight the importance of biodiversity and provide the basis for enforcement of policies that prohibit the killing of animals, taking of pets and any engagement in consumption or trade in wildlife products.

6.6.2 During the Construction Phase

Impact on River Habitat due to Instream Construction Activities:

145. The launching of geobags and porcupines in the river has the potential to adversely affect aquatic biota due to the release of turbidity when they hit the bottom of the riverbed. The sand to be used for filling geobags may contain some silt and fine sediments, and they will be released into the water when the geobags are dropped in the river. The placing of concrete blocks for the revetment also generates some sediment in the river. There is also a potential risk of accidental

1. [17] All the 1354 trees to be cut down come under list of tree species exempted from obtaining prior permission for felling and conversion under Schedule-I & II of 'The Assam Trees Outside Forest (Sustainable Management) Rules, 2022 as per official gazette notification published on 2nd January'2023.

[18] *World Bank Paper - Illegal Logging, Fishing, and Wildlife Trade: The Costs and How to Combat it. (https://openknowledge.worldbank.org/handle/10986/32806)*

spillage of fuels from the use of boats for these operations. Borrowing activities for procurement of sand also generate a high sediment load impacting the water quality.

Mitigation

146. The following mitigation measures will be implemented:

- The geobags will be slowly released into the water at the required locations to cause the minimum disturbance to the riverbed rather than dumping from the boats.
- The contractor will use the existing borrow sites operated with government licenses.
- Control of wastewater and sediment releases into the river
- Ensure the boats are in good operating condition, free of leaks, excess oil and lubricants, and grease.
- Keep a spill containment kit readily accessible onsite in the event of a release of a deleterious substance to the environment. Train onsite staff in its use.

With the above mitigation measures, the residual impacts have been assessed as minimal.

Impact on Flora:

147. None of the work sites falls near the forest areas. The impacts on flora during construction include clearing of vegetation for establishing the temporary construction facilities such as worker's camps, material storage sites and other facilities.

Mitigation

148. The following mitigation measures will be implemented:

- The Contractor's code of conduct for workers will include conditions on the protection of flora and fauna and ban on cutting of trees, and a ban on illegal hunting and poaching of wildlife, keeping pets and wildlife trade. Employees found violating would be subject to strict actions, including fines and termination of employment.
- Use of non-wood fuel for cooking and heating.
- Awareness-raising to workers on the protection of flora and fauna

With the above mitigation measures, the residual impacts have been assessed as minimal.

Spread of Invasive Alien Species:

149. Invasive alien species (IAS) present a significant risk to biodiversity and are easily spread by linear projects unintentionally or intentionally through a lack of awareness of the risks. Measures are therefore required to not intentionally introduce any new alien species (not currently established in the country) unless this is carried out in accordance with the existing regulatory framework for such introduction. Species with a high risk of invasive behavior must not be introduced regardless of whether such introductions are permitted. Measures will be implemented to avoid the potential for accidental or unintended introductions, including the transportation of substrates and vectors (such as soil and weed-infested machinery) that may harbour IAS.

Mitigation

- Native tree species will be used for the plantation activities.
- Construction sites will be rehabilitated at the earliest opportunities, and rehabilitation plans will IAS control measures appropriate to the IAS risks prevailing in the project area.
- Construction vehicles will be brought to the site in an 'as-clean-as-new' condition to ensure that invasive plant material and seed-bearing soil are not introduced.
- All vehicles will be cleaned on a regular basis to prevent the unintentional spread of IAS within the project area.

- IAS will be regularly controlled in construction vehicle parking and operational areas.

Impact on Fauna

Impact on Mammals& Birds:

150. The construction workers living in the labour camps will be provided with LPG cylinders for cooking. Wildlife poaching would be possible without proper awareness-raising.

Mitigation

151. Following mitigation measures will be implemented to address the impacts on mammals:

- The dense vegetation will only be cleared once it has been established that any individuals present have fled. The Contractor's environmental specialist will inspect, before and during vegetation clearance or tree felling and major ground-breaking activities, to check for active burrows, snakes, and lesser fauna. Any animals found will be removed and released to appropriate and predetermined safe locations. There should be no burning of natural vegetation. The borrow animals, if found during excavation, shall also be transported to a safe place.
- Removal and relocation of mammals should only be done by qualified wildlife service providers working in accordance with applicable laws.
- Any wildlife encountered during site clearing or subsequent construction activities should be allowed to exit the site on their own, via safe routes. Construction staff should not attempt to capture or handle most kinds of wildlife unless an animal is in imminent peril or is injured and cannot wait for rescue by qualified personnel. Improper handling can result in injuries to both workers and wildlife.
- The Following are useful equipment for wildlife encounters:
  - Work gloves, to reduce the risk of injury from bites or scratches.
  - Push broom for gently redirecting small mammals, reptiles, or amphibians.
  - Clean (uncontaminated) towels or blankets and assorted containers such as plastic sweater boxes, cat carriers, and a large bin or garbage can for capturing and transporting injured or orphaned wildlife (note: small cardboard boxes or unwaxed paper bags are best for small birds).
  - Scratches and bites from animals, whether domestic or wild, can result in serious infections and/or transmit diseases. Immediate medical treatment should be sought for any person injured by an animal.
- Installation of traffic signs alerting speed limit
- Regular visual inspection of wildlife will be conducted by ecologist appointed in the contractors.
- Spill kits should be provided at each construction site where oils and chemicals are used.
- Regular maintenance of construction equipment and vehicle will be undertaken.
- Oils and chemicals should be stored at designated storage with proposed spill/accident prevention and response measures such as the provision of secondary containment, MSDS and spill kit.

152. Following mitigation measures will be implemented to address the impacts on avifauna.

- The construction materials and their by-products should be stored away from watercourses.
- Unnecessary noise generation during the construction work and post-construction should be avoided through regular awareness and traffic no-horn zones.

- Training provision to workers on the potential impacts of their behaviour, including wildlife poaching and habitat degradation/pollution.
- Any animal sightings will be recorded by the Contractor and shared with the local authorities of the Forest Department.

6.7 E&S Risks and Impacts Related to ESS 7

This standard is not relevant.

6.8 E&S Impacts and Risks Related to ESS 8

Impact on Cultural Sites:

153. The baseline has identified that are no historical and archeological monuments near the project sites. But there are, Anganwadi Centre (AWC), places of worship (mosque), Community center Moktab ghar and Gumbaj etc. near the construction sites, located within the footprints of the proposed construction sites. There is one CPR (boundary wall of mosque) going to be affected in Tarakandi village under Moinbori sub project The details of CPR affected along with photographs is provided in RAP. The structure will be demolished and relocated for the greater interest of the flood affected persons to develop anti-erosion works after due consultation with the local people. Few locations have been identified by FREMAA, but suitable locations will be finalized after discussion with local administration and community representatives.

Mitigation

154. The WRD will take the following actions:

- Reconstruct the Common property resources in complete coordination and participation of the affected community and in a culturally and socially acceptable manner.

Impact on Cultural Heritage

155. Though there are no historical and archaeological monuments near the project sites, there are places of worship near the construction sites. One common property resource (CPR) located near the construction site. Construction-related nuisances may impact the visitors of these Mosque/Eidgah. During earthworks, there could be some chance finds.

Mitigations

- Concerned priests of Mosque will be consulted before the construction activities to ensure necessary precautions are taken during the construction phase to minimize the impacts, such as not disturbing their regular activities in and around these sites. This includes providing alternative access during work, adjusting work hours, etc.
- The contractors will use the chance find procedures when encountered with any such chance finds. The procedures are described in the ESMP.

7 Environmental and Social Management Plan (ESMP)

7.1 Overview of Environmental and Social Management Plan

156. Based on the assessment of potential negative impacts referred to in the ESIA, Environmental and Social Management Plans (ESMP) are prepared for the proposed Anti-Erosion Works and presented in Annexure 8. This ESMP is an instrument that details the measures to be taken during the planning, implementation, and operation of a project to eliminate or offset adverse environmental and social impacts or to reduce them to acceptable levels, and the agencies to implement these measures. ESMP is therefore an important tool for ensuring that the management actions arising from Environmental and Social Impact Assessment (ESIA) processes are clearly defined and implemented through all phases of the project life cycle.

7.2 Objectives of ESMP

157. The objective of the ESMP is not only to mitigate the negative impacts on the environment but also ensures that the Socio-Economic standards of the poor and vulnerable groups are improved. This ESMP consists of the set of mitigation, monitoring and institutional measures to be taken up during pre-construction, and construction phases to mitigate adverse environmental and social impacts or to reduce them. Following aspects are taken into consideration while developing the ESMP.

- To a) anticipate and avoid risks and impacts, b) where avoidance is not possible, minimize or reduce risks and impacts to acceptable levels, c) once risks and impacts have been minimized or reduced, mitigate, and d) where significant residual impacts remain, compensate for, or offset them, where technically and financially feasible, the environmental and social risks and impacts.
- To define the parameters and variables to be used to assess the environmental quality in the influence area of the Project.
- To establish mechanisms so that concerned authorities can follow up on the Project environmental variables and implement necessary controls.

158. To support effective implementation of project components and mitigation/ management measures, the required Institutional arrangements and responsibility mechanism are identified in the ESMP. Once the ESMP is approved, it should provide the basis for environmental & social monitoring of activities carried out on the site by the contractor.

7.3 Mitigation Measures and Management Plan

159. The various EMSP measures during pre-construction (planning and design stage) and construction stages are listed in this plan, including the monitoring indicators, monitoring plan. This is annexed to this report as Annexure.

7.4 ESMP to mitigate impacts.

160. The Project has carried out an Environmental and Social Impact Assessment (ESIA) and prepared the Environmental and Social Management Plan (ESMP). The PMU, PIU and Contractors needs to follow and comply with the provisions of this ESIA and ESMP, which are developed to mitigate the risks and impacts identified during impact assessment. The contractor needs to prepare a site-specific Contractor's Environment and Social Management Plan (CESMP) and get the same approved by the concerned PIU. Penalty clauses for not complying with ESMP requirements proposed in the project are presented below:

161. The Contractor shall implement all mitigation/ management measures. Any lapse in implementing the same will attract the penalty as detailed below:

- Any complaints of public, within the scope of the Contractor, formally registered with the PIU communicated to the Contractor, which are not properly addressed within the time period intimated by the PIU shall be treated as a major lapse.
- Non-conformity to any of the mitigation/ management measures stipulated in the ESMP (other than stated above) shall be considered as a minor lapse.
- On observing any such lapses, PIU shall issue a notice to the Contractor, to rectify the same.
- Any minor lapse for which notice was issued and not rectified, first and second reminders shall be given after ten days from the original notice date and first reminder date, respectively. Any minor lapse, which is not rectified, shall be treated as a major lapse from the date of issuing the second reminder.
- If a major lapse is not rectified upon receiving the notice, PIU shall invoke deduction in the subsequent interim payment.

For any non-compliance with regard to major lapses, PIU will initiate action including penalties as per the contract agreement and as per legal provisions.

7.5 Implementation Arrangements

162. Details of institutional arrangement for implementation of the ESMP are given in this Section. This ESIA and ESMP will be approved by PMU. The principal responsibility for implementation of ESMP is the WRD & FREMAA. The Existing institutional arrangements for implementation of ESMP during the project construction are given below:

7.5.1 FREMAA (PMU)

163. The focal point for the E&S risk management of AIRBMP is Flood & River Erosion Management Agency, Assam (FREMAA) headed by Chief Executive Officer (CEO) with extensive experience of Externally Aided Projects (EAP). FREMAA will organize ESMP implementation according to agreement with the World Bank; prepare ESIAs, RAPs and other E&S Risk Management Plans by hiring consultants.

164. FREMAA has an E&S team with an Environmental Specialist, Social Development Specialist and Communication Specialist, along with field supervisors in the field. The E&S team is responsible for the review and approval of documents submitted by the E&S Consultants before sharing them with WB. Field supervisors assist the specialists and E&S Consultants for liaison with government departments, field-surveys, land acquisition etc. The Project Management Unit (PMU) at FREMAA will a) Coordinate with the WB, WRD, ASDMA and other line agencies, , b) With assistance of PMTC Prepare Quarterly Progress Reports and sharing with the World Bank, c) Ensure that all project activities are well-managed and coordinated, d) Coordinate for land acquisition with the Revenue Department and The DCs, and implementation of RAPs, e) Payment of compensation to the project affected households, f) Coordinate for clearances related to safeguards, g) Implement the ESCP, etc.

165. Deputy Chief Executive Officer through the PMU will be responsible for the entire land procurement process, coordination between different agencies responsible for land transfer to the department/ project/ municipal corporations and its compliance with World Bank procedures (ESS5) and measures outlined by RFCTLARR Act, 2013 and other national/ state regulations.

166. The Environment Specialist at PMU is responsible for a) Environmental, Health and Safety Management, b) implementation of ESMP, LMP and ESCP, c) carrying out site assessment and

environment screening d) supervising and monitoring the implementation, and e) reporting and capacity building on EHS aspects, etc.

167. The Social Specialist at PMU is responsible for a) social management, anchoring, supervision, monitoring and reporting, b) compliance with ESMF, SEP, RPF and IPPF and c) implementation supervision and monitoring of all social safeguards plans, ESMP, GAP, SEP, LMP, IPDP, RAP, etc.

7.5.2 WRD (PIU)

168. Externally aided project (EAP) wing of Water Resources Department has its head office at Assam water center Guwahati, Assam headed by the Additional Chief Engineer. A Superintendent Engineer along with his supporting engineering staff, are deputed to EAP to supervise, coordinate, and finalize the technical aspects of the AIRBMP project. The EAP wing has dedicated full time Environment specialist and social development specialist, Environment and Social Specialist are tasked with monitoring of Safeguard at river work sites, regular coordination with contractor team, review of monthly ESHS compliance report and providing feedback, monitoring of work of RAP implementation NGO engaged at sites.

7.5.3 Divisional Office of WRD

169. All the river works under the Moinbori shall come under the Barpeta Water Resource Divisions which are headed by Executive Engineers. Sorbhog sub-division under Barpeta Water Resource Division will be implementing the anti-erosion works under in Moinbori. There is no Environmental or Social staff at divisional or sub-divisional offices.

7.5.4 Pollution Control Board Assam (PCBA)

170. The contractor shall obtain the required consent, /clearance,/permission from the PCBA. PCBA official shall inspect the locations from time to time to ensure compliance of act and provision as per the national and state legal framework.

7.5.5 Department of Labour Welfare

171. The role of Department of Labour Welfare is regulatory, to ensure the establishments registered under it obtain licenses from it and are in compliance with labour laws. It can formulate and issue policies, rules, and standards for OHS consistent with the existing laws. As such, it can occasionally conduct monitoring and audit of workplaces, construction sites and offices of contractors and project management. It can also provide an expert review of the occupational and community health and safety aspects of the ESMP if required.

7.5.6 District Commissioner (DC) Office

172. The respective DC Office (Barpeta district) will regulate quarries, soil and water conservation activities that support river works and minimize likely adverse impacts on the water resource management. District level stakeholder workshop of the ESIA shall be conducted with support and assistance from DC office and based on it endorse the project. DC office has also conducted all the procedures related to land acquisition for the AIRBMP. DC also conducts the meeting for DLAC (District Land Acquisition Committee) to acquire land for the project. The concerned Additional District Commissioner (ADC) for land acquisition or/and revenue deputed by the DC to conduct the ***Zirath*** survey through concerned Revenue Circle Offices along with all the line departments including WRD, PWD, forest, fishery, agriculture etc. to assess details of PAPs (Project Affected Persons).

173. The measurement and valuation of different structures like private houses, buildings etc. will need to be done by DLLPC committee comprising of concerned executive engineer of WRD, Circle Officer of revenue department and other line department officials through approved government valuators. The Standard Schedule of Rates (PWD) of GoA without depreciation would be the basis for valuation of the structures to be displaced or affected due to proposed anti erosion works. The CPRs will either be renovated or shifted to a new location and the community's decisions would be the basis for renovating and/or rebuilding such CPRs.

7.5.7 Department of Archaeology

174. It regulates all archaeological activities in the country as per the provision of the Ancient Monuments and Archaeological Sites and Remains Act, 1958. The department is also charged with protection, preservation and management of the World Cultural Heritage Sites and maintains an inventory of the cultural heritage sites.

7.5.8 Project Management Technical Consultant (PMTC)

175. Project Management Technical Consultant assist FREMAA and WRD on environmental and social mitigation measures as per ESMP and compliance monitoring of the construction contractor's activities and assist FREMAA to prepare quarterly and other periodic monitoring reports for submission to WB. Environmental and Social Development Specialists of PMTC assist FREMAA to review monthly monitoring report submitted by contractors, identify needed corrective actions and follow-up actions, conduct site inspections to validate monitoring reports and identify unanticipated environmental impacts, compel contractors to take corrective actions within specified timeframe to address non-compliances.

7.5.9 Contractor

176. The Contractor shall be primarily responsible for the implementation and internal monitoring of all environmental and social management measures associated with Project design and construction, develop a Contractor's Environmental and Social Management Plan (CESMP) based on ESMP of the project, which addresses all applicable construction phase issues, and revise it as needed in order to obtain approval from PMU. The Contractor shall have the sole responsibility for all activities on sites under its control for the duration of construction. This includes the activities of all subcontractors, whether employed or contracted directly or indirectly by the Contractor. All these will be incorporated into the contract documents as variation of existing contract agreement of Beki Package – 1, Lot – 2.

177. Accordingly, it shall be the Contractor's responsibility to ensure that all activities are compliant with Project plans, permits, licenses and approval conditions, and any other statutory requirements. Contractor shall deploy dedicated OHS expert to implement the health and safety aspects at Moinbori sub projects, Environmental and Social Expert, engaged in Beki Package -, Lot – 2 contract will be responsible to monitor the E&S aspects at site in compliance to WB ESF standards. The contractor submits monthly reports to PIU (WRD) on the status of ESMP implementation, implement corrective actions as instructed by FREMAA, PMTC and WRD.

178. The key responsibilities of the Contractor's Environmental Expert and Social Expert include a) Orientation and training of the contractor's staff on environmental and social management, b) Leading the implementation of ESMP, c) Be regularly on sub-project sites to implement the ESMP during sub-project implementation, d) Providing guidance and inputs to the contractor's working teams on environment and social management aspects, e) Reporting to PIUs on environmental and social aspects as specified in the ESMF, f) Coordinating with PIUs, PMTC, concerned Department, Contractors and other consultants on Environmental and Social matters

7.6 Budget for ESMP Implementation

179. A lump sum budget is provided for the implementation of the ESMP, which is estimated Rs 11,08,800 (This amount will be entered in the Bill of Quantity of contract document. The budget source is project funds, and shall be approved by PMU and PIU, WRD.

I. Annexure 1. Environmental and Social Management Plan (ESMP) of Anti-Erosion Works

Project Activity	Impacts	Mitigation Measures	Cost of Mitigation (INR)	Parameters to be measured	Methods of Measurement	Performance indicator	Sampling Location	Frequency of monitoring	Responsibility		Cost of monitoring (INR)
									Implementation	Supervision	
Pre-construction											
ESS – 3 Related											
Site clearing and Vegetation clearance	▪ Loss of vegetation, removal of trees and shrubs and habitat destruction	▪ Protect all vegetation not required to be removed against damage. ▪ Restrict removal of vegetation and trees to the area of need only Prevent damage to critical ecosystems and habitats. ▪ Undertake quick re vegetation of exposed soils with indigenous plant species once construction is completed. ▪ Prevent colonization by invasive species	No additional costs	Evidence of re-vegetation No disruption of vegetation outside project area	Clearly define the project areas Visual assessment	Visual observation by E & S team and Biodiversity survey	Project areas, site camps, store	During construction	Contractor	PIU WRD	--
ESS – 4 Related											
Barriers to accessing the river	▪ Loss of access to the river for fishers	▪ Consultation with community to explore the requirement of access to river at river protection site. ▪ Suitable arrangement for access to river shall be provided at mutually agreed locations as per provision of contract	Provision in Civil work	Number of accesses required for fisher community to be planned in consultation with local community	Public consultation and number of Grievances received	Number of ramps / accesses to river provided to fisher community	Project area	During Construction	Contractor	PIU - WRD	
Impacts on Public Utility (water, electricity, etc.)	▪ Damages to utilities and disruption in utility services to the public.	▪ Temporary access routes will be provided to the residences and agricultural fields, where access is blocked. ▪ Proper barricading and sign boards will be erected around public utilities during construction.	Separate provision for utility shifting by line department	Presence of cut wires/cables	Inspection of public utilities along the project corridor	▪ Detailed works planning/ construction schedule document Public utilities like, electric poles	Project sites	During Construction and post completion of work	Contractor	PIU - WRD	

Project Activity	Impacts	Mitigation Measures	Cost of Mitigation (INR)	Parameters to be measured	Methods of Measurement	Performance indicator	Sampling Location	Frequency of monitoring	Responsibility		Cost of monitoring (INR)
									Implementation	Supervision	
		▪ The scheduling of the construction works will be shared with the electricity department, and communities to ensure uninterrupted services during construction.				underground pipelines, wires etc. were found to be intact without any damage					
Construction stage											
ESS – 2 Related											
Safety Measures During Construction	▪ Unsafe work practice at work site may lead to injury of workers	▪ All measures outlined in the Contract agreement and ESMP shall be implemented to ensure no accident during construction.	100,00.00	First aid awareness reports Statistics of social and health awareness program Number of PPEs procured. and distributed to workers	Assessment of first aid & HSE knowledge Routine unannounced inspection of PPE,	▪ Number of health checkup camps organized. ▪ first aid kit records. ▪ Accident register	Work sites	During construction	Contractor	PIU - WRD	
	▪ Electrical risk / Fires safety	▪ Fire risk assessment/fire safety training shall be conducted for all staff. ▪ Adequate precautions will be taken to prevent danger from electrical equipment. ▪ No material in any of the sites will be stacked or placed as to cause danger or inconvenience to any person or the public. ▪ All necessary fencing and lights will be provided to protect the public.	No additional cost required	NoC for fire safety Number of Fire extinguisher installed.	Number of mock drills organized	▪ Emergency response plan	Workers camps.	During Construction	Contractor	PIU - WRD	
	▪ Accidents or injuries to workers due to	▪ Necessary steps shall be taken to prevent accidents, injury, and	Awareness cost	No. of	Level of	▪ Number of visible	Proposed Anti Erosion work	During Construction	Contractor	PIU - WRD	

Project Activity	Impacts	Mitigation Measures	Cost of Mitigation (INR)	Parameters to be measured	Methods of Measurement	Performance indicator	Sampling Location	Frequency of monitoring	Responsibility		Cost of monitoring (INR)
									Implementation	Supervision	
	unsafe practice at work site	disease. ▪ Appropriate treatment shall be provided to those suffering from occupational injuries/ diseases. ▪ Reporting to PIU / PMU ▪ Ensuring insurance facilities for labour. ▪ All measures outlined in the ESMP, and contract agreement shall be implemented to achieve zero accident rates. ▪ Awareness and training camp on OHS and health checkup camp shall be organized among the labour	included in A – 1	accidents/ incidents Record of safety meetings held.	Awareness among workers and community. Uses of PPEs ate work sites.	warning signs	site / worker camp				
Operation of Vehicles , Equipment, and machinery	▪ Accidents and injuries to workers and risk to community health and safety	▪ Pollution under control (PUC) test shall be conducted on regular basis and PUC certificate shall be submitted to PIU. ▪ Ensure regular maintenance of vehicles, boats to avoid leaks of oil.	No additional cost required	SPM, Soil monitoring Records of respiratory diseases at site	Weekly inspection of maintenance records	Test result of Air / Soil Quality around project sites ▪	Proposed work sites.	During construction	Contractor	PIU - WRD	10000
Labor influx from employment on project	▪ Risk of social conflict ▪ Threat to community culture, safety, and security due to presence of workers	▪ Local community members including women shall be ensured to have the priority opportunity for employment as skilled and semi-skilled workers. ▪ Engagement of local labor shall be encouraged by limiting the number of migrant	100,000.00	Complaints lodged, suggestion box, GRM process. Incident reported. Presence of security personnel	Reporting of social conflict Visual observation and interviews Eye-Witness Reports of incidents	GRM Records Rates of crimes reported. Enlightenment campaign/ health education statistics.	Project area	During Construction	Contractor	PIU - WRD	

Project Activity	Impacts	Mitigation Measures	Cost of Mitigation (INR)	Parameters to be measured	Methods of Measurement	Performance indicator	Sampling Location	Frequency of monitoring	Responsibility		Cost of monitoring (INR)
									Implementation	Supervision	
		labors. ▪ Promote equal opportunities for employment for all (both male & female) ▪ Develop an induction program including a code of conduct for all workers. ▪ Provide cultural sensitization training to improve awareness of workers to local cultures, traditions, and lifestyles. ▪ Prohibit child and forced labour. ▪ Employment process to include procedures for engagement where ID showing verified date of birth are mandatory. ▪ Establishment of GRM for redressal of GBV grievances ▪ Engagement of competent security personnel at work site.		Recruitment records Camp facilities	Inspection of construction Sites/ camps	Incident reports records of cases of abuse in the workforce, etc. Availability of services in workers camp for recreation etc.					
	▪ GBV-SEAH Risks	▪ Code of conduct for all staff and workers ▪ Sensitization of workers on the content of code of conduct ▪ Training on GBV for all staff and workers engaged. ▪ Site specific gender focal person ▪ GBV GRM logbook ▪ Emergency contact	A – 1 200,000.00	Complaint or incidents recorded on GBV/SEA	▪ Ensure Compliance and Signing of the GBV CoC ▪ Ensure Defaulters are punished severely according to laws preventing rape, sexual	▪ GRM records ▪ Rape/sexual exploitation, reports ▪ GBV Code of Conduct compliance Percentage of health care facilities following national and international guidelines on	Workers camps/ nearby community / project area	During Construction	Contractor	PIU - WRD	

Project Activity	Impacts	Mitigation Measures	Cost of Mitigation (INR)	Parameters to be measured	Methods of Measurement	Performance indicator	Sampling Location	Frequency of monitoring	Responsibility		Cost of monitoring (INR)
									Implementation	Supervision	
		numbers (Hospitals and legal aid council) ▪ Gender sensitive toilets and changing rooms at work sites. ▪ Sensitization of community on GBV ▪ Install signages / post to create awareness against GBV			abuse etc.	clinical care for GBV/SEA victims/ survivors					
ESS – 3 Related											
Air											
Excavation and riverbank trimming/ Vehicle movement	▪ Dust Generation ▪ Vehicular emission ▪ Deterioration in Air quality	▪ Use tarpaulins to cover earth material when transported by dumpers; and fit all heavy equipment and machinery with air pollution control devices, which are operating correctly. ▪ Regular water sprinkling at construction sites and access roads. ▪ Enforced appropriate speed limit for vehicles engaged in construction activities. ▪ Ensure that the air quality levels are constantly monitored.	B 1 100,000.00	SPM, SO2, CO, NOX	NAAQ standard Weekly inspection of / vehicle maintenance records	Pre- mobilized Fitness certificate of vehicles	Project sites, vehicle, and transportation route	During Construction.	Contractor	PIU - WRD	10,000.00

Project Activity	Impacts	Mitigation Measures	Cost of Mitigation (INR)	Parameters to be measured	Methods of Measurement	Performance indicator	Sampling Location	Frequency of monitoring	Responsibility		Cost of monitoring (INR)
									Implementation	Supervision	
River sand mining	▪ Impacts on Borrow Areas ▪ Adverse impact to river channel flow due to improper mining of sand from riverbed	▪ Mining of sand shall be done only with approval of WRD engineers after obtaining NoC from Forest department. ▪ Sand excavation activity shall not alter the flow of river stream. ▪ Sand mining should only be allowed during the dry season. ▪ The depth of mining in Riverbed shall not exceed one meter or water level whichever is less. ▪ In the riverbed, only manual mining shall be allowed	No additional cost for mitigation Cost for Obtaining Permits / NoC – 100,000.00	Uninterrupted flow of river channel, where sand borrowed.	Inspection and Visual observation	Compliance of NOC condition for sand mining	Riverbed	During the mining of sand	Contractor	PIU WRD	--
Supply of material for riverbank protection works	▪ Sourcing of material from unauthorized sources	▪ Procurement of construction material like Geo bags, threads etc. from approved / authorized vendors / manufacturers ▪ Procurement of pre cost porcupine from authorized / licensed supplier	Included in civil work, no additional cost for mitigation	Copy of licensed / permits for manufacturing and suppling, ISO certification etc.	Review of supporting documents submitted by vendor	Licensed document of vendor	Contractor's office	At the time of supply of material	Contractor	PIU WRD	--
Water											
Water requirement for project	▪ Over extraction or exploitation of ground water will	▪ No water required for construction activities; river water shall be used	No Additional cost	Kitchen and dining area Labor Camp area	Inspection and visual inspection	Availability of water at workers camp	Project site, and labour camps	During construction	Contractor	PIU - WRD	--

Project Activity	Impacts	Mitigation Measures	Cost of Mitigation (INR)	Parameters to be measured	Methods of Measurement	Performance indicator	Sampling Location	Frequency of monitoring	Responsibility		Cost of monitoring (INR)
									Implementation	Supervision	
	lead to water scarcity	for sprinkling. ▪ Optimum use of water shall be ensured. ▪ Wastage of water by labour shall be discouraged. ▪ Packaged water/filter water will be used for domestic uses at workers camp									
Discharge of wastewater form Worker's camp	▪ Contamination of surface / ground water	▪ Labour camps shall be located away from water bodies. ▪ Adequate sanitation and waste management facility shall be provided in the construction camp. ▪ The Diesel/fuel storage area shall be kept away from the waterbodies to prevent any wash away into water bodies and appropriate measures to be taken to prevent infiltration into the groundwater. ▪ Construction work close to water bodies will be avoided during the rainy season. ▪ Regular water quality testing and monitoring during construction activities shall be carried out	100,000.00	Periodic test of water quality as per the CPCB norms and IS 10500 (2012) (surface & ground water)	Waste Management Plan Site drainage plan	Permissible limit of surface water quality	River channels / workers camp area	During construction	Contractor	PIU - WRD	30000 for Ground & surface water monitoring
	▪ Waste	▪ Collection and	C - 1		▪ Visual				Contractor	PIU - WRD	

Project Activity	Impacts	Mitigation Measures	Cost of Mitigation (INR)	Parameters to be measured	Methods of Measurement	Performance indicator	Sampling Location	Frequency of monitoring	Responsibility		Cost of monitoring (INR)
									Implementation	Supervision	
Use of Workers Camp	Management	segregation of solid waste into kitchen waste (organics), paper, glass, and plastic (recyclable) and inert (non-recyclable). Three kinds of waste bins (with different colors) with adequate numbers and capacities will be placed at the campsite (kitchen, offices, and rooms) to segregate the waste at the source. ▪ Organic waste will be treated through onsite composting or using in-vessel composters. ▪ Procure the services of waste management contractors for collecting and managing recyclable waste. ▪ Local municipal waste disposal sites will be used to dispose of inert and garbage. ▪ No disposal sites will be established by the Contractor.	200,000.00	Waste, odors, general aesthetics etc	observation of surroundings Ensure waste management plan is implemented	Proper segregation of wet & dry waste Compositing of wet waste & recycling of dry waste by tie up with Kabariwala / Local bodies. Clean environment	At worker's camps and work sites	Throughout the project duration			
	▪ Sanitation	▪ Provide gender-sensitive temporary Sanitary Facilities along project site to prevent open defecation and pollution of water bodies. ▪ Inspect facilities provided such as Bio-toilets, Septic tank, disinfectant/ hand sanitizer etc.)	Cost included in C – 1	Water, soil	Water and soil quality assessment	Adequate Number of sanitary facilities and toilets	Worker's camp, project sites	Weekly	Contractor	PIU	

Project Activity	Impacts	Mitigation Measures	Cost of Mitigation (INR)	Parameters to be measured	Methods of Measurement	Performance indicator	Sampling Location	Frequency of monitoring	Responsibility		Cost of monitoring (INR)
									Implementation	Supervision	
		▪ Ensure facility provided align with the expected number of workers									
Noise											
Noise from Vehicles, boats, Plants and Equipment	▪ Noise from Construction vehicles and equipment will lead to noise pollution and cause health and safety issues	▪ Construction operations should be undertaken primarily during daytime, i.e., 6:00am - 6:00pm, to minimize the noise impact. ▪ Construction activities near habitation areas shall be prohibited between 9 p.m. to 6 a.m. ▪ Selection and use of vehicles/equipment with lower sound power levels shall be done. ▪ The equipment used in construction shall strictly. conform to the MoEF&CC/ CPCB noise standards and shall have the latest noise suppression mountings. ▪ Provide and enforce the usage of hearing protection devices (ear plugs/muffs) for workers exposed to high noise levels. ▪ Install appropriate safety signage and/or use signalers at strategic locations to avoid occurrence of any untoward incident. ▪ Routine Noise monitoring with Noise meter instrument shall be done.	No Additional cost, signages cost included in A – 1	Ambient noise level standards Fitness certificates of equipment and vehicles Use of appropriate PPE	Noise monitoring at construction site near the sensitive receptors	Noise level at sensitive receptors not to exceed the permissible standard. Weekly at Construction site and nearby communities	Project sites, excavation sites, and transportation route,	Throughout construction	Contractor	PIU - WRD	6000.00

Project Activity	Impacts	Mitigation Measures	Cost of Mitigation (INR)	Parameters to be measured	Methods of Measurement	Performance indicator	Sampling Location	Frequency of monitoring	Responsibility		Cost of monitoring (INR)
									Implementation	Supervision	
ESS – 6											
Loss of Trees / Felling of trees[19]	▪ Cutting trees can lead to loss of biodiversity	▪ Loss of commercial trees due to erosion and project activities shall be compensated as per the eligibility of compensation provision in the RAP.	Included in RAP budget	Monitor GRM records. RAP Implementation report	Ensure implementation of RAP	GRM records RAP Implementation report	Project areas,	During construction	RAP NGO / PIU	PMU	--
Loss of trees and Plantation works	▪ Adverse impacts on biodiversity, including loss of biodiversity	▪ Clearing and uprooting shall be avoided beyond that which is directly required for construction activities. ▪ Wherever possible, avoid the removal of existing mature trees, which form important visual focal points. ▪ Non-wood fuel for cooking and heating shall be done.	No additional cost required	Clearly defined boundaries of protected areas Evidence of re-vegetation	Visual observation; and Biodiversity survey	Available number and diversity of plant species within baseline conditions Site restoration after construction	Proposed Anti Erosion work site / worker camp	During project execution & post construction	Contractor	PIU - WRD	
Fauna	▪ Construction activities and workers may cause harm to fauna.	▪ Any animal sightings will be recorded by the Contractor. and shared with the official of Forest department. ▪ Training to the workers on the potential impacts of their behavior, including wildlife poaching and habitat. Degradation/pollution ▪ All the workers will need to be oriented. so as not to cause any harm to the fauna, and handout on wildlife encounters SOP shall be distributed. ▪ One time fauna survey	No additional cost, awareness cost included in A - 1	Code of conduct signed by all workers for protection of wildlife.	Record of animal sighting if any Training imparted to workers.	Signages / hoarding placed for conservation of wildlife.	Project area / workers camp	During construction	Contractor	PIU - WRD	

[19] All the 1354 trees to be cut down come under list of tree species exempted from obtaining prior permission for felling and conversion under Schedule-I & II of 'The Assam Trees Outside Forest (Sustainable Management) Rules, 2022 as per official gazette notification published on 2nd January'2023

Project Activity	Impacts	Mitigation Measures	Cost of Mitigation (INR)	Parameters to be measured	Methods of Measurement	Performance indicator	Sampling Location	Frequency of monitoring	Responsibility		Cost of monitoring (INR)
									Implementation	Supervision	
		shall be conducted during the construction stage.									
Traffic Management	▪ Unplanned and unmanaged traffic diversion and detours can result in public nuisance.	▪ Project drivers will be trained in defensive driving. ▪ Ensure that all construction vehicles observe speed limits on the construction sites and on public roads. ▪ Necessary signage and barricading will be provided for the safety of road users.	100,000.00	Road signage's, dissemination of information, driving permit and statistics, Presence, and use of covering materials	▪ Monitor Traffic Situation reports, Monitor Accident records, IVMS records etc	Journey management record; Number &adequacy of signs/ speed breakers Federal traffic regulation, Presence of a TMP	Project site and along transport route	Weekly	Contractor	PIU	
	▪ Health and safety (Hygiene)	▪ All measures outlined in the ESMP shall be implemented to ensure that health and safety of the workers, visitors, and neighboring communities.		Health, HIV/AIDs, STDs etc.	▪ HIV/AIDs, STD tests	▪ Records of Engagement of an NGO Health record	Worker's Camps and worksites	During construction	Contractor	PIU - WRD	
Risk caused by Force' Majure	▪ Sudden instruction of work	▪ Reasonable precaution will be taken to prevent danger of the workers and the public from flooding, fire, etc. ▪ First aid facility shall be available with trained first aid personal. ▪ Tie up with hospital in case of medical emergency.		Tie-up with Hospital Number of first aid box available at site Number of trained first Aiders	Usage of signage and demarcations Signage's placed of emergency contracts.	Emergency preparedness plan	Project sites	During Construction	Contractor	PIU - WRD	
ESS – 8 Related											
Cultural Heritage	▪ Potential impact on cultural heritage sites/structures	▪ Concerned priest of Masjid will be consulted before the construction activities to ensure the necessary precautions ate taken during the construction phase to minimize the impact	Included in RAP	Compensation paid against relocation of CPR	Consultation with concerned priest	Compensation paid	CPR site	Prior / post relocation	RAP NGO	PIU - WRD	

Project Activity	Impacts	Mitigation Measures	Cost of Mitigation (INR)	Parameters to be measured	Methods of Measurement	Performance indicator	Sampling Location	Frequency of monitoring	Responsibility		Cost of monitoring (INR)
									Implementation	Supervision	
Chance finds	▪ There is a possibility of cultural relics, chance finds at the construction sites. Without proper plan these artifacts may be misused by contractors/ workers	▪ The contractor shall take reasonable precautions to prevent his workers or any other persons from removing and damaging any such article or things. He shall immediately upon discovery thereof and before removal acquaint the Engineer – in charge of such discovery and carryout the Engineer's instruction for dealing with same, waiting which all work shall be stopped. The Engineer shall seek direction from ASI before instructing the contractor to commence the work	No additional cost required	Any record of chance finds, awareness and training conducted	Site inspection	Record of such incidences if any	Project site	During Construction	Contractor	PIU - WRD	
Total Mitigation cost			**100,00,00.00**				**Total monitoring cost**				**56000**
Miscellaneous, Provisional sum- and contingency cost @5% of total			**50,000**				Miscellaneous, Provisional sum- and contingency cost @5% of total				**2800**
Grand Total (Mitigation & Monitoring)			**11,08,800**								

II. Annexure 2. Community consultation and Focus group discussions (FGDs)

Topics Discussed:

- Information about anti-erosion work
- Risk of river erosion and status of existing erosion
- Preparedness against rapid erosion and assistance given by the District Administration
- Seeking cooperation during the time of execution of work
- Prior consent for land due to emergency of work execution
- Eligibility and entitlement for compensation and procedure of disbursing compensation to the affected
- Status of local institutions within the village
- Status of TH and NTH
- Primary and secondary source of livelihood for the people

Details of consultations/FGDs conducted at different project targeted villages under Moinbori area

Sl. No.	Date	Place of Consultation	M/F= No. of Participants	Issues Raised	Responses against the Issues Raised
1.	**09/11/23**	Chikni Village, Jaurimari	**24/15=39**	**Issues and Concern Discussed:** 1. Community's responses about the emergency situation and their strategy to cope up with the loss of land, homes, and homestead on the face of the erosion were taken during the conversation. 2. Information on the erosion control and stabilization measures proposed to be adopted there was also disseminated. 3. The discussion was lead to identify the future possible hazards and the corresponding preventive measures. 4. Tried to understand the livelihood status of the Community. 5. People wanted to know about the proposed works in details. 6. They wanted to know whether migrant laborers will come to their village or not 7. People are ready to shift from the project site evacuating the required land immediately. 8. People are ready to wait for the compensation after giving consent to start the civil works. At the same time they also want to participate in the project works.	1. People were told that Anti Erosion works will be undertaken in the location marked using latest available material and technology. 2. People were informed that first preference will be given to laborers from the village only. However, if there is shortage or unwillingness on part of locals, then migrant laborers (temporary) would be engaged for the work. 3. People are informed that individual consent will be taken from each of the HHs before execution of the civil works. However, compensation will be provided to them against their land and assets. 4. Grievance Redressal mechanism is already established. Contract numbers will be provided to people soon. People can submit their petition for redressal in case of any grievance on receiving compensation and related issues.
2	**21/11/23**	Poschim (West)Moinbori	**45 /12=57**	**Issues and Concern Discussed:**	1. People are informed that the proposed river bank protection works on emergency

				1. The road junction threatened by erosion connects 6 GP s which is crucial for the farmers' movement and transportation of their agricultural produces. Any impact on the road will adversely affect 1 lac people immediately. Hence it is of utmost importance to save the road from erosion. 2. The Anganwadi Centre will be demolished and the temple in the village already got submerged in river water. 3. The Marquis Masjid, the Panchayat Bhawan. the government school (est. 1962) and the market all these amenities are under threat for the persistent erosion. 4. Some of the villagers have experience of multiple displacement in their lives because of river erosion. 5. Some people wanted to know whether they will get any compensation for their lands and assets in future. 6. People wanted to know whether people who do not have patta land are entitled for the benefits or not. 7. People anticipating livelihood loss wanted to know whether they will get any kind of compensation?	basis will protect the villagers from further erosion. 2. It was informed that, WRD is planning for some immediate temporary measures to protect the existing road before the starting of the main emergency works to avoid further threat to the existing road. 3. It was informed that various possible measures shall be taken to protect all the important CPRs under this project. 4. People were clarified that they will get compensation for land and assets, however due to the emergency nature of the works, civil works will be executed first and subsequently compensation will be provided. Individual consent will be taken from the HHs. People agreed on it. 5. It was clarified that non-titleholders will get the benefits except for the cost of land. 6. People who raised concern regarding getting of compensation against livelihood disruption were informed that they will R&R assistance as compensation and also receive livelihood training for restoration of livelihood.
3.	21/11/23	Takakata	20/17=37	**Issues and Concern Discussed:** 1. People wanted that quality of work should be good. 2. People are ready to cooperate as they have already been losing land to the severe erosion.	1. People were informed that the project would be funded by the World Bank and it would be ensured that quality is maintained.

				3. Questions rose like whether Contractor will be engaged from local area or outside?	2. People were informed - within 45 days compensation will be provided to them. Individual consent will be taken from each of the PAPs. 3. All the PAPs were informed to update their land records. 4. It was also informed that NGO would be engaged for assisting them in all works. 5. They were told - qualified and experienced contractor will be engaged for the project.
4	**12/12/23**	Joypur	**29/13=42**	**Issues and Concern Discussed:** 1. People are waiting for some interventions so that their land can be saved. 2. People are ready to move anytime. They assured their cooperation. 3. People are ready to provide land on rent basis to the contractors for the construction camp. 4. People want to get engaged in the project work and provide help if needed. They assured of availability of local labourers for the project. 5. People wanted to know where should they go to get the compensation and assistances.	1. People were informed that civil works would be started very soon. 2. People were told - they will get the compensation within 45 days of signing the consent form. Their land and zirat will be assessed by the revenue officials and estimates will be prepared. 3. It was informed that for compensation they need to go to Deputy Commissioner's office at Barpeta and Circle office at Kalgachia. It was also informed that NGO will be engaged for assisting them in all works.
5	**2/12/23**	**Tarakandi**	**27/12=39**	**Issues and Concern Discussed:** 1.The village was established long back having some ancient connections. 2. People asked whether labourers' camps will be established there and scope of livelihood activities for the local as labour.. 3. Women are active through several SHGs in the village. They are willing to participate in alternate livelihood trainings.	1. People were informed that the most vulnerable locations were selected so that these are protected from immediate erosion. 2. People were informed that labourers' camps will be established near the project sites and there would be possibilities of providing engagement to the local people as labour during project execution.

				4. Queries came about engaging of local youths in the project work. 5. People wanted to know why the entire stretch of the river was not selected for the emergency works.	3. Women were advised to seek livelihood assistance under various government scheme through the field supervisor of FREMAA, Social development Officer of EAP, WRD and the RAP implementing NGO if needed.
6	29/12/23	Sikartari	25/12=37	**Issues and Concern Discussed:** 1. People inquired regarding possibilities of livelihood activities for the local as labour. 2. Women SHGs were interested to participate in skill training programmes 3. People wanted to know why the entire stretch of the river was not selected for the emergency works. 4. Peoples concern was how early would the work get started?	1.People were informed that the most vulnerable locations were selected so that these are protected from immediate erosion. 2. People were informed that there would be possibilities of providing engagement to the local people as labour during project execution. 3. Women were advised to seek livelihood assistance under various government scheme through the field supervisor of FREMAA, Social development Officer of EAP, WRD and the RAP implementing NGO if needed. 4. People present in the consultation were assured that the work will start very recently once the individual prior consent for land is obtained, as the eligible compensation will be paid within 45 days of getting signed consent.