

DRAFT

**ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT REPORT AND ENVIRONMENTAL
AND SOCIAL MANAGEMENT PLAN**

For

**Improvement of Ampati to Purakhasia Road (AP) from 20th to 28th Km for
Meghalaya Logistics and Connectivity Improvement Project (MLCIP) Corridor
funded by the World Bank**

Submitted To



**Meghalaya Infrastructure Development Finance Corporation (MIDFC) Ltd.
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Document Information

This document includes ESIA Report of 08.00 km length of AP Roads in Corridor 8 based on DPR dated 31-08-2025.

Submitted to:

Meghalaya Infrastructure Development Finance Corporation (MIDFC) Ltd.
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ACRONYMS

ASI	: Archaeological Survey of India
BIS	: Bureau of Indian Standards
BMC	: Biodiversity Management Committee
CESMP	: Contractor's Environmental and Social Management Plan
CGWB	: Central Ground Water Board
CoI	: Corridor of Impact
CPR	: Common Property Resources
CTE/CTO	: Consent To Establish/Consent to Operate
CW	: Carriageway
DG	: Diesel Generator
DPR	: Detailed Project Report
E&S	: Environment and Social
EHS	: Environment Health and Safety
EIA	: Environmental Impact Assessment
ESF	: Environmental and Social Framework
ESIA	: Environmental and Social Impact Assessment
ESMP	: Environmental and Social Management Plan
ESMU	: Environment and Social Management Unit
ESMF	: Environmental and Social Management Framework
ESRS	: Environmental and Social Review Summary
ESS	: Environmental and Social Standards
ESZ	: Eco-Sensitive Zone

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FPIC	: Free, Prior, and Informed Consent
GBV	: Gender-Based Violence
GIS	: Geographic Information System
GoM	: Government of Meghalaya
GRM	: Grievance Redress Mechanism
GHADC	: Garo Hills Autonomous District Council
HIV	: Human Immunodeficiency Virus
IBA	: Important Bird Area
IBAT	: Integrated Biodiversity Assessment Tool
IDP	: Internally Displaced Persons
IEC	: Information, Education, and Communication
IFC	: International Finance Corporation
IRC	: Indian Road Congress
ISFR	: India State of Forest Report
IUCN	: The International Union for Conservation of Nature
KBA	: Key Biodiversity Area
LHS	: Left Hand Side
LULC	: Land Use Land Cover
MDF	: Moderately Dense Forest
MDR/ SH	: Major District Roads/State Highways
MoEF&CC	: Ministry of Environment, Forest and Climate Change
MLCIP	: Meghalaya Logistics and Connectivity Improvement Project
MSPCB	: Meghalaya State Pollution Control Board

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MSDMA	:	Meghalaya State Disaster Management Authority
NATMO	:	National Atlas and Thematic Mapping Organization
NBSAP	:	National Biodiversity Strategy and Action Plan
NGO	:	Non-Governmental Organization
NH	:	National Highway
NOC	:	No Objection Certificate
No _x	:	Oxides of Nitrogen
NTFP	:	Non-timber forest product
NABET	:	National Accreditation Board for Education and Training
OF	:	Open Forest
OHS	:	Occupational Health and Safety
OIP	:	Other Interested Parties
PAP	:	Project Affected Person
PBR	:	People's Biodiversity Register
PESO	:	Petroleum and Explosives Safety Organization
PIA	:	Project Influence Area
PID	:	Project Information Document
PM	:	Particulate Matter
POSH	:	Prevention of Sexual Harassment
PPE	:	Personal Protective Equipment
PROW	:	Proposed Right of Way
PUC	:	Pollution Under Control
PWD	:	Public Works Department

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R&R	: Resettlement and Rehabilitation
RAP	: Resettlement Action Plans
RF	: Reserve Forest
RFCTLARR	: Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013
RHS	: Right Hand Side
RoW	: Right of Way
SBB	: State Biodiversity Board
SEA	: Sexual Exploitation and Abuse
SEIAA	: State Environment Impact Assessment Authority
SEP	: Stakeholder Engagement Plan
SH	: Sexual Harassment
SIA	: Social Impact Assessment
SOP	: Standard Operating Procedures
ST	: Scheduled Tribes
SC	: Scheduled Caste
OBC	: Other Backward Caste
GC	: General Caste
TSG	: Technical Support Group
VDF	: Very Dense Forest
WB	: World Bank
WPA, 1972	: Wildlife Protection Act, 1972
WPA, 2022	: Wild Life (Protection) Amendment Act, 2022

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1. INTRODUCTION

1.1 Background

The Meghalaya Logistics and Connectivity Improvement Project (MLCIP), with a total investment of USD 300 million comprising USD 240 million from the World Bank and USD 60 million from the Government of Meghalaya (hereinafter refer to as the state government) aims to: a) enhance connectivity to key growth centers along identified road corridors; b) improved rural and district-level logistics infrastructure and services; c) provide greater market access and reduced average cost/time for select agriculture and horticulture products; and, d) strengthen institutional capacity for efficient, climate-resilient transport and logistics, West and East Meghalaya. The following are the key components of the project:

Table 1.1: Components of MLCIP

Components	Sub-components
Component 1: Climate-Resilient Roads and Road Safety	Sub-component 1.1: Rehabilitating Critical State Roads Sub-component 1.2: Promoting Road Safety Measures Sub-component 1.3: Implementing Policy and Regulatory Reforms
Component 2: Logistics Infrastructure and Services.	Sub-component 2.1: Developing key Logistics Infrastructure and Services for Selected Commodities Sub-component 2.2: Supporting Integrated Policy Reforms
Component 3: Institutional Strengthening and Capacity Building	Sub-component 3.1: Strengthening Road and Logistics Management Capacity in the State Sub-component 3.2: Leveraging and Promoting Private Sector Participation in the sector Sub-component 3.3: Promoting Employment Opportunities for Women and Local Communities
Component 4: Contingent Emergency Response Component (CERC).	

This ESIA, covers one of the critical state roads under Sub-component 1.1: Rehabilitating Critical State Roads which covers: (a) the construction/upgradation of about 600 kms of state roads (state highways, major district roads, feeder roads and bridges); and (b) incorporate climate-resilience and green road technologies in design and construction/upgradation of identified road corridors including improvement of drainage and slope protection works, and resurfacing of damaged road sections, preferably through locally available materials to improve all-weather connectivity between the hinterland and the 'Hashtag' corridors, national highways, and major markets. The selection of roads will be guided by an assessment of connectivity needs to economic and social infrastructure, significant production and consumption centers in the state, local markets, hinterland, and other key interstate and international road/rail/inland water transport networks, and potential social impacts, including the possibility and scale of land requirement. Performance-Based Maintenance Contracts (PBMC) will be introduced to incorporate climate resilience within contractors' specifications, ensuring sustainable maintenance. The planned civil works aim to improve all-weather accessibility, enhance the usage of alternative technologies and locally available materials, and increase resilience to climate change.

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The rehabilitation of the state roads will be carried out in phases. The total of 672.499 km is divided into the East and West regions of 335.049 km and 337.45 km, respectively. In the first phase, a total of 126.27 kilometers (km) will be undertaken in West Meghalaya, followed by the remaining 211.18km in the second and third phases.

Table 1.2: Details of Proposed Road Corridors in East and West Meghalaya under MLCIP

Sl. No.	Name of the Corridors and Proposed Upgradation/ Improvement	Length (Km)	Districts	Start point Coordinate	End Point Coordinate
Phase I					
East Meghalaya					
1.	Upgradation of Dkhiah - Sutnga - Saipung - Pala upto Semmasi Road (Corridor 1)	64 Km	East Jaintia Hills	25° 21.818'N 92° 21.693'E	25° 22.638'N 92° 25.413'E
2.	Upgradation of Weiloi - Mawsynram Road upto Phlangwanbroi (Corridor 8)	27 Km	East Khasi Hills	25° 21.733'N 91° 36.781'E	25° 15.037'N 91° 29.637'E
3.	Upgradation of Umtyngar - Sohra Road upto 8th Km of Mawsmi-Shella (Corridor 3)	42 Km	East Khasi Hills	25° 27.668'N 91° 49.619'E	25° 10.173'N 91° 44.580'E
4.	Upgradation of Umsning – Jagi Road i/c Major bridge (Corridor 10)	39.87 Km	Ri Bhoi	25° 52.710'N 92° 7.267'E	26° 4.494'N 92° 9.971'E
West Meghalaya					
1.	Improvement and Widening of Rongrenggre-Simsanggre-Nengkhra (RSN) Road including Conversion of weak Bridges to Permanent RCC bridges. (Corridor 1)	22.00	East Garo Hill	25°33'14.74"N 90°33'40.28"E	25°29'59.13"N 90°41'24.08"E
2.	Improvement of Rongjeng – Mangsang Adokgre (RMA) road from 23 rd to 44 th Km including construction of a major Bridge at Eldek Akong and Bridge No. 1/6 (Corridor 2)	22.00	East Garo Hill & North Garo Hill	25°38'59.68"N 90°48'18.15"E	25°49'55.69"N 90°58'26.22"E
3.	Upgradation of Rongsai Boijhora Bajengdoba (RBB) Road from single to intermediate lane. (Corridor 3)	18.27	North Garo Hill	25°53'29.62"N 90°31'1.15"E	25°59'55.42"N 90°27'9.35"E

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Sl. No.	Name of the Corridors and Proposed Upgradation/ Improvement	Length (Km)	Districts	Start point Coordinate	End Point Coordinate
4.	Strengthening and Improvement of Songsak- Mendipathar Road (MDR) including re-construction of weak CD Works and Bridges(Corridor 6)	36.00	East Garo Hill & North Garo Hill	25°39'22.25"N 90°36'55.29"E	25°55'15.35"N 90°38'1.22"E
5.	Improvement of Ampati to Purakhasia Road(Corridor 8)	8.00	South West Garo Hill	25°18'39.79"N 90° 0'24.28"E	25°28'21.62"N 89°55'55.49"E
6.	Improvement of Adugre to Purakhasia Road(Corridor 9)	20.00	South West Garo Hill & West Garo Hill	25°26'23.54"N 90°12'30.77"E	25°18'5.03"N 90° 0'20.04"E

Next Phases

East Meghalaya

1.	Upgradation of Lakadong – Mooriap upto Semmasi Road (Corridor 2)	20 Km	East Jaintia Hills and West Jaintia Hills	25° 29.647'N 92° 33.091'E	25° 24.253'N 92° 32.662'E
2.	Conversion Of 17 Weak Bridges Under Pynursla Division To Permanent R.C.C. Bridges (Corridor 4)	--	East Khasi Hills	--	--
3.	Reconstruction of a weak bridge into permanent RCC Bridge on Nongstoin-Maweit Road at 10th Km (Corridor 5)	39 m	West Khasi Hills	--	--
4.	Construction of Umpling Bridge including approaches (Inside Shillong City) (Corridor 6)	80m & 60m	East Khasi Hills	--	--
5.	Upgradation of Weiloi MawkyrwatuptoKeniong including replacement of SPT Bridges into permanent RCC Bridge(Corridor 7)	50 Km	East Khasi Hills and South West Khasi Hills	25° 21.791'N 91° 36.792'E	25° 17.692'N 91° 21.889'E
6.	Upgradation including construction of road from Kongong (NH-06) to Shkentalang (NH-206) passing by the side of Phe and Rynji Falls (Corridor 9)	27 Km	East Jaintia Hills and West Jaintia Hills	--	--
7.	Construction of Umdang-Amarsang-Maheshkola Road (Corridor 11)	65 Km	West Khasi Hills and South West Khasi Hills	25° 33.231'N 90° 57.403'E	25° 11.265'N 90° 58.333'E

West Meghalaya

1.	Improvement of Gasuapara Chokpot Road including construction of bridges (Corridor 7)	19.00	South Garo Hill	25°11'50.07"N 90°20'42.66"E	25°16'34.85"N 90°25'43.08"E
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Sl. No.	Name of the Corridors and Proposed Upgradation/ Improvement	Length (Km)	Districts	Start point Coordinate	End Point Coordinate
2.	Improvement and Upgradation of 12th Mile of TD Road to Chokpot including reconstruction of weak bridges (Corridor 4)	38.40	South Garo Hill	25°14'1.67"N 90°29'2.10"E	25°22'57.30"N 90°18'46.24"E
3.	Strengthening and Improvement of Resu- Dekachang - Anogre via Gabil Road (MDR) including conversion of weak bridges into RCC bridges (Corridor 5)	44.48	East Garo Hill, North Garo Hill & West Garo Hill	25°53'55.73"N 90°36'52.52"E	25°43'11.45"N 90°22'43.20"E
4.	Construction of road from Shallang to Siju including construction of a major Bridge over Simsang River (Corridor 10)	51.00	West Khasi Hill & South Garo Hill	25°31'46.51"N 90°51'41.36"E	25°21'33.75"N 90°39'32.89"E
5.	Construction of Baghmara Gittinggre Road to Chokpot C & RD Block via Mindikgre (Corridor 11)	20.30	South Garo Hill	25°15'18.40"N, 90°33'54.54"E	25°18'36.60"N, 90°26'25.76"E
6.	Construction of Mangsang to Mawshynrut (Riangdo) Road (Corridor 12)	38.00	West Khasi Hill	25°39'58.20"N 90°55'12.41"E	25°38'49.14"N 91° 3'14.02"E

1.2 Utility Details

The project road corridor, classified as a Major District Road (MDR) with a total length of approximately 08 km, is equipped with several essential utility infrastructures. Electric poles, overhead electric lines, and Optical Fiber (OFR) cables run parallel to the road alignment, serving as key associated facilities that support both local communities and regional connectivity. These utilities are critical for ensuring uninterrupted power supply and communication services in the project area and will be duly considered during road improvement and construction activities to avoid any disruption or damage.

A total of 44 electric poles, 1 transformer, and 32 electric line crossings are identified along the AP road corridor for shifting. Of these, 15 poles are on the LHS and 29 on the RHS. A total of 9 OFC pillars are identified for shifting along the AP road corridor, comprising 3 on the LHS and 6 on the RHS. Details of utilities are given in **Table 1.3 & Table 1.4**.

Table 1.3: Utility for Electricals

Chainage		Electric Pole		Transformer		Electric Crossing line
LHS	RHS	LHS	RHS	LHS	RHS	
19+000	20+000	1	1	1	0	4
20+000	21+000	0	0	0	0	0
21+000	22+000	0	0	0	0	0
22+000	23+000	0	0	0	0	6

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23+000	24+000	2	0	0	0	2
24+000	25+000	1	0	0	0	2
25+000	26+000	2	13	0	0	5
26+000	27+000	5	9	0	0	6
27+000	28+039	4	6	0	0	7
Total		15	29	1	0	32

Table 1.4: Utility for OFC

Chainage		OFC PILLAR	
LHS	RHS	LHS	RHS
19+000	20+000	0	0
20+000	21+000	0	0
21+000	22+000	0	0
22+000	23+000	0	0
23+000	24+000	0	0
24+000	25+000	0	0
25+000	26+000	4	0
26+000	27+000	4	0
27+000	28+039	1	0
Total		9	0

1.3 Scope for Conducting the ESIA Study

Accordingly, the scope of ESIA study for various environmental and social attributes was defined. Based on the screening and scoping outcomes, the following set of activities has been carried out for this detailed ESIA study.

- Information on the proposed sub-project components and activities to be gathered from DPR and site for each stage of the project cycle (Design, Pre-construction, Construction, and O&M), including location, project design, processes and materials to be used, expected waste generation, etc.
- Literature review and collection of data relevant to the study area.
- Environmental monitoring and Socio-Economic Survey to establish the baseline environmental and social status of the study area.
- Identification of the probable adverse E&S risks and impacts of the sub-project due to the construction and operation of the proposed improvement works.
- Identification of the stakeholders and various groups/institutions who are either affected or have an interest or a stake in the corridors, with additional emphasis on disadvantaged and vulnerable groups, and to carry out consultations with stakeholders to help elicit their concerns, suggestions, and support.
- Preliminary assessment of potential impacts of climate change and induced cumulative impacts.

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- Preparing an ESMP outlining the measures for improving the environmental quality and social aspects, specifying responsibilities for implementing mitigation measures, budgetary and associated costs, and time schedules of their application in the sub-project cycle.
- Identification of the critical environmental and social attributes required to be monitored after the implementation of the proposed sub-project.

The study commenced with screening and scoping, during which key issues were identified through surveys, stakeholder engagement, and impact analysis. This was followed by an impact assessment using baseline data to evaluate potential environmental and social effects, propose mitigation strategies, and develop management plans. Finally, ongoing public consultation ensured stakeholder feedback shaped the assessment, leading to refined reports, approvals, and continuous monitoring throughout sub-project implementation.

1.4 Approach and Methodology

The methodology adopted for the ESIA complied with the requirements of the World Bank ESF (ESSs), the EIA Notifications of the Ministry of Environment, Forest and Climate Change (MoEF&CC), the Indian Roads Congress (IRC) guidelines, the MoRTH Guidelines, and other national guidelines. The following **Table 1.5** summarizes the approach adopted for conducting the ESIA study.

Table 1.5: Approach and Methodologies

Sl. No.	Stages	Activities Done
1.	Screening and Scoping	Identified key issues through primary and secondary surveys, assessed stakeholders, and analyzed potential impacts considered in the Environmental and Social Impact Assessment, following the Free, Prior, and Informed Consent (FPIC) process to ensure meaningful participation and consent of Indigenous Peoples and affected communities.
2.	Public Consultation for Scoping Report	Identified key issues to understand stakeholder concerns and inform sub-project design and build awareness on the project including the Free, Prior, and Informed Consent (FPIC) process. This involved engaging with Indigenous Peoples and affected communities through meaningful consultations in a transparent and participatory manner. In order to make them aware of the project activities, an attendance sheet was maintained to record the presence of villagers who participated in the consultation meeting including geo tagged photographs as evidence of the same. These were the first round of consultations for FPIC.
3.	Baseline Data Collection	To assess the baseline environment and social conditions, the data has been accessed from authentic and verifiable sources as given in Table 1.2 for collecting the primary data through consultation, field survey, and secondary data.
4.	Impact Assessment	Using baseline data, the AP Project road potential impacts on the environment and local communities were assessed, including direct and indirect effects, as well as short-term and long-term impacts. A targeted assessment was carried as a part of ESIA since the sub-project area falls under a Schedule VI region with the presence of tribal communities. The Second round of FPIC consultations were

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Sl. No.	Stages	Activities Done
		undertaken as part of the impact assessment to ensure meaningful engagement with Indigenous Peoples (IP's) to further discuss the project design, benefits and impacts, and to provide the communities' priorities and inputs to drafting of the mitigation plans and measures. During this consultation, IPs' written consent to proceed with the Project has been recorded through a resolution and countersigned by the participants, with attendance sheets, photos, etc. and attached as Annexure 7.3 .
5.	Mitigation and Management Measures	Based on the impact assessment, measures were proposed to mitigate or minimize adverse environmental and social impacts while enhancing positive outcomes. These included exploring Project road design alternatives to reduce Involuntary resettlement and environmental degradation. These measures have been integrated in the draft Environmental and Social Management Plan, Resettlement Action Plan, Indigenous People's Development Plan, Labor Management Procedures, Stakeholder Engagement Plan and SEA/SH Action Plan, among others.
6.	Draft ESIA Report	A draft report summarizing the findings of the Environmental and Social Impact Assessment (ESIA) has been prepared.
7.	Public Disclosure of ESIA	Public Consultations informed each stage of the ESIA development. In accordance with both GoM and WB requirements, the draft ESIA report and mitigation plans (ESMPs, RAP, IPDP) has been prepared for disclosure and public consultation. Stakeholders, including local communities, NGOs, government agencies, and experts, will be invited to provide feedback and the final report will be revised based on the feedback received. In addition, No Objection Certificates (NOCs) will be obtained from the village-level traditional institutions to ensure community consent and administrative approval before proceeding with the project in the proposed area.
8.	Final ESIA Report	The draft ESIA report and mitigation plans (ESMPs, RAP) will be finalized by incorporating feedback from the public consultation. Comments received will be addressed, and the assessment or proposed measures/plans will be revised as necessary.
9.	Approval and Implementation	The final ESIA report along with mitigation plans will be submitted to the MPWD and the World Bank.
10.	Monitoring	Monitoring of ESIA implementation and management of risks throughout the project implementation

Methodology adopted for the Environmental and Social Impact Assessment was in accordance with the requirements of the World Bank ESF (ESSs), EIA Notifications of Ministry of Environment, Forest and Climate Change (MOEFCC), Indian Roads Congress and MoRTH Guidelines, and other national guidelines. The methodology adopted for the ESIA is as follows.

- a. **Baseline Information:** Key attributes of the sub-project area, including socio-economic data, land, physiography, drainage, geology, hydrogeology, land use, flora, fauna, forest / vegetation cover,

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climate, hazards, and vulnerability, were collected through both primary and secondary data sources. Primary data were gathered along the project corridor and within the direct impact area 500 m from the proposed RoW for sensitive environmental features and 12 m from the proposed RoW for social analysis. Secondary data were collected for a 10 km radius buffer surrounding the project road.

- b. To assess the baseline environment and social conditions, the data has been accessed from authentic and verifiable sources as given in Table 1.4 for collecting the primary data through consultation, field survey and secondary data. A due attempt has been made to source and access only the latest available data from authentic and verifiable sources.

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Primary environmental baseline monitoring is conducted in October 2025.

Table 1.6: Source and methodology for primary and secondary data collection

Parameters	Secondary Source
	Environment
Air	Primary Survey Primary Monitoring Secondary Source Central pollution control Board (CPCB, https://cpcb.nic.in/) / Meghalaya State Pollution Control Board (MSPCB https://megspcb.gov.in/)
Water	Primary Survey Primary Monitoring Secondary Source 1. District Survey Report, South West Garo Hills District, 2024(Announcements South West Garo Hills District India) 2.CGWBDData 2024 https://cgwb.gov.in/old_website/AQM/NAQUIM_REPORT/Meghalaya/SOUTH%20WEST%20GARO%20HILLS%20FINAL.pdf)
Noise	Primary Survey Primary Monitoring Secondary Source CPCB (https://cpcb.nic.in/regulation-control/)
Soil	Primary Survey Primary Monitoring Secondary Source 1.District Irrigation Plan 2016-2020(https://pmksy.gov.in/mis/Uploads/2017/20170331051403254-1.pdf) 2.Mapping India's Climate Vulnerability A District Level Assessment (2021) (https://www.ceew.in/sites/default/files/ceew-study-on-climate-

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Parameters	Secondary Source
	change-vulnerability-index-and-district-level-risk-assessment.pdf 1.
Biodiversity	Primary survey 1.Field observation 2.Vegetation assessment was conducted using Nested Quadrante method 4.Faunal assessment was conducted using Visual encounters, sign survey, line transect, and netting survey method 6.LULC analysis through ground truthing Secondary Source 1.Desktop study/secondary data collection - Govt. notified acts, peer review published scientific articles, Govt. reports, 2.Online open-source biodiversity databases such as Meghalaya Biodiversity Portal (https://megbiodiversity.nic.in/), PARIVESH Portal (MoEF&CC) (https://parivesh.nic.in/), Global Forest Watch (https://www.globalforestwatch.org/), IUCN Red List of Threatened Species(https://www.iucnredlist.org/) 3.Stakeholder consultation
Hazards and Vulnerability	Primary survey Field observation and Consultation with concerned departments and local community Secondary Source 1. District Disaster Management Plan for South West Garo Hills, 2024 https://southwestgarohills.gov.in/disaster-management/) 2. Meghalaya State Disaster Management Authority (MSDMA) (https://msdma.gov.in/)
Natural Environment	Secondary Source 1.Customized Rainfall Information System, Hydromet Division, IMD (https://hydro.imd.gov.in/) 2.District Census Handbook South west Garo Hills (https://southwestgarohills.gov.in/demography/) 3.Geological Survey of India(https://www.gsi.gov.in/webcenter/portal/OCBIS) 4. District Irrigation Plan 2016-2020 (https://pmksy.gov.in/mis/Uploads/2017/20170331051403254-1.pdf) 5. Consultant's Analysis, Source IMD Gridded Data(https://www.imdpune.gov.in/cmpg/Griddata/Rainfall_25_NetCDF.html)

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Parameters	Secondary Source
	6. State Action Plan on Climate Change (SAPCC), Meghalaya(https://moef.gov.in/uploads/2017/08/Meghalaya.pdf) 7. Statistical Handbook, Meghalaya 2023 (https://des.megplanning.gov.in/documents/SHB2023-as-on-02-05-24.pdf)
Climate	Secondary Source India Meteorological Department – Shillong Climatological Normals, (1991–2020) (https://dsp.imdpune.gov.in/home_normals.php#)
	Land and Livelihood Impact
Land, Livelihood and Common Property Resources	Primary survey 1.Census/Household Survey (PAH:5) 2.Focus Group Discussions (3) 3.Key Informants Interviews (25) 4.Field Observations Secondary Source Census 2011 (https://www.census2011.co.in/)
	Other Socio-Economic Parameters
Ethnicity	Primary survey Consultation Secondary Source Census 2011(https://www.census2011.co.in/)
Gender	Primary Survey Focus Group Discussion

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Parameters	Secondary Source
	<p>Interviews</p> <p>Secondary Source</p> <p>Workforce Participation Rate as per Census 2011 (https://www.census2011.co.in/)</p> <p>National Family Health Survey- 5</p> <p>(https://mohfw.gov.in › files › NFHS-5 Phase-II 0)</p>
Prevalence of GBV	<p>Primary survey</p> <p>Focus Group Discussions with women group</p> <p>Secondary Source</p> <p>Police records</p> <p>National Crime Records Bureau (NCRB)</p> <p>(https://ncrb.gov.in)</p>

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1.5 Structure of the ESIA Report

This Environmental and Social Impact Assessment (ESIA) report has been structured into ten chapters including this introduction chapter as follows in **Table 1.6**

Table 1.7.Chapters Descriptions

CHAPTER	DESCRIPTION
Chapter 1	INTRODUCTION, provides Background for the project, project roads, approach and methodology of the ESIA study
Chapter 2	LEGAL AND INSTITUTIONAL FRAMEWORK describes the state and central governments with their specific roles along with applicable acts and laws and comparison between the existing legislations and WB policy. As part of the targeted assessment for indigenous/tribal communities, this chapter includes the legal and institutional framework applicable to indigenous/tribal communities.
Chapter 3	PROJECT ROAD DESCRIPTION – In this chapter, project stretch details are described from an environmental and social perspective with salient features such as RoW, cross sections, traffic projections, corridor characteristics, settlements, and resource requirements etc.
Chapter 4	BASELINE ENVIRONMENT chapter describes the existing baseline environmental conditions and collection of secondary information regarding physical, biological and socio-economic conditions of the study area and environmental quality of the study area – monitoring of air, noise, soil, surface and ground water. As part of the targeted assessment, Baseline data focuses on the demographic, social, cultural, and political characteristics of the indigenous/tribal communities; the land and territories that they have traditionally owned or customarily used or occupied; and the natural resources on which they depend.
Chapter 5	ENVIRONMENTAL AND SOCIAL RISKS AND IMPACTS – Describes the potential risks and impacts on valued environmental and social components during various project phases including pre construction, construction and operational phases. As part of targeted assessment for indigenous/tribal communities, RAP-IPDP and ESMP includes the measures necessary to avoid adverse impacts, or if such measures are not feasible, measures to minimize, mitigate, or compensate for such impacts, and to ensure that the indigenous/tribal communities receive culturally appropriate benefits under the project, thus overall resulting in community-led development and decision making in the project-affected tribal areas. This is based on meaningful consultation tailored to indigenous/tribal communities and, where relevant, on Free, Prior, and Informed Consent (FPIC).
Chapter 6	ANALYSIS OF ALTERNATIVES, with project and without project scenario. The mitigation hierarchy approach guided the impact assessment and analysis of alternatives— to explore alternative routes and designs to minimize adverse impacts. Additionally, potential mitigation measures were identified to reduce or eliminate negative effects and enhance positive outcome.

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CHAPTER	DESCRIPTION
Chapter 7	STAKEHOLDER CONSULTATION AND INFORMATION DISCLOSURE describes the various stakeholders and outcome of the stakeholder consultation. As part of targeted assessment for indigenous/tribal communities, the chapter includes the identification of project-affected parties and the elaboration of a culturally appropriate process (FPIC) for involving and consulting with the indigenous/tribal communities in their vernacular medium at each stage of project preparation and implementation;
Chapter 8	ENVIRONMENTAL AND SOCIAL MONITORING & REPORTING PROGRAMME This chapter includes reporting, monitoring and institutional framework of the project.
Chapter 9	GRIEVANCE REDRESSAL MECHANISM
Chapter 10	CONCLUSION AND RECOMMENDATIONS

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2. LEGAL & INSTITUTIONAL FRAMEWORK

This chapter involves review of all acts, rules and policies that are applicable to the proposed road development.

2.1 Applicable Environmental and Social Regulations/ Acts/ Policies at National and State Level

To understand the scope of the environmental and social assessment for the proposed improvements or road works, the relevant laws, legislation, and policies at the national and state levels were reviewed and summarized in Table 2.1 below, including an examination of the legal and institutional frameworks applicable to indigenous and tribal communities as part of the targeted assessment

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Table 2.1: Applicable Environmental and Social Regulations/ACTs/Policies

Sl. No.	Relevant Acts and Policies	Mandate of the Act/ Policy	Reason for applicability/ Non-applicability	Regulatory Requirement	Clearance	Authority
ENVIRONMENTAL REGULATIONS						
1	Environment Protection Act/ Rules 1986	The Environment Protection Act, 1986 (the "Environment Act") provides for the protection and improvement of the environment. Under the Environment Act, the Central Government issues notifications 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 apply to MPWD works.			Meghalaya State Pollution Control Board (MSPCB)
2	EIA Notification 14th Sep 2006 and 17 March 2025	Borrowing of minerals (earth, sand, aggregates, etc.) will require prior environment clearance under mining category	Borrowing of minerals (earth, sand, aggregates, etc.) for embankment, bridge, approach road construction	Environmental	Clearance through Contractor	SEIAA Meghalaya
3	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.	Air pollution from proposed Batching Plant or Hot mix plants and DG set during construction stage	Consent to Establish before Construction and Consent to Operate (Before Operation)	through Contractor	Meghalaya State Pollution Control Board (MSPCB)
4.	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.	Water pollution during the construction stage from labour camp	Consent to Establish before Construction and Consent to Operate (Before Operation)	through Contractor	Meghalaya State Pollution Control Board (MSPCB)

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5.	Noise Pollution (Regulation and Control Act) 2000 and amendment till date	The ambient noise standards for day and night across various land use categories were notified by the MoEF&CC under the Noise Pollution (Regulation and Control) Rules, 2000, based on recommendations of the CPCB	Noise emission from proposed activities during construction stage like operation of DG sets, equipment and concrete mixers should be within applicable standards	regulatory clearance not required but noise monitoring results should be below applicable standard as per CPCB .	MSPCB
6	Hazardous & Other Wastes (Management and Trans-boundary Movement) Rules, 2016 and March, 2024	Protection against improper handling, storage and disposal of hazardous waste. The rules prescribe the management requirement of hazardous wastes from its generation to final disposal.	Hazardous waste generation from proposed activities like generation of paints waste, used oil/waste oil, bitumen waste, etc.	Contractor to obtain authorization for storage, transport, and disposal of hazardous and other wastes	MSPCB
7	Construction and Demolition Waste Management Rules, 2016	To manage the demolition and construction waste and prevent environmental degradation	Construction and demolition waste will be generated from proposed activities	Permission will be required by Contractor.	Village Council, Municipal Boards
8	Solid Waste management Rules, 2016 and amended thereof	To manage solid waste or semi-solid domestic waste, sanitary waste	Solid Waste will be generated from proposed activities due to influx of labour	Permission will be required Contractor needs to submit plan for reuse or safe disposal	Village Council, Municipal Boards

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9	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.	Transportation of manpower and material will involve vehicular movement. Vehicles must have valid Pollution Under Control (PUC) certificates, Insurance, Fitness Certificate. Driver should have valid Driving License.	PUC and fitness certificates, Insurance. Driving License, Fitness Certificate	State Transport Authorities approved PUC certificate providers
10	The Gas Cylinder Rules 2016	To regulate the storage of gas / possession of gas cylinder more than the exempted quantity.	Gas cylinders may be used during welding and other electromechanical work. Storage within threshold quantity and as per capability analysis. Handling with defined safe practices	Yes, Permission will be required by the Contractor if the storage of gas / possession of gas cylinder is more than the exempted quantity (i.e more than 25 cylinders of total weight exceeding 200 kg for flammable non-toxic gases).	Petroleum and Explosives Safety Organization (PESO)
11	The Mines and Minerals (Development and Regulation) Act, 1957	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.	The construction of works will require stones, aggregates, sand, earth, etc.	Mining Permit from regional mine office. The EC is also required for some minor minerals.	Mines and Mineral Department

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12	The Forest (Conservation) Act, 1980 and Amendments and The Forest (conservation) Rules 1981 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 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	There is no requirement of diversion of forest land for this road section as all the project activities will be done on Existing ROW.	No	State Forest Department, MoEF&CC
13	National Forest Policy 1988	It articulates the twin objectives of ecological stability and social justice; recognizes people's dependence and their symbiotic relation with forest, emphasizes protection of people's rights over forest resource and offers space for participation of forest dependent communities in the conservation, protection and management of state-owned forests.	Provisions of this act will not be applicable since road will not adversely affect any forest.	No	State Forest Department, MoEF & CC

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14	Meghalaya Forest Regulation (Application and Amendment) Act, 1973	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.	Provisions of this act will not be applicable since road will not adversely affect any biological diversity	No	Meghalaya State Biodiversity Board
15	Meghalaya Forest Regulation (Application and Amendment) Act, 1973	Conservation of forest and controlled felling of trees and forest produce	Provisions of this act will not be applicable since the road does not have communities dependent on forest produce.	No	State Forest Department
16	Meghalaya 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	Provisions of this act will not be applicable since road will not adversely affect any biological diversity	No	Meghalaya State Biodiversity Board
17	Wildlife protection Act 1972, 2022	Protection of wildlife in the state of Meghalaya	Wildlife impact is not anticipated in this project..	No	State Forest Department

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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	No ESZ falls within 10 km of the project road as per the Map provided by Forest Department.	No	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.	No forest area diversion involved in the project. Approximately 15 trees are to be felled and shall be compensated (1:10) as per the Act.	No	State Forest Department
20	Meghalaya State Compensatory Afforestation Fund Management and Planning Authority (MSCAFMPA). This body was constituted in alignment with the Compensatory Afforestation Fund Act, 2016	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	No forest area diversion involved in the project	No	State Forest Department

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21	Meghalaya Tree (Preservation) Act, 1976, and the Meghalaya Tree Felling (Non-Forest Areas) Rules, 2006	Conservation of forest and controlled felling of trees	Approx. 15 nos of tree are falling within the ROW.	Permission for felling of trees	State Forest Department
22	Disaster Management Act, 2005	The purpose is to have an effective management of disasters and for matters connected therewith or incidental thereto	The project area falls under the seismic (earthquake prone) zone V and hence construction activities/ interventions will be under purview of this act	No. Contractor should be aware of Guidelines/SOPs/Advisory of MSDMA	Meghalaya State Disaster Management Authority (MSDMA)/MPWD
23	Meghalaya Disaster Management Rules, 2008	The rule 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	During implementation, setting of labour camps and capacity building of contractor staff	No Contractor should be aware of Guidelines/SOPs/Advisory of MSDMA	Meghalaya State Disaster Management Authority (MSDMA)/MPWD
24	Energy Conservation Act, 2001	The objective is for efficient use of energy and its conservation and for matters connected therewith or incidental thereto	Project activities involves use of energy efficient equipment, energy conservation buildings, etc.	No	Bureau of Energy Efficiency (BEE)/ Meghalaya State Designated Agency (MSDA)

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25	Plastic waste management Rules, 2016	The Plastic Waste Management Rules, 2016 provide a framework for the effective management of plastic waste. They aim to minimize the adverse environmental impact of plastic waste and promote sustainable practices for its handling and disposal.	Plastic waste generation from proposed activities. Safe disposal as per Rules	No. Properly segregate plastic waste at source and hand it over to authorized waste collectors, local bodies, or MSPCB authorized agencies/Recyclers	Village Council/ Municipal Authority/MSPCB
26	E-Waste Management Rules, 2016 and amended thereof	Protection of environment against improper handling storage and disposal of hazardous waste.	E-waste generation from replacement of instrumentation. Safe disposal as per Rules	No. Proper segregation and handing over of e-waste to the MSPCB authorized agencies/Recyclers	MSPCB
27	Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)	This international convention, to which India is a signatory category, lists the endangered flora and fauna and regulates trade of these species	Project Intervention does not involve any trade of Endangered species	No	Meghalaya Forest Department and Wildlife Crime Control Bureau, MoEF&CC
28	Petroleum Act, 1934, Petroleum Rules, 2002 (under the Petroleum Act, 1934)	Regulates the storage, transport, handling, and use of petroleum and diesel. Requires licenses for storage of petroleum products beyond prescribed limits.	Storage of High Speed Diesel (HSD) at construction sites (above threshold limits of 2,500 liters underground or 1,000 liters aboveground in drums/tanks) requires license/approval.	License for storage from PESO (Petroleum and Explosives Safety Organization); NOC from District Authority/Fire Department.	PESO, Nagpur (through Regional Office) & District Magistrate/Chief Controller of Explosives.

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29	Ground Water Regulation (Central Ground Water Authority – CGWA Guidelines, 2017, adopted by States)	Governs the extraction of groundwater for industrial, infrastructure, or commercial use. Requires NOC/permission prior to abstraction.	Applicable (if groundwater extraction proposed) Groundwater extraction for construction, camp use, or dust suppression requires prior permission.	NOC for groundwater abstraction.	CGWA or State Ground Water Authority (if notified).
30	The Meghalaya Water Act, 2011 ▪	State-level mandate for use of surface water from rivers, streams, ponds, lakes, etc. for non-domestic/commercial purposes.	Construction water requirements may involve use of surface water from nearby streams/rivers with state approval. Surface water from the Daru river can be used for road construction with prior permission from the concerned Irrigation Department/Water Resources Department, South West Garo Hills District, Meghalaya.	Permission/Allocation order for surface water abstraction.	Water Resources/Irrigation Department, Government of Meghalaya.
SOCIAL REGULATIONS					

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1	The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013	<p>The Act ensures transparent land acquisition with fair compensation, rehabilitation, and resettlement. It sets minimum compensation norms, R&R entitlements, and facilities for the displaced, allowing states to enhance benefits.</p> <p>The Act also includes special provisions to protect the interests of Scheduled Castes and Scheduled Tribes.</p>	<p>Yes, as the area falls under 6th schedule</p> <p>A review of the legal and institutional framework applicable to indigenous/tribal communities.</p>	No	<p>Revenue Department, Government of Meghalaya, Garo Hills Autonomous District Council</p> <p>The Sixth Schedule establishes the ADC or VC as institutional mechanisms for governing these areas.</p>
2	Meghalaya Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Rules, 2017	<p>Aim to provide a fair, transparent, and participatory process for land acquisition while ensuring adequate compensation and rehabilitation for affected families. These rules align with the broader objectives of the RFCTLARR Act to minimize the adverse impact of land acquisition and promote the welfare of those affected by it.</p>	Impact on private Assets and properties	Ensure fair compensation and Guarantee transparency in the acquisition process.	Revenue Department/ District Administration, Village Council

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3	Notification Land Acquisition through Direct Purchase by way of negotiated settlements for all departments in the state of Meghalaya, March, 2022	It recommends land purchase through negotiation (and mutual consent) as the best approach by paying the landowners an incentive of 25%, inclusive of R&R benefits on the compensation calculated as per the provisions of Section 26 to 30 and First Schedule of the RFCTLARR Act.	Direct Negotiated settlement can be faster method of land acquisition	No	MPWD, Revenue Department/ District Administration, Village Council
4	Street Vendors (Protection of Livelihood and Regulation of Street Vending) Act, 2014 & Meghalaya Street Vendors (Protection of Livelihood and Regulation of Street Vending) Rules, 2016	It regulates street vending and protects the rights of street vendors by legalizing their right; protects them from sudden eviction or relocation; spells their rights and obligations.	Applicable to all Project road corridors in case of economic displacement and relocation of street vendors.	No	District Administration/ District Municipal Authority, Village Councils under the Autonomous District Councils
5	Rights of Persons with Disabilities Act, 2016	Ensures that the Persons with Disability (PWD) enjoy the right to equality, life with dignity, and respect for his or her own integrity equally with others.	For the entire Project road corridor where PwD are present and affected, and for designing the project in an inclusive manner.	No	Department of Social Welfare, Government of Meghalaya

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6	Right to Information Act, 2005	The Act provides for setting out the practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, the constitution of a Central Information Commission and State Information Commissions and for matters connected therewith or incidental thereto.	All documents pertaining to the project would be disclosed to public.	No	Public Information Officer (PIO)
7	Article 244(2) & 275(1) of the Constitution of India - The Sixth Schedule	Article 244(2) establishes Autonomous District Councils (ADCs) in tribal areas, granting them legislative and administrative powers, empowering them to legislate on land, resources, and local governance. Article 275(1) provides financial grants for the welfare and development of Scheduled Tribes and Scheduled Areas	Applicable in designated tribal areas under the Sixth Schedule	No	Government of India, Autonomous District Councils

LABOUR LAWS APPLICABLE TO ESTABLISHMENTS ENGAGED IN BUILDING AND OTHER CONSTRUCTION WORK

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1	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.	Applicable for all building or other constructions works under the project that employs 10 or more workers.	Establishment Registration is required	Labour Commissioner, Meghalaya
2	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 Project road corridors	Workmen compensation Insurance Policy	Commissioner for Workmen's Compensation
3	ESI Act, 1948 (Employees State Insurance Act, 1948)	Employees State Insurance Act provides for health care and hospitalization benefits for construction work force	Construction workers will be involved in the Project Road corridors	Insurance Policy.	Commissioner for Workmen's Compensation
4	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	Construction workers will be involved in the Project Road corridors	Registration/Labour license	Labour Commissioner, Meghalaya

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5	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 and less than 18 years) in any hazardous activity.	No	Labour Commissioner, Meghalaya/ Department of Social Welfare, Government of Meghalaya
6	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	No	District Officer (District Magistrate or Additional District Magistrate)

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7	Contract Labour (Regulation & Abolition) Act 1970	To provide proper and habitable working conditions. To regulate the functioning of the advisory boards. To lay down the rules and regulations regarding the registration procedure of the establishments employing contract labour	Applicable to all implementing agencies	Labour License Required	Labour Commissioner, Meghalaya
8	Payment of Wages Act, 1936 and the Minimum Wages Act, 1948	Lays down as to by what date, wages are to be paid, when it will be paid and what deductions be made from the wages of the workers, if any.	Applicable to all implementing agencies	No	Labour Commissioner, Meghalaya
9	Payment of Gratuity Act, 1972 The payment of gratuity rules Meghalaya 1972	Gratuity is payable to an employee under the Act on satisfaction of certain conditions on separation, if an employee has completed 5 years of service with employer	Applicable to all implementing agencies	No	Labour Commissioner, Meghalaya

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10	Employees Provident Fund and Miscellaneous Provision Act, 1952	Provides for monthly contributions by the employer and as well as by workers with a provision as return of pension of a lump sum (principal and interest accrued) at the end of his/her service term).	Applicable to all implementing agencies	No	Labour Commissioner, Meghalaya
11	Maternity Benefit Act, 1951 Meghalaya Maternity benefit Rules 1965	Provides for maternity leave for women, during pregnancy and after giving birth and some other benefits to women employees, in case of medical recommendation of bed rest or miscarriage etc.	Applicable to all implementing agencies	No	Labour Commissioner, Meghalaya
12	Payment of Bonus Act, 1965 The Payment of Bonus Rules Meghalaya 1975	Provides payments of annual bonus subject to a minimum of 8.33% of wages and maximum of 20% of wages.	Applicable to all implementing agencies	No	Labour Commissioner, Meghalaya

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13	The Bonded Labour (Abolition) Act 1976 Bonded Labour System (Abolition) Rules 1976	An Act to provide for the abolition of bonded labour system, with a view to prevent economic and physical exploitation of the weaker sections of the people and for all matters connected there with or incidental thereto	Applicable to all implementing agencies	No	Labour Commissioner, Meghalaya
14	The Trade Union Act, 1926	Lays down the procedure for registration of trade union of workers and employers. The trade unions registered under the Act have been given certain immunities for civil and criminal liabilities.	Applicable to all implementing agencies	No	Labour Commissioner, Meghalaya
15	Schedule Caste and Schedule Tribe (Prevention of Atrocities Act 1989)	Atrocity with SC and ST community is defined as an offense punishable under Section 3 of the Act	Project Area is protected under Sixth Schedule of the Constitution	No	Social Welfare Department, Meghalaya

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16	The Meghalaya Highways Act, 1972	Regulates road development and transport services in Meghalaya to ensure planned infrastructure, maintenance, and efficient transport operations while promoting safety.	Applicable to all road development and transport projects in Meghalaya	No	Government of Meghalaya, Public Works Department (PWD)
17	Meghalaya Right to Public Services Act, 2020	Ensures timely delivery of notified public services to citizens by government departments, enhancing transparency, accountability, and efficiency in governance.	Applicable to all government departments and public service providers in Meghalaya	No	Meghalaya State Public Services Delivery Commission (MSPSDC)

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2.2 IRC AND MORTH Codes Applicable to the Project

All road works in India must comply with the IRC, MoRTH guidelines and BIS Codes. Key relevant IRC codes that may directly or indirectly influence the environmental and social management during the design, construction and operational phases are given in **Annexure 2.1**.

2.3 Relevance of WB E&S Standards 1 TO 10

Applicability of ESS1 to 10 is given in **Table 2.2**.

Table 2.2: Relevance of ESS 1 to 10

WB E&S Standards	ESS Description and Objectives	Relevance and Significance to the Project	Applicability	Responsibility
ESS 1 – Assessment and Management of Environmental and Social Risks and Impacts	<p>ESS1 outlines the Borrower's duties for evaluating, handling, and tracking environmental and social risks and impacts at each phase of a project</p> <p>Involves Preparation of ESA, ESIA, ESMF, RAP.</p>	Project may involve potential environmental and social risks due to construction activities under the project.	Yes	ESIA/DPR/MPWD
ESS 2 – Labour and Working Conditions	<p>ESS2 highlights the vital role of job creation and income generation in reducing poverty and fostering inclusive economic growth. Borrowers can improve project outcomes by ensuring fair treatment of workers and providing safe, healthy working conditions.</p> <p>Objectives include promotion of health, safety, equal opportunity at work and to protect vulnerable workers. Aims to prevent forced and child labour and</p>	All project construction activities must guarantee the elimination of child labor and forced labor, while ensuring the implementation of operational health and safety standards, as well as a grievance redressal mechanism for the welfare of workers.	Yes	ESIA/MPWD/Contractor/C SC

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WB E&S Standards	ESS Description and Objectives	Relevance and Significance to the Project	Applicability	Responsibility
	to provide workers with accessible means to raise workplace concerns.			
ESS 3 – Resource Efficiency, Pollution Prevention and Management	<p>ESS3 acknowledges that economic activity and urbanization contribute to pollution and resource depletion, which can harm people, ecosystems, and the environment locally, regionally, and globally.</p> <p>Objectives include promotion of sustainable use of resources, minimize project-related pollution and emissions, minimize generation of hazardous and non-hazardous waste and manage the risks and impacts associated with pesticide use</p>	<p>Construction and Demolition activities and provision of support facilities require waste and pollution management during construction and operations; prevention of risks due to chemicals and hazardous material use. Efficient use of raw material resources Energy, Air, Water, reuse of wastes and ensuring circularity etc. are important for overall sustainability.</p>	Yes	ESIA/MPWD/Contractor/CSC
ESS 4 – Community Health and Safety	<p>ESS4 acknowledges that project activities, equipment, and infrastructure can heighten community exposure to risks and impacts.</p> <p>The major objective is to anticipate and avoid adverse impacts on the health and safety of project-affected communities during the project life cycle.</p>	<p>It is of paramount importance to prioritize community health and safety through the careful design of infrastructure, products, and associated services in road construction projects involving extensive civil works.</p>	Yes	ESIA/DPR/MPWD/Contractor/CSC
ESS 5 – Land Acquisition, Restrictions on Land Use, and Involuntary Resettlement	<p>ESS5 acknowledges that land acquisition and land use restrictions for projects can negatively affect communities,</p>	<p>Land acquisition might be required as part of the project for road expansion and it is necessary to prioritize the</p>	Yes	ESIA/DPR/MPWD /RP Implementation Agency

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WB E&S Standards	ESS Description and Objectives	Relevance and Significance to the Project	Applicability	Responsibility
	<p>causing physical and economic displacement. "Involuntary resettlement" occurs when affected individuals or communities cannot refuse these actions.</p> <p>Major objective is to avoid or minimize involuntary resettlement. Other objectives include avoiding forced evictions, mitigate unavoidable adverse social and economic impacts from land acquisition and improve the living conditions of vulnerable persons.</p>	<p>protection of people's rights, ensuring a fair and transparent procedure. Respecting landowners' rights fosters community trust, reduces conflicts, and supports social equity. A rights-based approach guarantees that affected individuals are treated justly and project proceeds smoothly.</p>		
ESS 6 – Biodiversity Conservation, and Sustainable Management of Living Natural Resources	<p>ESS6 acknowledges that safeguarding and conserving biodiversity, along with the sustainable management of living natural resources, are essential for achieving sustainable development.</p> <p>The objectives include protection and conservation of biodiversity and habitats, ensure cautionary approach in project design and implementation which impact biodiversity and promote the sustainable management of living natural resources.</p>	<p>The assessment and mitigation of impacts and risks to biodiversity and living natural resources, arising from both the implementation and operation phases, are crucial for linear projects that traverse extensive and diverse land areas.</p>	Yes	ESIA/DPR/MPWD/Contractor/CSC
ESS 7 – Indigenous Peoples	<p>ESS7 recognizes that Indigenous Peoples are often</p>	<p>The socio-economic assessment and the integration of a</p>	Yes	ESIA/DPR/MPWD/CSC/C

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WB E&S Standards	ESS Description and Objectives	Relevance and Significance to the Project	Applicability	Responsibility
	<p>disadvantaged by traditional models of development and supports poverty reduction and sustainable development by ensuring that projects enable Indigenous Peoples and communities to participate in and benefit from development, while safeguarding their cultural identities and well-being</p> <p>The major objectives include ensuring that the development process fully respects the human rights, dignity, aspirations, identity, culture, and natural resource-based livelihoods of Indigenous Peoples, while avoiding any adverse impacts on them.</p>	management plan for the affected Indigenous communities are essential, given the context through which the project road passes.		contractor
ESS 8 – Cultural Heritage	<p>ESS8 acknowledges that cultural heritage serves as a link between the past, present, and future, encompassing both tangible and intangible forms. ESS8 outlines measures aimed at protecting cultural heritage throughout the entire project lifecycle.</p> <p>Its objectives are to protect cultural heritage from adverse impacts of project activities and to address cultural</p>	Impacts and risks on cultural heritage during the construction and operation periods should be considered to preserve and protect valuable historical, cultural, and archaeological sites. These elements are vital for maintaining cultural identity, community values, and social cohesion. Neglecting to address potential risks can lead to irreversible damage, loss of heritage, and	Yes	ESIA/DPR/MPWD/Contractor/CSC

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WB E&S Standards	ESS Description and Objectives	Relevance and Significance to the Project	Applicability	Responsibility
	<i>heritage as an integral aspect of sustainable development.</i>	<i>conflicts with local communities, thereby undermining the sustainability and social acceptance of the project.</i>		
ESS 9 – Financial Intermediaries	<p><i>ESS9 highlights the importance of strong domestic capital markets and access to finance for economic development, growth, and poverty reduction. The Bank is committed to supporting sustainable financial sector development and strengthening the role of domestic markets.</i></p> <p><i>The major objective is to outline how the FI will assess and manage the environmental and social risks and impacts linked to the subprojects it finances.</i></p>	<p><i>ESS9 would not be specifically required because there are no third-party financial intermediaries involved.</i></p>	No	
ESS 10 – Stakeholder Engagement and Information Disclosure	<p><i>ESS10 emphasizes the importance of open, transparent engagement between the borrower and project stakeholders as a key element of good practice.</i></p> <p><i>Objectives include creating a systematic approach for identifying stakeholders and fostering constructive relationships with them, to assess the level of stakeholder interest and support and to ensure the timely, clear, accessible, and</i></p>	<p><i>Effective stakeholder engagement enhances environmental and social sustainability, improves project acceptance, and contributes to successful project design and implementation.</i></p>	Yes	<i>ESIA/DPR/MPWD/Contractor/CSC</i>

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WB E&S Standards	ESS Description and Objectives	Relevance and Significance to the Project	Applicability	Responsibility
	<i>appropriate disclosure of relevant project information on environmental and social risks and impacts to stakeholders.</i>			

2.4 Comparative Analysis Of Existing State/National Legislations and World Bank ESF

Meghalaya Public work department (MPWD) has undertaken a comprehensive gap analysis of applicable laws and regulation against the World Bank's Environmental and Social Standards (ESS) requirements. The detailed table on comparative analysis is attached as **Annexure 2.2**.

2.5 Land Revenue Governance and Administration in GHADC

When Meghalaya was formed in 1972, the Garo Hills Autonomous District Council (GHADC) was retained with its mandate and governance framework largely unchanged. Over time, the Autonomous District Councils (ADCs) have undertaken efforts to codify tribal customary laws through legislations enacted under their authority. Traditional customary institutions have maintained a strong presence in the region, and despite the historical shifts introduced by the British administration and subsequently the Indian State, these institutions have continued to function adapting their practices to align with evolving legal and administrative frameworks.

The Sixth Schedule of the Constitution of India provides the framework for the establishment of Autonomous District Councils (ADCs) in tribal areas. Members of the ADCs are elected by the tribal population for a term of five years. The Garo Hills ADC functions with its own rural and urban local bodies, serving as an important institutional layer of governance.

ADCs act as a bridge between formal state structures and traditional tribal institutions, ensuring that governance reflects both constitutional provisions and customary practices. The Sixth Schedule establishes a system of autonomous, decentralized governance, endowing ADCs with legislative, executive, and judicial powers, including authority to adjudicate certain categories of civil and criminal cases.

In rural areas, traditional institutions such as the Nokmas a two-tier political system among the Garos continue to play a central role. In practice, it is not the State Government, but rather the Autonomous District Councils (ADCs) in conjunction with tribal institutions, that function as the primary authorities for the administration and management of natural resources, including land. In the Garo Hills, the traditional village chief (Nokma) is regarded as the owner and custodian of community lands. In practice, the Nokma's husband exercises rights to manage the land through his wife, and may dispose of land only with her consent. Village inhabitants are entitled to cultivate as much land as they require, and may select plots within the village boundary, subject to the Nokma's approval. Outsiders are also permitted to settle in the village, provided they offer either an annual rent or a one-time gift/present to the headman. Details of land procurement mechanisms are provided below in Table 2.3.

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Table 2.3: of land procurement mechanisms

Category	Garos
Basis of classification	Ownership of land
Type of land	2 types of ownership 4 sub-categories of ownership
Control and Management	The ancestral head Nokma (head of the clan) manages and allots land to the community. While the Maharis (clan members) look after A-jinma land.
Inheritance	Women inherit and own property: It is usually the youngest daughter who inherits the property.
Records	Pattas are the primary records available in the region, dating from the colonial period. J.D. Walker demarcated the A.king land boundaries and gave the Nokmas settled maps in the late 1920s. The availability of patta documents in the villages part of the study show the colonial legacy which is often the only record of the land. (Marak, 1986). Garo Hill Autonomous District Council (GHADC) is known to have the maps for large parts of the district in the Garo Hills.
Systems for sale/purchase/ mortgage	Pattas are instrumental in mortgaging land in the bank for loans. Selling of the land in the village required Nokmas presence as witness. Any transactions or inheritance pertaining to the land is recorded in the patta at the District Council, Office
Managing private property	The Nokma (heiress) is the owner of family property and has a say in management of both movable and immovable property, whether ancestral or self-acquired. Customarily, no property can be disposed of without the consent of the heiress. However, there might be variations in practice.
Managing community property	For the community lands, the power to make decisions is vested in the nokma of the village. For the clan land, the nokna (in heiress) along with her husband and the chras (brothers and maternal uncles) decides together. Any such transaction undertaken without prior consent of the wife (nokna) and her Chra is considered null and void (Marak, 1986).

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3. PROJECT ROAD DESCRIPTION

3.1 Ampati to Purakhasia Road (AP)

The Proposed Road existed before the formation of Meghalaya state and ROW is limited only up to the existing Drain. The proposed AP project road (Corridor 8) has a total length of 8 km, commencing from Chopapara Village at Chainage 20+000 to Purakhasia Village at Chainage 28+000

3.2 Location Details of the AP Road

This stretch traverses a diverse landscape, including hilly terrains, agricultural lands, scrublands, built-up areas, and passes through, 03 villages including 04 habitations . The AP Road serves as a critical regional connector, enhancing access to economic hubs, industrial centers, and tourism destinations.

Table 3.1 presents the chainage-wise details of Corridor 8 while **Figure 3.1** illustrates the road alignment map.

Table 3.1: Chainage wise AP Road details

Sl. No.	Starting Chainage	End Chainage	Corridor No.	Project length as per DPR	Districts
1	20+000	28+000	8	8	South West Garo Hills

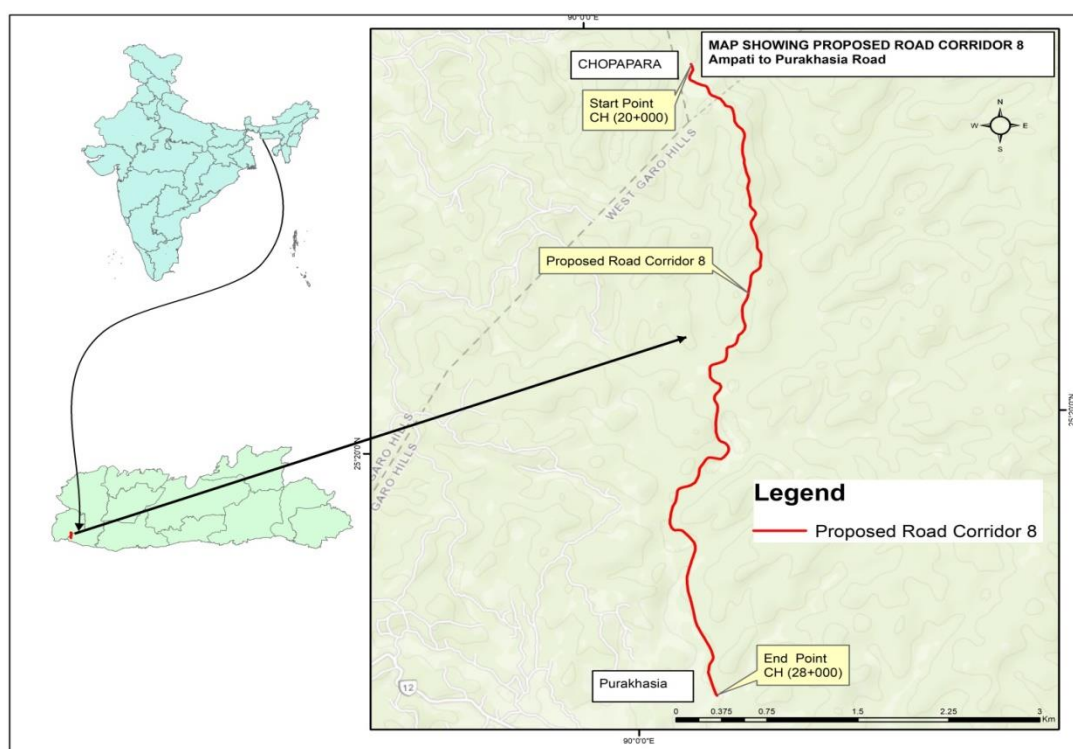


Figure 3.1: Road alignment map for AP Road

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3.3 Project Study Area (Project Influence Area)

For the purpose of this study, the Project Influence Area has been categorized in three tiers to facilitate a holistic environmental and social impact of the road stretch and to minimize potential environmental and social risks. Three tiers are given below

1. 12 m of ROW for Direct Impact (6m from Centre line)
2. 500 m buffer for indirect impact area ¹
3. 10 km of study area

The existing and proposed Right of Way (RoW) of the corridor has been considered adequate for characterizing baseline conditions and for assessing direct socio-economic impacts, including the profile of affected persons, religious structures, and common property resources.

The study impact area has been delineated as 0.5 km on either side of the proposed RoW from the Centre line. This buffer has been considered adequate to cover drainage channels, biodiversity-rich zones, natural habitats, protected areas, agricultural land, landslide- and landslip-prone stretches, marshy areas, surface water bodies, physical features, and settlements, among others

The LULC map of the direct impact area is presented in **Figure 3.2**.

The project influence area has been delineated with a buffer of up to 10 km from the periphery of the proposed RoW to identify environmentally sensitive features such as protected areas, wildlife sanctuaries, national parks, wetlands, and wildlife corridors. 10 km Buffer area for project road is presented in **Figure 3.3**. Map showing distance from Eco sensitive Zones w.r.t Project Road is presented in Figure 3.4.

¹ Based on Earlier experiences it was observed that dust, noise and other environmental parameters would get attenuated/diluted to meet existing baseline conditions within 500 m from the source.

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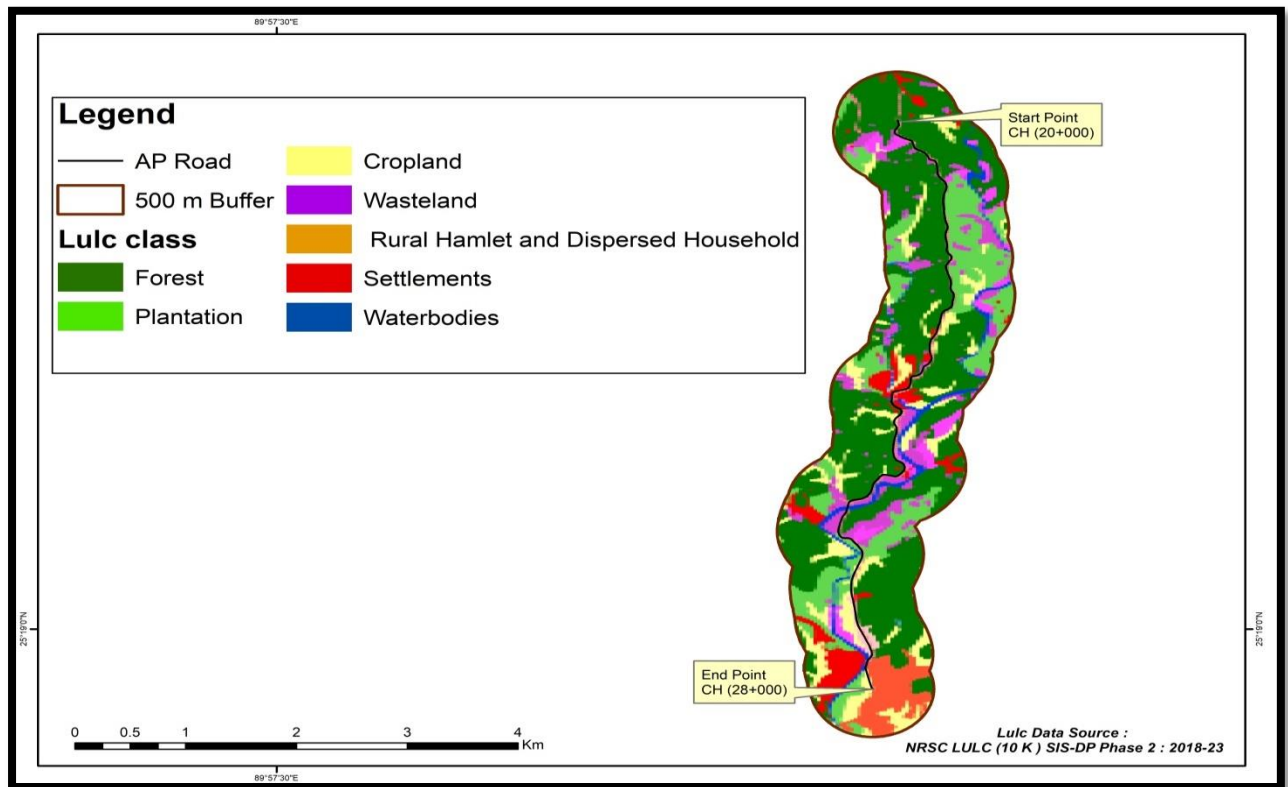


Figure 3.2: The LULC map of the direct impact area

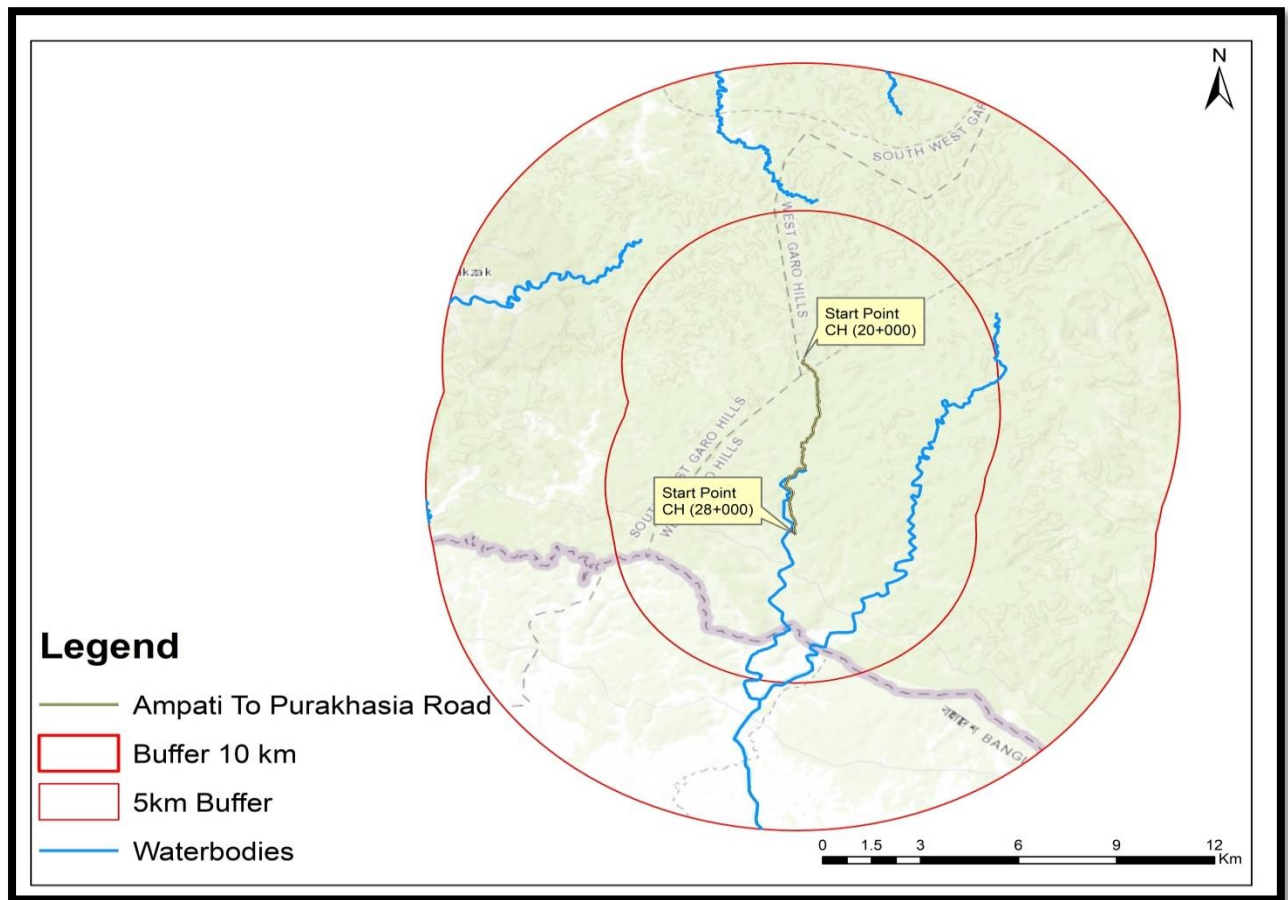


Figure 3.3: 10km Buffer area for project road

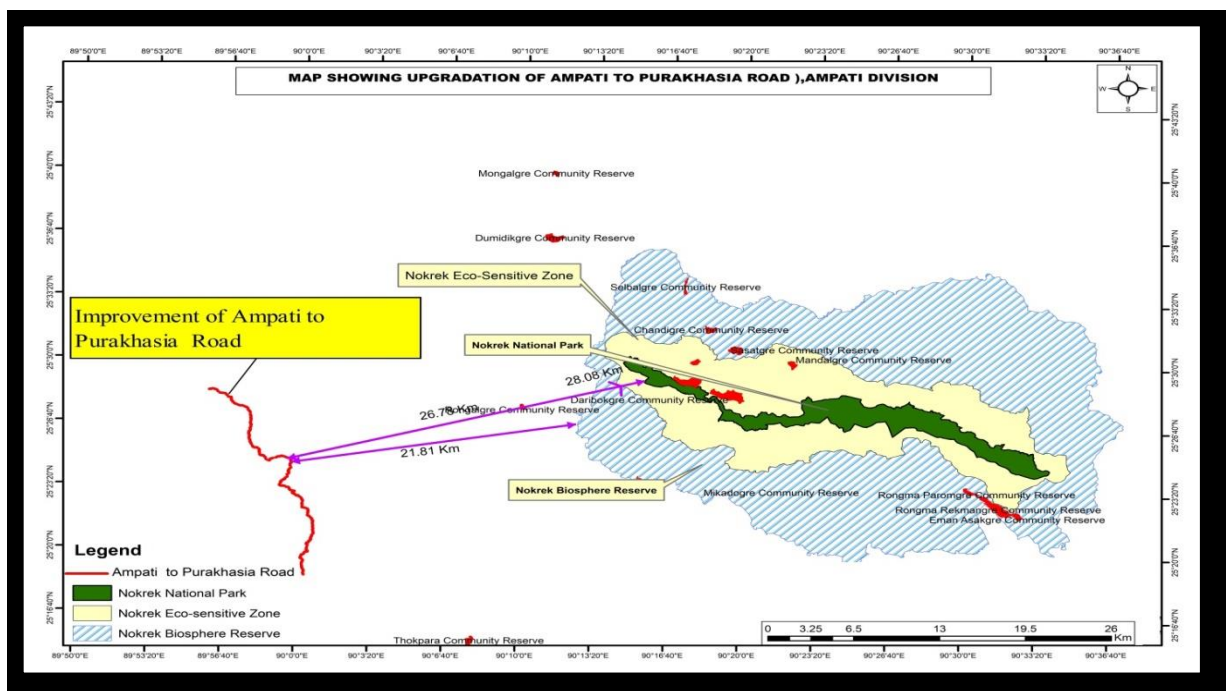


Figure 3.4: Map showing Environmental sensitivity of project road

The following sections of this chapter provide details of the existing road characteristics, key project components, resource requirements and proposed improvements.

3.4 Key Existing Conditions and Proposed Improvements of the AP Road

The key existing conditions and proposed improvements for the AP project roads are presented in the following sub-sections. These have been compiled based on primary field surveys and the Detailed Project Report (DPR).

3.4.1 Right of Way, Carriage Width and Pavement Conditions

The Right of Way (RoW) and Carriage Way (CW) for the 8 km sub-project road are summarized in **Table 3.2**. The existing road conditions are generally good, except potholes prevalent across some stretches. Inadequate drainage exacerbates deterioration during rainfall, making traffic movement difficult, particularly on earthen sections.

Existing Carriage width of Sub Project road is 5.5 m and Rehabilitation and improvement work will be done on Existing RoW.

Table 3.2: Details of Existing Carriage way

From Chainage 19+000 to 20+200

Chainage		Terrain	Adjacent Landuse Pattern	Village / Town Name	Carriageway			Shoulder			Drainage (Lined / Earthen)
From	To	Plain Rolling Hilly			Surface Type	Width (m)	Condition	Type	Width (m)	Condition	
19+000	19+100	Hilly	Open	-	Bitumen	5.5	Fair		1.00	Poor	Earthen
19+100	19+200	Hilly	Open	-	Bitumen	5.5	Fair		2.00	Poor	Earthen
19+200	19+300	Hilly	Open	-	Bitumen	5.5	Poor		3.00	Poor	Earthen
19+300	19+400	Hilly	Open	-	Bitumen	5.5	Poor		4.00	Poor	Earthen
19+400	19+500	Hilly	Builtup	Chopapara	Bitumen	5.5	Poor		5.00	Poor	Earthen
19+500	19+600	Hilly	Builtup	Chopapara	Bitumen	5.5	Fair		6.00	Poor	Earthen
19+600	19+700	Hilly	Builtup	Chopapara	Bitumen	5.5	Poor		7.00	Poor	Earthen
19+700	19+800	Hilly	Open	-	Bitumen	5.5	Poor		8.00	Poor	Earthen
19+800	19+900	Hilly	Open	-	Bitumen	5.5	Poor		9.00	Poor	Earthen
19+900	20+000	Hilly	Open	-	Bitumen	5.5	Poor		10.00	Poor	Earthen
20+000	20+100	Hilly	Open	-	Bitumen	5.5	Poor		11.00	Poor	Earthen
20+100	20+200	Hilly	Open	-	Bitumen	5.5	Poor		12.00	Poor	Earthen
20+200	20+300	Hilly	Open	-	Bitumen	5.5	Poor		13.00	Poor	Earthen

From Chainage 20+300 to 21+200

Chainage		Terrain	Adjacent Landuse Pattern	Village / Town Name	Carriageway			Shoulder			Drainage (Lined / Earthen)
From	To	Plain Rolling Hilly			Surface Type	Width (m)	Condition	Type	Width (m)	Condition	
20+300	20+400	Hilly	Open	-	Bitumen	5.5	Fair		14.00	Poor	Earthen
20+400	20+500	Hilly	Open	-	Bitumen	5.5	Fair		15.00	Poor	Earthen
20+500	20+600	Hilly	Open	-	Bitumen	5.5	Fair		16.00	Poor	Earthen
20+600	20+700	Hilly	Open	-	Bitumen	5.5	Fair		17.00	Poor	Earthen
20+700	20+800	Hilly	Open	-	Bitumen	5.5	Fair		18.00	Poor	Earthen
20+800	20+900	Hilly	Open	-	Bitumen	5.5	Fair		19.00	Poor	Earthen
20+900	21+000	Hilly	Open	-	Bitumen	5.5	Fair		20.00	Poor	Earthen
21+000	21+100	Hilly	Open	-	Bitumen	5.5	Poor		21.00	Poor	Earthen
21+100	21+200	Hilly	Open	-	Bitumen	5.5	Fair		22.00	Poor	Earthen
21+200	21+300	Hilly	Open	-	Bitumen	5.5	Poor		23.00	Poor	Earthen
21+300	21+400	Hilly	Open	-	Bitumen	5.5	Fair		24.00	Poor	Earthen
21+400	21+500	Hilly	Open	-	Bitumen	5.5	Fair		25.00	Poor	Earthen
21+500	21+600	Hilly	Open	-	Bitumen	5.5	Fair		26.00	Poor	Earthen

From Chainage 21+600 to 22+800

Chainage		Terrain	Adjacent Landuse Pattern	Village / Town Name	Carriageway			Shoulder			Drainage (Lined / Earthen)
From	To	Plain Rolling Hilly			Surface Type	Width (m)	Condition	Type	Width (m)	Condition	
21+600	21+700	Hilly	Open	-	Bitumen	5.5	Fair		27.00	Poor	Earthen
21+700	21+800	Hilly	Open	-	Bitumen	5.5	Fair		28.00	Poor	Earthen
21+800	21+900	Hilly	Open	-	Bitumen	5.5	Fair		29.00	Poor	Earthen
21+900	22+000	Hilly	Open	-	Bitumen	5.5	Fair		30.00	Poor	Earthen
22+000	22+100	Hilly	Open	-	Bitumen	5.5	Fair		31.00	Poor	Earthen
22+100	22+200	Hilly	Open	-	Bitumen	5.5	Fair		32.00	Poor	Earthen
22+200	22+300	Hilly	Open	-	Bitumen	5.5	Fair		33.00	Poor	Earthen
22+300	22+400	Hilly	Open	-	Bitumen	5.5	Poor		34.00	Poor	Earthen
22+400	22+500	Hilly	Open	-	Bitumen	5.5	Fair		35.00	Poor	Earthen
22+500	22+600	Hilly	Open	-	Bitumen	5.5	Fair		36.00	Poor	Earthen
22+600	22+700	Hilly	Open	-	Bitumen	5.5	Poor		37.00	Poor	Earthen
22+700	22+800	Hilly	Open	-	Bitumen	5.5	Poor		38.00	Poor	Earthen
22+800	22+900	Hilly	Open	-	Bitumen	5.5	Fair		39.00	Poor	Earthen

From Chainage 22+900 to 24+100

Chainage		Terrain	Adjacent Landuse Pattern	Village / Town Name	Carriageway			Shoulder			Drainage (Lined / Earthen)
From	To	Plain Rolling Hilly			Surface Type	Width (m)	Condition	Type	Width (m)	Condition	
22+900	23+000	Hilly	Open	-	Bitumen	5.5	Fair		40.00	Poor	Earthen
23+000	23+100	Hilly	Open	-	Bitumen	5.5	Fair		41.00	Poor	Earthen
23+100	23+200	Hilly	Builtup	Mebitpara	Bitumen	5.5	Fair		42.00	Poor	Earthen
23+200	23+300	Hilly	Builtup	Mebitpara	Bitumen	5.5	Fair		43.00	Poor	Earthen
23+300	23+400	Hilly	Builtup	Mebitpara	Bitumen	5.5	Fair		44.00	Poor	Earthen
23+400	23+500	Hilly	Open	-	Bitumen	5.5	Fair		45.00	Poor	Earthen
23+500	23+600	Hilly	Open	-	Bitumen	5.5	Fair		46.00	Poor	Earthen
23+600	23+700	Hilly	Open	-	Bitumen	5.5	Fair		47.00	Poor	Earthen
23+700	23+800	Hilly	Open	-	Bitumen	5.5	Fair		48.00	Poor	Earthen
23+800	23+900	Hilly	Open	-	Bitumen	5.5	Fair		49.00	Poor	Earthen
23+900	24+000	Hilly	Open	-	Bitumen	5.5	Fair		50.00	Poor	Earthen
24+000	24+100	Hilly	Open	-	Bitumen	5.5	Fair		51.00	Poor	Earthen
24+100	24+200	Hilly	Open	-	Bitumen	5.5	Fair		52.00	Poor	Earthen

From Chainage 25+500 to 26+700

Chainage		Terrain	Adjacent Landuse Pattern	Village / Town Name	Carriageway			Shoulder			Drainage (Lined / Earthen)
From	To	Plain Rolling Hilly			Surface Type	Width (m)	Condition	Type	Width (m)	Condition	
25+500	25+600	Hilly	Open	-	Bitumen	5.5	Fair		66.00	Poor	Earthen
25+600	25+700	Hilly	Open	-	Bitumen	5.5	Fair		67.00	Poor	Earthen
25+700	25+800	Hilly	Open	-	Bitumen	5.5	Fair		68.00	Poor	Earthen
25+800	25+900	Hilly	Open	-	Bitumen	5.5	Fair		69.00	Poor	Earthen
25+900	26+000	Hilly	Open	-	Bitumen	5.5	Poor		70.00	Poor	Earthen
26+000	26+100	Hilly	Open	-	Bitumen	5.5	Poor		71.00	Poor	Earthen
26+100	26+200	Hilly	Open	-	Bitumen	5.5	Fair		72.00	Poor	Earthen
26+200	26+300	Hilly	Open	-	Bitumen	5.5	Fair		73.00	Poor	Earthen
26+300	26+400	Hilly	Open	-	Bitumen	5.5	Fair		74.00	Poor	Earthen
26+400	26+500	Hilly	Open	-	Bitumen	5.5	Fair		75.00	Poor	Earthen
26+500	26+600	Hilly	Open	-	Bitumen	5.5	Fair		76.00	Poor	Earthen
26+600	26+700	Hilly	Open	-	Bitumen	5.5	Fair		77.00	Poor	Earthen
26+700	26+800	Hilly	Open	-	Bitumen	5.5	Fair		78.00	Poor	Earthen

From Chainage 26+700 to 28+000

Chainage		Terrain	Adjacent Landuse Pattern	Village / Town Name	Carriageway			Shoulder			Drainage (Lined / Earthen)
From	To	Plain Rolling Hilly			Surface Type	Width (m)	Condition	Type	Width (m)	Condition	
26+800	26+900	Hilly	Open	-	Bitumen	5.5	Fair		79.00	Poor	Earthen
26+900	27+000	Hilly	Builtup	Darong-Adu	Bitumen	5.5	Fair		80.00	Poor	Earthen
27+000	27+100	Hilly	Builtup	Darong-Adu	Bitumen	5.5	Fair		81.00	Poor	Earthen
27+100	27+200	Hilly	Builtup	Darong-Adu	Bitumen	5.5	Fair		82.00	Poor	Earthen
27+200	27+300	Hilly	Builtup	Darong-Adu	Bitumen	5.5	Fair		83.00	Poor	Earthen
27+300	27+400	Hilly	Builtup	Darong-Adu	Bitumen	5.5	Fair		84.00	Poor	Earthen
27+400	27+500	Hilly	Builtup	Darong-Adu	Bitumen	5.5	Fair		85.00	Poor	Earthen
27+500	27+600	Hilly	Builtup	Darong-Adu	Bitumen	5.5	Fair		86.00	Poor	Earthen
27+600	27+700	Hilly	Open	-	Bitumen	5.5	Poor		87.00	Poor	Earthen
27+700	27+800	Hilly	Open	-	Bitumen	5.5	Poor		88.00	Poor	Earthen
27+800	27+900	Hilly	Open	-	Bitumen	5.5	Poor		89.00	Poor	Earthen
27+900	28+000	Hilly	Open	-	Bitumen	5.5	Poor		90.00	Poor	Earthen
28+000	28+100	Hilly	Open	-	Bitumen	5.5	Poor		91.00	Poor	Earthen

From Chainage 28+100 to 28+158

Chainage		Terrain	Adjacent Landuse Pattern	Village / Town Name	Carriageway			Shoulder			Drainage (Lined / Earthen)
From	To	Plain Rolling Hilly			Surface Type	Width (m)	Condition	Type	Width (m)	Condition	
28+100	28+158	Hilly	Open	-	Bitumen	5.5	Poor		92.00	Poor	Earthen

Pavement Details:

For the MLCIP project, the pavement design adopts a multi-layered approach, utilizing materials of specified thicknesses to ensure durability and performance. The pavement layers consist of:

- Bituminous Concrete (BC): 30 mm
- Dense Bituminous Macadam (DBM): 70 mm
- Wet Mix Macadam (WMM): 250 mm
- Granular Sub-Base (GSB): 200 mm

This results in a total pavement thickness of 550 mm, providing a robust structure capable of withstanding diverse traffic loads and environmental conditions.

Details of the five different cross-sections, along with the chainage-wise designs adopted, are provided in **Annexure 3.1**. Design details are given in **Figure 3.5**.

Junctions Details:

The details of major and minor junctions are provided in **Table 3.3**.

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Table 3.3: List of Major and Minor Junctions of AP Road Section

S.No	Chainage	Type	Side	Direction	Type of Junction
1.	19+500	Y	LHS	Village	Minor
2.	23+400	Y	RHS	Village	Minor
3.	23+500	Y	RHS	Village	Minor
4.	23+600	T	LHS	Village	Minor
5.	23+700	Y	RHS	Village	Minor
6.	24+300	Y	LHS	Village	Minor
7.	24+900	Y	RHS	Village	Minor
8.	27+050	Y	LHS	Village	Minor
9.	27+150	T	RHS	Village	Minor
10.	28+158	T	End Point	SH-12	Major

3.4.2 PROPOSED ROAD CROSS SECTIONS

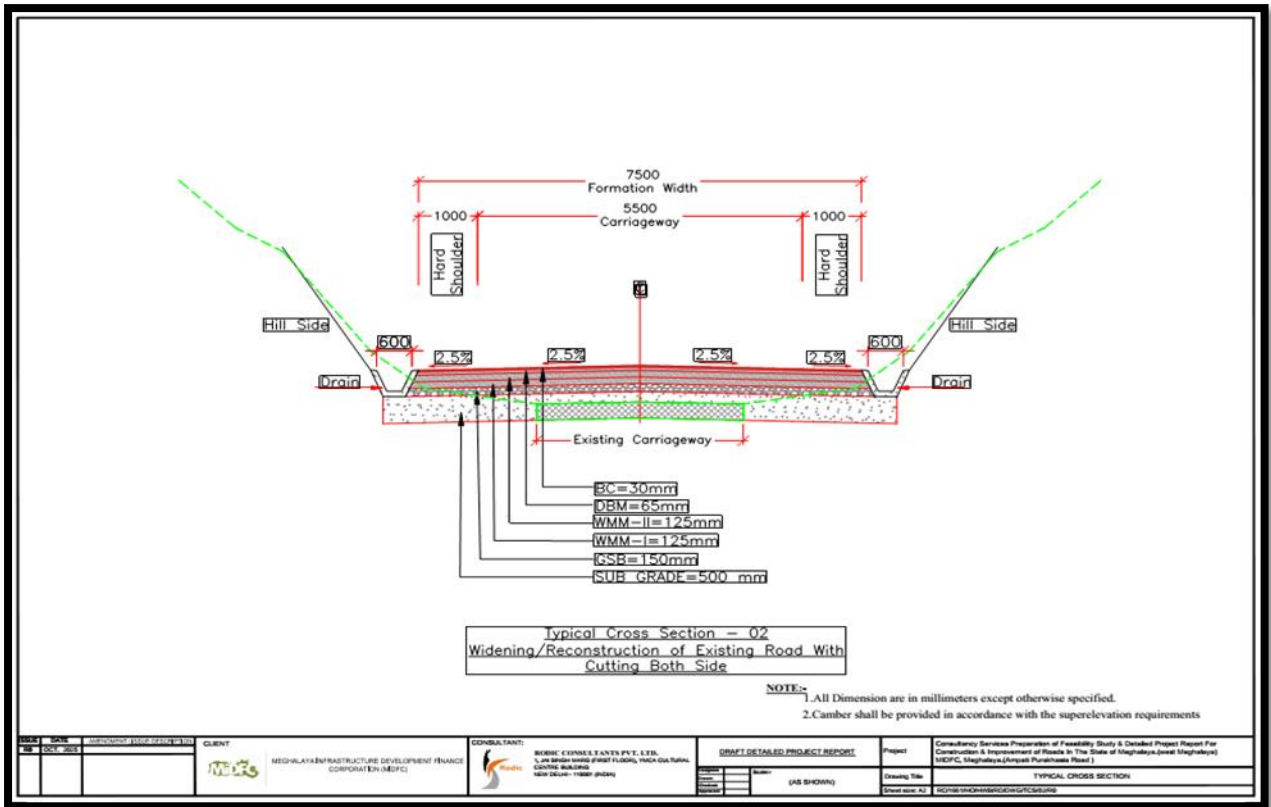
The Ampati to Purakhasia Road (AP) Road traverses gently undulating to moderately rolling terrain with elevations ranging from 50 m to 212 m amsl. The alignment largely follows the natural ground profile, requiring only localized earthwork. Minor cutting is needed between Chainage 21+200 to 21+300, where the road runs close to riverbanks and eroding slopes, necessitating bench cutting and slope protection such as gabion and retaining walls. Overall, the corridor requires moderate earthwork, with no major cutting, and incorporates suitable drainage and slope stabilization measures to ensure long-term stability and all-weather connectivity.

A total of 13 Typical Cross-Sections (TCS) have been proposed in the DPR (**Annexure 3.1**) for the 08 km road stretch. These TCSs vary, with some sections incorporating intermediate lanes, and are specifically designed to address the terrain and infrastructure requirements of the corridor, including provisions for road widening, slope stabilization, drainage, and utility corridors.

Based on these cross-sections, certain environmental and social impacts may arise, including additional land requirements, tree cutting, and disruption to local ecosystems, biodiversity loss, and alterations to the natural landscape

Details of the four different cross-sections, along with the chainage-wise designs adopted, are provided in **Annexure 3.1**. Design details are given in **Figure 3.5**.

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7500 Formation Width
5500 Carriageway
1000 Hard Shoulder
1000 Hard Shoulder
600 Parapet
2.5%
2.5%
Existing Carriageway
Weep Holes
Retaining Wall
Cement Stone Masonry (1:3)
SUB GRADE=500 mm
CSB=150mm
WMM-I=125mm
WMM-II=125mm
DBM=65mm
BC=30mm

Typical Cross Section - 03
Widening/ Reconstruction of Existing Road
With filling both Side

NOTE:-
1.All Dimension are in millimeters except otherwise specified.

DATE	REVISION	CLIENT	CONSULTANT	DRAFT DETAILED PROJECT REPORT	Project
01/01/2021	01	MEGHALAYA INFRASTRUCTURE DEVELOPMENT FINANCE CORPORATION (MIDFC)	ROBIC CONSULTANTS PVT. LTD. 7, Laxmi Nagar, 1st Floor, Thea Cultural Centre Building New Delhi - 110016 (INDIA)	(AS SHOWN)	Consultancy Services Preparation of Feasibility Study & Detailed Project Report For Construction & Improvement of Roads in The State of Meghalaya (erst Meghalaya) MIDFC, Meghalaya (Amphai Puranmaha Road)
					Drawing Title
					Sheet No. 42
					PROJECT NO. MEG/INF/2020/01/01/01

8500
Formation Width

Varies 1500 5500 Carriageway 1500 Varies

Footpath Cum Drain

Railing

2.5%

Existing Carriageway

RCC Drain

BC=30mm
DBM=65mm
WMM-II=125mm
WMM-I=125mm
GSB=150mm
SUB GRADE=500 mm

Typical Cross-Section - 04
Widening/Reconstruction of Existing Road in builtup
section with footpath cum drain both side

NOTE:-
1.All Dimension are in millimeters except otherwise specified.
2.Camber shall be provided in accordance with the superelevation requirements

DATE 10/01/2024	PROJECT MEGHALAYA INFRASTRUCTURE DEVELOPMENT FINANCE CORPORATION (MIDFC)	CONSULTANT RUDR CONSULTANTS PVT. LTD. 1, LINE ENGINEERING STREET T-10/10, WING CULTURAL CAPTIVE BUILDING NEW DELHI - 110001 (INDIA)	DRAFT DETAILED PROJECT REPORT	Project Consultancy Services Preparation of Feasibility Study & Detailed Project Report For Construction & Improvement of Roads in The State of Meghalaya (erst Meghalaya) MIDFC, Meghalaya (erst Meghalaya) (erst Meghalaya)
DATE 10/01/2024	CLIENT MEGHALAYA INFRASTRUCTURE DEVELOPMENT FINANCE CORPORATION (MIDFC)	CONSULTANT RUDR CONSULTANTS PVT. LTD. 1, LINE ENGINEERING STREET T-10/10, WING CULTURAL CAPTIVE BUILDING NEW DELHI - 110001 (INDIA)	Drawing Title (AS SHOWN)	Project Consultancy Services Preparation of Feasibility Study & Detailed Project Report For Construction & Improvement of Roads in The State of Meghalaya (erst Meghalaya) MIDFC, Meghalaya (erst Meghalaya) (erst Meghalaya)
			Drawing Title (AS SHOWN)	Project Consultancy Services Preparation of Feasibility Study & Detailed Project Report For Construction & Improvement of Roads in The State of Meghalaya (erst Meghalaya) MIDFC, Meghalaya (erst Meghalaya) (erst Meghalaya)
			Drawing Title (AS SHOWN)	Project Consultancy Services Preparation of Feasibility Study & Detailed Project Report For Construction & Improvement of Roads in The State of Meghalaya (erst Meghalaya) MIDFC, Meghalaya (erst Meghalaya) (erst Meghalaya)

3.4.3 SETTLEMENTS AND CORRIDOR CHARACTERISTICS

The AP Road passes through hilly terrain, rural settlements and towns. The details of the settlements along the stretch are presented in **Table 3.4** below.

Sl. No.	Chainage		Settlements
1	20+000	23+000	Chopapara (village)
2	23+000	26+000	Mebitpara (village)
3	26+000	27+000	Grazing Field
4	27+000	28+000	DarongAdu (village)

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3.4.3.2 Corridor Characteristics

The salient features of the AP road are summarized in **Table 3.5** below:

Table 3.5: Salient features of the AP Road

Sl. No.	Characteristics	8 km
1	Name of Road	Improvement of Ampati to Purakhasia Road (AP)
2	Project road corridor road Length	8 km (including approaches of Bridge)
3	District	South West Garo Hills
4	Villages/settlements enroute	03 villages
5	Terrain	Plain/Hilly/Rural
	Existing	The road is affected by various surface damages, including potholes, cracks, and other deterioration
6	Proposed treatment	Brownfield. Improvement of sharp curves within the RoW, reconstruction of weak and damaged/ new culverts and bridges, rehabilitation and strengthening of existing pavement to intermediate lane and protection works.
7	Bridges	No. of Major Bridge – 1 No. of Minor Bridges - 06
8	Junction	10
9	Culverts	45 Pipe culverts
10	Forests / environmentally sensitive areas	-
11	Religious Structures Affected	Nil
12	Impacted Structures (including Temporary Structures of NTHs)	05
13	Fifth/Sixth Scheduled Areas	Sixth Schedule Area
14	River crossings	Proposed road is crossing the Daru river
15	Water bodies / ponds	1 Daru River (25+000)
16	Sensitive receptors	2 School, 2 community hall, 1 power house office, 3 Churches in COI 50 m
17	Transshipment areas/truck parking locations	-
18	Other features / issues if any	-

3.4.4 TREES

The vegetation along the project road comprises a diverse mix of trees, shrubs, herbs, climbers, ferns, and grasses. Approximately 15 trees are likely to be impacted or require removal due to the proposed widening. Major trees impacted are Jackfruit, Mango, Arecanut, Bamboo, Sal. Neem, Peepal, Bargad , Guava, etc.

Table 3.6: Chainage wise list of Trees

S. No.	Chainage (km)	Common Name	Botanical Name	Girth at Breast Height (cm)	LHS/RHS
1	19+000	Bamboo (Clump)	<i>Bambusa vulgaris</i>	23	LHS
2	20+000	Arecanut Palm	<i>Areca catechu</i>	32	RHS
3	20+400	Jackfruit	<i>Artocarpus heterophyllus</i>	60	LHS

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4	21+200	Guava	<i>Psidium guajava</i>	44	RHS
5	22+600	Mango	<i>Mangifera indica</i>	85	LHS
6	23+000	Arecanut Palm	<i>Areca catechu</i>	28	RHS
7	24+300	Mango	<i>Mangifera indica</i>	83	LHS
8	25+000	Jackfruit	<i>Artocarpus heterophyllus</i>	90	RHS
9	25+800	Bamboo (Clump)	<i>Bambusa vulgaris</i>	81	LHS
10	26+000	Jackfruit	<i>Artocarpus heterophyllus</i>	74	RHS
11	26+550	Arecanut Palm	<i>Areca catechu</i>	35	LHS
12	26+900	Sal	<i>Shorea robusta</i>	81	RHS
13	27+350	Bargad (Banyan)	<i>Ficus benghalensis</i>	130	LHS
14	27+400	Neem	<i>Azadirachta indica</i>	80	RHS
15	28+000	Peepal	<i>Ficus religiosa</i>	115	LHS

Source: EIS Field Survey

To mitigate the ecological impact of tree loss, plantation at the ratio of 1:10 will be carried out. These mitigation measures, along with their implementation strategies, are comprehensively detailed in the Environmental and Social Management Plan (ESMP). The ESMP is attached as **Annexure 3.2**.

3.4.5 SLOPE PROTECTION WORKS

The project corridor in South West Garo Hills, Meghalaya, encounters significant challenges due to its rugged terrain, characterized by high hills and deep valleys. The topographic profile of the Ampati to Purakhasia Road (AP) indicates a gently undulating to moderately rolling terrain, with elevation ranging between 50 m and 212 m above mean sea level (amsl). The alignment traverses through shows three major elevation peaks and two depressions along the 08 km stretch, suggesting alternating cut and fill sections. The highest elevation zones occur near the mid and terminal sections of the corridor, whereas the lowest points are located in valley sections characterized by seasonal drainage or stream crossings. This topographical variation implies moderate earthwork requirements during construction, particularly in sections with steeper gradients. The general slope direction varies locally but follows the natural drainage. To address these issues, slope stabilization measures are essential to enhance the safety and resilience of the corridor, particularly given the district's susceptibility to landslides and the complexity of the topography. The sub-project proposes geotechnical solutions designed to stabilize both hillside cuts and valley-side slopes. The existing slopes along several chainages are steep and prone to erosion, especially near riverbanks, bridges, and sharp curves. Proposed measures include reducing slope angles to safer design values (1V:2H to 1V:3H) and providing protection such as stone pitching, gabion walls, toe walls, turfing, and river training works. These measures will improve long-term stability and protect nearby structures and settlements. Location wise slope protection works proposed along with project is given in **Table 3.7** below.

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Table 3.7: Slope protection works

Chainage (Km)	Side	Existing Angle (°)	Height of Cut (m)	Modified Angle of Repose (°)	Proposed Slope / Riverbank Protection
20+500	Both (riverbank)	60°	4.0 m	26.56° (1V:2H)	Stone pitching / gravity retaining wall with toe protection; vegetative slope dressing above pitching
21+200–21+300	LHS	55°	3.5 m	18.43° (1V:3H) — for long term slope stability	Gabion wall / revetment + local benching; toe riprap and geotextile; re-vegetation (bioengineering)
23+850	Both (near minor bridge abutment)	65°	5.0 m	26.56° (1V:2H) for immediate; 18.43° (1V:3H) if space permits	Apron protection, abutment slope strengthening, concrete/stone revetment, scour apron with filter layer
25+000	LHS	58°	3.0 m	26.56° (1V:2H)	River training works: localized bank stabilization, stone pitching, toe protection and geogrids
25+300	Both (curve near minor bridge)	50°	3.5 m	26.56° (1V:2H) or 21.80° (1V:2.5H) if adjacent settlement constraints require gentler slope	Toe wall + turfing; gabion toe + surface turfing; mattress & rock toe where flow exposure
27+460	Both (sharp curve near settlement)	55°	6.0 m	21.80° (1V:2.5H) — target for curve improvement; 26.56° (1V:2H) if reinforced	Curve radius improvement (cut & fill), flatten slopes (benching), retaining toe wall, geogrid/reinforced fill near settlement; monitoring & protective toe structure

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3.5 Components & Activities of the Proposed Project

The development of the road would necessarily entail the following three stages. Each of the stages would have several activities and sub-activities. The three stages are

3.5.1 DETAILED DESIGN AND PRE-CONSTRUCTION STAGE

- Carrying out ESIA studies & preparation of ESMP and other Environmental and Social management instruments such as RAP-IPDP, LMP, SEA/SH plan and OHS plan
- Finalization of alignment with incorporation of environmental, social and community concerns in addition to the design and safety aspects
- Relocation of utilities and private & community structures
- Community consultation for land identification for borrow areas, water availability, siting of camps, tree felling permission
- Identification of sources of material
- Contractor mobilization

3.5.2 CONSTRUCTION STAGE

- Site clearing & construction camp establishment
- Material procurement & transportation
- Earthwork, hillside cutting, if required, embankment construction, GSB, WBM, operation of equipment, plant and machinery
- Structure demolition & construction work, if required
- Surfacing and shoulder protection & road furniture

3.5.3 POST-CONSTRUCTION, OPERATIONS & MAINTENANCE STAGE

- Decommissioning of camp, removal of Construction & demolition waste
- Operation of vehicles and safety of road users

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3.6 Resource Requirements

The district of South West Garo Hills has come into existence in the year 2012 only. Details of construction material required for this project, their Source and Lead are given in **Table 3.8**

Table 3.8: Source , Quantity and Lead of Construction Materials

S. n o	Item	Unit	Qua ntity	Querry Name	Lead Km	APR Length		Total lead upto Plant
1	Fine Sand	cum	4,00	Tura Quarry	47	19.000	28.039	52
2	Coarse sand	cum	2,67	Tura Quarry	47	19.000	28.039	52
3	Agreegate	cum	33,2	Pipulbari quarry	53	19.000	28.039	58
4	Bitumin	MT	571	Guwahati IOCL refinery	292	19.000	28.039	297
5	Emulsion	MT	48	Haldia to Site	1180	19.000	28.039	1185
6	TMT Bars	MT	14	Guwahati SAIL	284	19.000	28.039	289
7	Cement	MT	405	Virgo Cement plant Damas	166	19.000	28.039	171
8	Water	KLD	22.9	Daru River				

(Source: DPR)

Assessing the availability of suitable construction materials near the project road is crucial for a road project. Surface water from the Daru river can be used for road construction with prior permission from the concerned Irrigation Department, South West Garo Hills District, Meghalaya.

3.6.1 VOLUME OF CIVIL WORKS

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The volume of civil works for MLCIP will be influenced by the type of construction methods, typical cross sections and specific materials used in the sub-project area. These civil works are essential for ensuring the highway's stability, safety and environmental sustainability thereby contributing to the long-term success of the road project. List of materials used such as Bituminous Concrete (BC), Dense Bituminous Macadam (DBM), Prime Coat (PC), Tack Coat (TC), Granular Sub Base (GSB), Wet Mix Macadam (WMM), and Shoulder treatments are included in the DPR. This comprehensive range of materials ensures the road's strength, durability and overall performance.

Based on the information provided in the DPR, the embankment protection measures are designed according to the height of the embankment to ensure slope stability and minimize erosion. For embankments having a height of less than 2.0 m, turfing with suitable grass species will be carried out on the side slopes to prevent soil erosion and maintain surface stability. For embankments with heights ranging between 2.0 m and 3.0 m, a toe wall is proposed at the base of the slope to provide additional structural support and prevent scouring at the toe. In cases where the embankment height exceeds 3.0 m, a retaining wall will be provided on the fill side to retain the earth mass, while a breast wall will be constructed on the cut side to support the excavated slope and prevent slope failure. These protective measures have been proposed as per standard engineering practices and IRC guidelines to ensure the durability and safety of the road embankment structure.

As per the earthwork estimation for the project corridor, the total fill quantity is 29111.61m³, and the cut quantity is 1234426.3 m³. After balancing cut and fill requirements, there remains a surplus of approximately 1205314.69 m³ of excavated material. This excess earthwork shall be disposed of or utilized by the contractor only at designated and pre-approved disposal sites identified by the Meghalaya Public Works Department (MPWD), in accordance with environmental management and safety norms.

Further, recycling and reuse of existing pavement materials shall be carried out as per MoRTH Specifications for Road and Bridge Works (latest revision) and IRC:120 guidelines. This approach promotes cut-and-fill optimization, reduces the requirement for fresh borrow materials, minimizes construction waste, and ensures compliance with the Solid Waste Management Rules, 2016 and Environmental (Protection) Act, 1986.

3.7 Land Requirements

No land is required for the road project, as most of the construction will be carried out entirely within the existing Right of Way (RoW) 12 m.

3.8 Water Requirements

The overall water requirement of the project is 22.911 KLD, of which 21.467 KLD will be used for construction activities and 1.444 KLD is required for domestic purposes. Details of Water requirement is given in Table 3.9.

Table 3.9: Water Requirement for Construction Works

Activity	Daily Demand (Liters/km)	Total for 8 km (Liters/day)	Remarks
Permanent Works	800 – 1000	6,400 – 8,000	Concrete mixing, compaction, culverts, drains.
Dust Suppression at Work Zone	300 – 500	2,400 – 4,000	Reduced due to frequent rain; use only on dry days.
Curing	300 – 500	2,400 – 4,000	Rainfall may assist, but controlled

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			curing still needed.
Laboratory	Fixed	356	Centralized testing facility.
Haul Roads	300 – 5600	2,911	Frequent spraying due to erosion-prone slopes.
Crusher	Fixed	3,156	For aggregate washing and dust control.
Plant Cleaning & Workshop Washing	Fixed	1,444	Includes batching plant and machinery.
Domestic Purpose	Fixed	1,444	For 35–50 workers (drinking, cooking, sanitation).
Total	—	≈ 22,911 Liters/day	—

3.9 Project Cost

The total estimated cost of the project is approximately 75.35 Crore.

3.10 Project Implementation Schedule

Based on the stipulated criteria and conditions, MPWD will award Civil Works to the eligible contractor. The contractor will own the responsibility of procuring the quality material in sufficient quantity from the nearest authorized source and approved manufacturers. Equipment of prescribed standards should be used by the contractor.

The manpower requirement would vary over the construction period depending on the quantum and type of work involved. The peak manpower requirement would be approximately 15. The skilled manpower, primarily the machine operators and concrete casting crew would be migrant labour and would be placed in the construction camp for accommodation purposes. On an average the crew in the construction camp at a time is likely to be around 6 persons. It is estimated that about 60 to 70% workers will be from local area. Remaining skilled workers, operators, supervisors and engineers may be from outside area. The manpower required for the work shall be mobilized by the contractors as per schedule. The project construction period for 08 km subproject stretch is considered as 24 months.

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4. BASELINE ENVIRONMENT

4.1 GENERAL

This chapter presents the existing environmental and social conditions of the AP road project area, compassing natural, physical, biological, cultural, and socio-economic components. Based on this baseline scenario, potential impacts of the proposed sub-project will be identified. The approach and methodology for baseline data collection are detailed in Section 1.3 of Chapter 1

4.2 Natural Environment (Meteorology)

This section describes the current meteorological conditions of the area, including climate, temperature, rainfall, and relative humidity.

4.2.1 CLIMATIC CONDITIONS

The climate in the project area is moderate and highly humid, with three distinct seasons: summer, rainy, and winter. The summer season occurs from March to May, followed by the southwest monsoon, which lasts until September. The winter season begins in November and continues through February.

4.2.2 TEMPERATURE

In South West Garo Hills, winter generally begins in mid-November, with January being the coldest month. During this period, maximum temperatures range from 24–26°C, while minimum temperatures can drop to 10–12°C. Summer starts in March, with July and August typically being the hottest months. During summer, maximum temperatures range between 30–33°C, and minimum temperatures are around 22–24°C. The monthly mean maximum and minimum temperatures for the nearest location, Shillong, as recorded by the India Meteorological Department (IMD), are presented in **Table 4.1**.

Table 4.1: Monthly Mean Maximum and Minimum Temperature

Month	Maximum Temperature in °C	Minimum Temperature in °C
January	24.5	12.5
February	25.0	13.0
March	30.0	18.0
April	31.0	20.5
May	32.5	22.0
June	31.5	23.5
July	33.0	25.0
August	32.8	25.2
September	32.0	24.0
October	30.5	21.5
November	28.5	17.0
December	25.5	13.5

Source: Climatological Table, 2020

Temperature Projection and Implications for AP Road

According to the Meghalaya State Action Plan on Climate Change (SAPCC, 2022), the South West Garo Hills region, including the Ampati–Purakhasia (AP) Road corridor, is projected to experience a rise in mean annual temperature of approximately 1.6–1.9°C by the mid-century period (2021–2050) relative to the 1975 baseline, based on the HadRM3 (PRECIS) regional climate model under the A1B scenario. This gradual warming is expected to increase surface heat exposure, particularly during the summer months,

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and lead to a higher frequency of hot days. For the AP Road, such temperature rise may accelerate softening of bituminous pavements, cause rutting and surface deformation, especially in exposed or low-lying segments. To enhance climate resilience, it is recommended to adopt higher performance grade or polymer-modified bitumen, ensure optimum pavement compaction during construction, and incorporate roadside vegetation or tree cover to reduce thermal stress. Integrating these measures into the road design and maintenance strategy will help mitigate the effects of projected warming and maintain long-term pavement performance.

4.2.3 RAINFALL AND HUMIDITY

South West Garo Hills experiences a subtropical monsoon climate with high humidity throughout the year. Pre-monsoon showers occur during April and May, often accompanied by thunderstorms and occasional hailstorms, followed by a brief dry spell. The southwest monsoon typically begins in late May or early June, with peak rainfall occurring between June and August. The hilly terrain, particularly in the southern and central parts of the district, receives the heaviest rainfall, which contributes to slope instability and increases the risk of landslides along the road corridor. The average annual rainfall during 2018-2020 is presented in **Table 4.2**, while **Table 4.3** provides the month-wise relative humidity for the year 2020 (nearest location: Shillong, IMD data).

Table 4.2: Last 3 years rainfall data for South West Garo Hills District

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Rainfall
2018	15.2	18.0	50.0	80.0	200.0	400.0	350.0	320.0	250.0	80.0	20.0	10.0	1,693.2
2019	10.0	12.0	40.0	90.0	310.0	380.0	370.0	300.0	240.0	100.0	15.0	5.0	1,872.0
2020	12.0	15.0	55.0	100.0	320.0	420.0	360.0	330.0	260.0	90.0	10.0	8.0	2,020.0

Source: Customized Rainfall Information System, Hydromet Division, IMD

Table 4.3: Month-wise Relative Humidity

Month	08.30 Hrs	17.30 Hrs
January	88	75
February	85	70
March	80	65
April	82	73
May	87	78
June	93	90
July	92	88
August	90	85
September	88	82
October	85	78
November	83	73
December	87	75

Rainfall Projection and Implications for AP Road

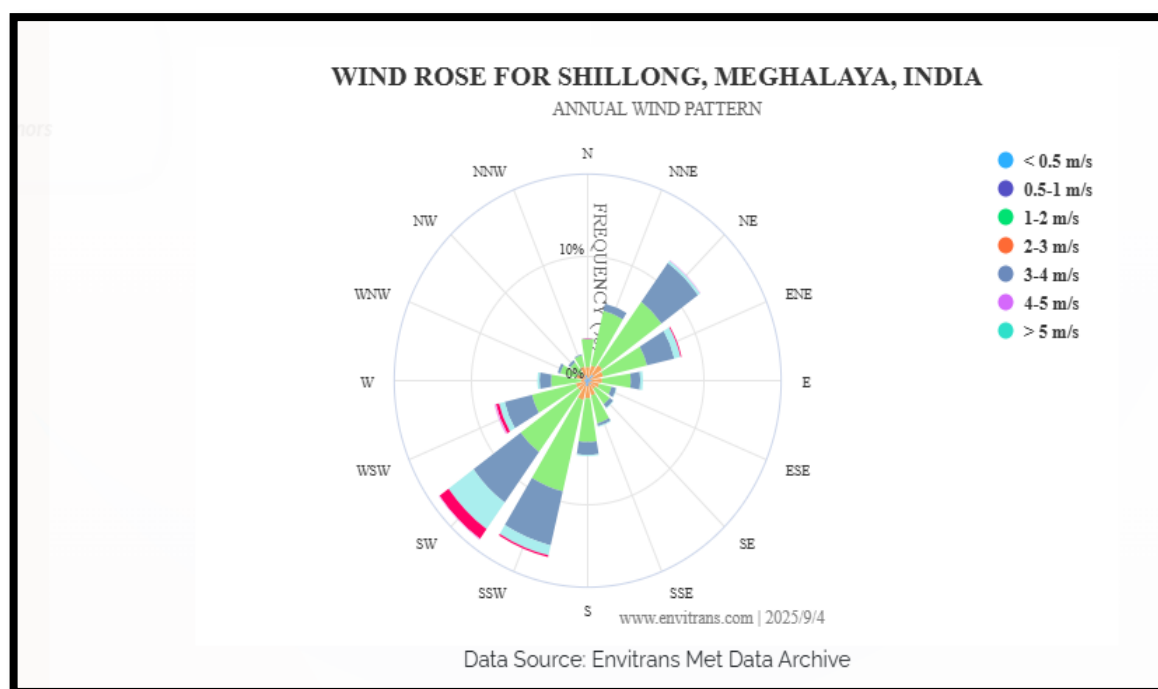
South West Garo Hills is expected to see an overall increase in annual rainfall, although the total rise is modest, around 0–5% by mid-century compared to the 1975 baseline, as per the SAPCC (2022). However, rainfall distribution is likely to become more erratic, with intense short-duration events and longer dry spells, particularly during the southwest monsoon (June to September). For the AP Road corridor, this change could increase surface runoff, soil erosion, and waterlogging, especially in hilly sections and low-lying areas. The risk of slope instability and localized landslides may also rise, given the combination of

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steep terrain and heavy rain events. To address these risks, the road design should incorporate adequate cross-drainage capacity, lined roadside drains, bioengineering measures for slope protection, and properly managed rainwater outlets. Regular maintenance of drainage infrastructure and embankments will be essential to ensure resilience against increased peak flows and to prevent erosion, flooding, and pavement damage during extreme rainfall events.

4.2.4 WIND SPEED AND DIRECTION

Wind Rose diagram was prepared for 1 year, for the wind data recorded at Shillong (nearest station taken) is given in **Figure 4.1**. Average Wind speed of 1.6 m/s in the direction of NE to South west is observed.



Source: Envitrans

Figure 4.1: Wind rose Diagram

4.3 Land Environment

4.3.1 PHYSIOGRAPHY AND ELEVATION

South West Garo Hills district, located in the western part of Meghalaya, is characterized by a predominantly hilly and undulating terrain forming part of the ancient Meghalaya Plateau. The district is bounded by Bangladesh to the south and west, while it shares its other boundaries with West Garo Hills and South Garo Hills districts. The landscape is composed of rolling hills, hillocks, and intervening valleys with elevations generally ranging between 100 meters and about 1,200 meters above mean sea level. The district is drained by several important rivers, including the Daru and Bhogai Rivers and tributaries of the Simsang River, drain the area, creating fertile valleys and wetlands that support agriculture and diverse aquatic habitats. The terrain's undulating nature, combined with rich forest cover and water bodies, significantly influences local climate, biodiversity, and land use patterns.

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Due to its location in the Seismic Zone V and the presence of fragile lateritic soils, the district is prone to erosion, landslides (in steeper pockets), and surface runoff during the monsoon. The physiographic setting thus creates a mosaic of hill slopes, forested ridges, fertile valleys, and low-lying plains that define the character of South-West Garo Hills.

As per elevation map of South West Garo Hills District, the AP project road stretch lies in the range of 50-212 m. The corridor wise elevation map of the project stretch is given in **Figure 4.2**.

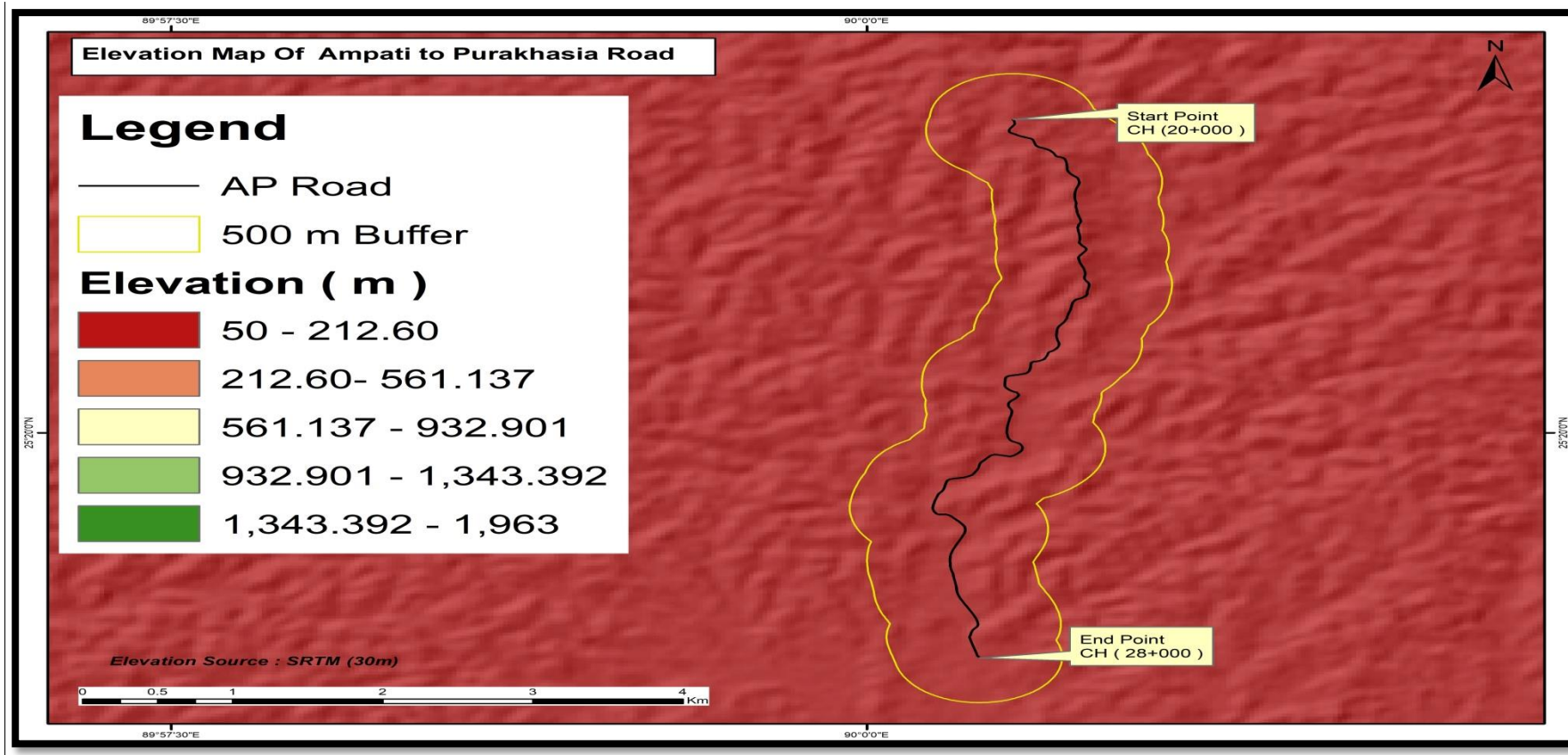


Figure 4.2: Elevation map of the AP project area (Elevation Source: SRTM (30m))

4.3.2 GEOLOGY

Geology of the Sub Project Road

- Dominated by Precambrian crystalline basement rocks (gneiss, granite, quartzite).
- Patches of Gondwana sediments with coal measures are found along valleys and river sections.
- Alluvial deposits occur in the plains.
- The terrain is rugged and hilly in the south, gently sloping towards the north.
- Economic geology: Small coal deposits (Siju–Dudnai belt), building stones, laterite, and minor limestone.

Seismicity

- Corridor lies in **Seismic Zone V** (IS 1893 zoning). Use **importance factor per IRC:6**; detail retaining walls, culverts, and bridges for seismic earth pressures and bearings for $PGA \approx 0.36 g$ design basis.

Environmental & construction notes

- **Monsoon window:** Avoid deep cuts/excavations Jun–Sep; stage construction with temporary drains & silt traps.
- **Spoil management:** Designated tips on stable benches (>10 m from drainage), compacted in layers, with toe bunds.
- **Biodiversity:** Riparian buffers at stream crossings; avoid borrow from natural slopes with dense canopy.

The geology of the AP Road is depicted in **Figure 4.3**, below.

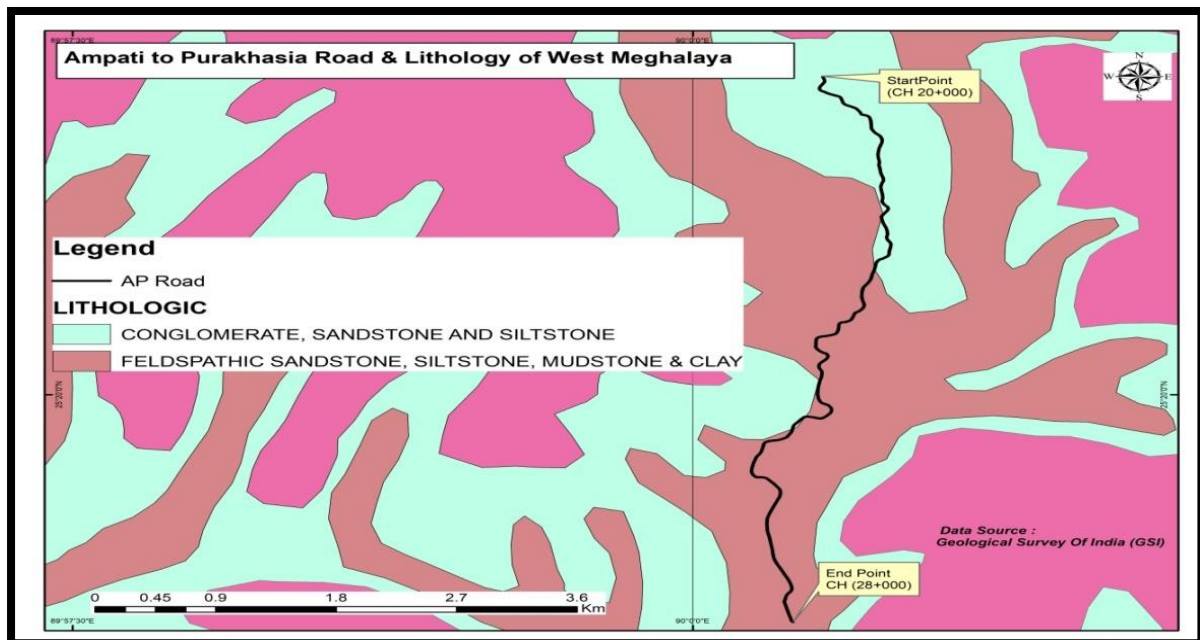


Figure 4.3: Local geology of the road stretch of Corridor 8

4.3.3 GEO-MORPHOLOGY AND SOILS

Soils along the project road are predominantly laterite and lateritic in nature, with high acidity as a defining characteristic. In the hilly sections, where the parent rocks weather slowly and are frequently subjected to heavy rainfall, soils tend to be more acidic compared to the relatively low-lying plains. Soil texture varies from sandy loam to clay loam, with patches of lateritic red soil. These soils are rich in organic matter and nitrogen due to their relatively undisturbed and virgin condition. However, lateritic soils are susceptible to erosion and leaching during intense monsoonal rainfall, which can lead to degradation and slope instability in certain sections of the road.

Geomorphological map of the Project Road is depicted in the **Figure 4.5** below.

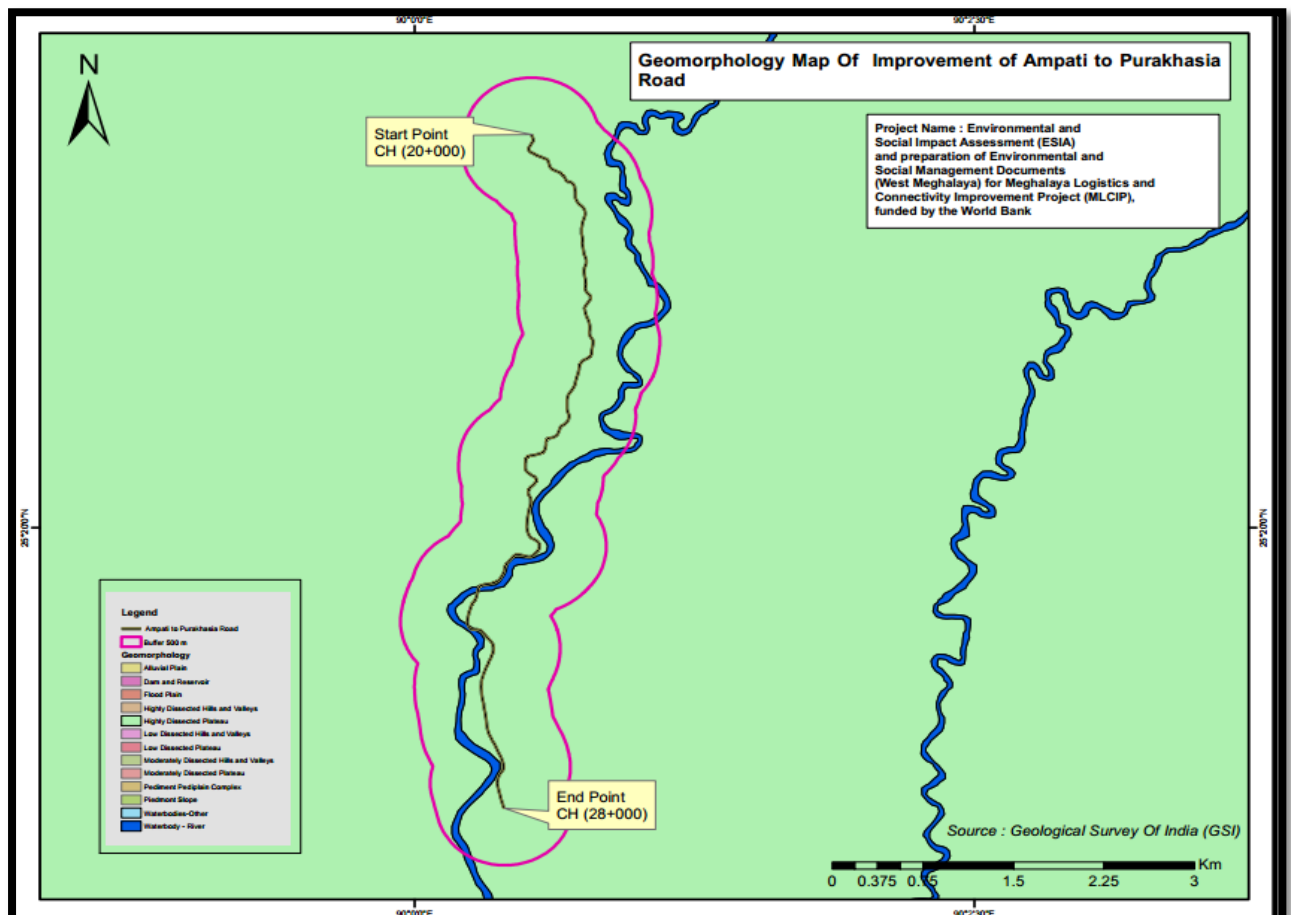


Figure 4.4: Geomorphological map of Project Road

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4.3.4 SOIL QUALITY

The soils of South West Garo Hills are mainly lateritic and shallow on the hill slopes, with alluvial pockets in the valley floors, and are widely reported to be acidic, non-saline and variable in fertility (pH, available P and K vary locally). Soil-fertility surveys and recent GIS mapping show a mosaic of soil conditions: many locations have reasonably high organic carbon because of forest and jhum fallows, but nutrient availability (especially phosphorus) is often low and soil pH commonly acidic conditions that limit crop response unless amended. (Mapping of soil fertility status of South West Garo hills district of Meghalaya, May 2020)

Where roads and settlements run for the Ampati–Purakhasia alignment, the soils along the corridor are frequently thin, weathered lateritic material on slopes with colluvial/alluvial deposits in drainage lines. These slope soils are prone to surface erosion and, under heavy monsoon rainfall, localized mass-movement and slope instability have been observed — a known risk for roadworks in the Garo Hills. (Central Ground Water Board, 2018-19).

The soil quality of South West Garo Hills, including the Ampati–Purakhasia Road corridor, is generally lateritic to sandy loam in texture, acidic in nature (pH 4.5–6.0), and moderate to low in fertility. The soils have good organic carbon content due to forest cover and shifting cultivation residues but are often deficient in available phosphorus and potassium. In valley areas, the soils are more fertile and deeper, while on hill slopes they are shallow, erodible, and prone to surface runoff during heavy rainfall. Overall, the soils support forest and plantation crops well but require lime application, organic manure, and soil conservation measures for sustainable agricultural use and to maintain stability along the road alignment. (Source: National Bureau of Soil Survey and Land Use Planning (NBSS&LUP), ICAR – *Soil Series of Meghalaya* (NBSS Publication No. 141, 2017)

Practical implications: (1) agricultural improvement needs lime (to reduce acidity), targeted P and K fertilization and organic-matter management; (2) watershed and slope-stabilization measures (contour bunding, vegetative check-dams, bio-engineering) are important to reduce erosion and landslide risk along hill roads; and (3) any earthworks on the Ampati–Purakhasia route should be preceded by site-specific geotechnical and soil investigations (borrow-area assessment, topsoil preservation, cut-slope stabilization) rather than relying on regional maps alone.

Soil monitoring was conducted at 02 Locations in the month of October. Details of the soil sampling locations are presented in Table 1 & figure 1 of Annexure 4.4. The collected soil samples were analyzed for various parameters in an NABL-accredited laboratory. The soil monitoring results are presented in Table 2 of Annexure 4.4. The soil quality at both sampling locations (SQ1 and SQ2) indicates sandy loam texture with good organic matter content (≈3.3–3.5%), mildly acidic pH (≈5.9), and moderate levels of primary nutrients (N, P, K). Heavy metal concentrations are low and within normal background levels, indicating no contamination concerns.

4.4 Water Environment

4.4.1 HYDROGEOLOGY OF SOUTH WEST GARO HILLS

The hydrogeology of South West Garo Hills District is influenced by its hilly terrain and the underlying geological formations that predominantly consist of Precambrian crystalline rocks, including gneisses, schists, and granites. These rocks are often fractured and weathered, which allows for limited

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groundwater storage in the form of shallow aquifers that are confined mainly to weathered zones and fracture systems.

The groundwater occurrence in this district is discontinuous, with localized availability primarily in valley fills and alluvial deposits. The depth to groundwater typically ranges from 10 to 35 meters below ground level (bgl) in areas with more weathered and fractured rock formations. Groundwater recharge mainly occurs during the monsoon season, where rainfall infiltrates these weathered zones. Shallow wells and springs serve as the primary sources of drinking water for rural communities in South West Garo Hills. These springs, often found in the foothills or along the slopes, provide a crucial water source for agricultural and domestic use, particularly during the monsoon and post-monsoon periods.

The overall groundwater potential in South West Garo Hills is generally moderate to low, with the highest potential in valley fills or along major riverbeds where alluvial deposits allow for better groundwater storage. The district's reliance on surface water sources, including rivers, streams, and springs, remains high, as large-scale groundwater extraction is limited due to the rugged terrain and the relatively low yields from the aquifers.

To conclude, South West Garo Hills's hydrogeology is primarily controlled by its rock formations, the weathering profile, and the distribution of fractures, with moderate groundwater availability in specific localized areas. Surface water sources, such as streams and springs, remain more significant for the district's water supply.

The hydrogeological map of South West Garo Hills district is given in below **Figure 4.7**.

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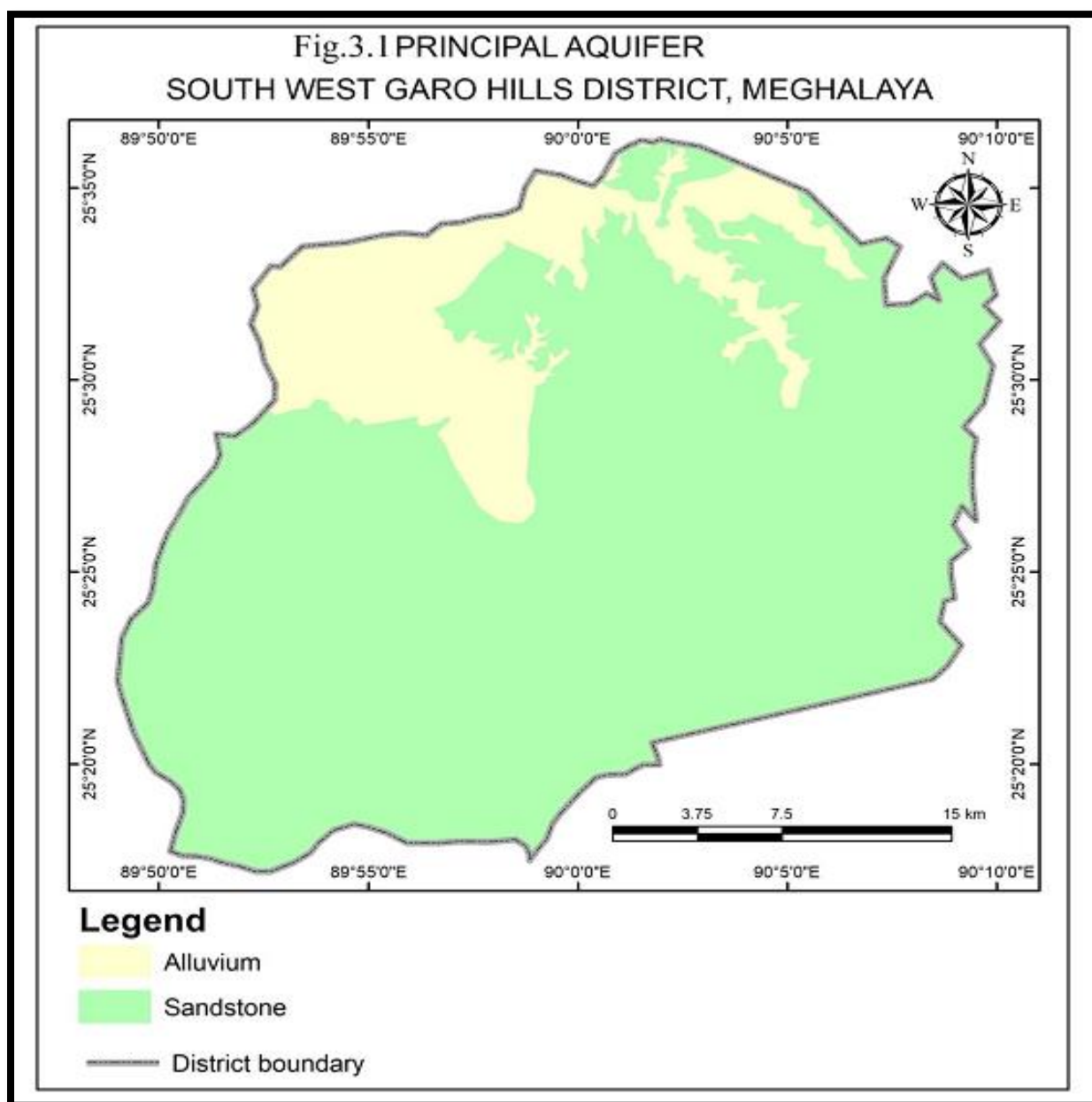


Figure 4.5: Hydrogeological map of South West Garo Hills district (Source: CGW, 2020)

Water bodies in the AP project area of 8 kms stretch are mainly Daru River, was observed during the field study. Several small perennial and seasonal streams intersect or run adjacent to the Ampati to Purakhasia (AP) Road corridor in South West Garo Hills District. These streams serve as vital sources of domestic water, livelihood support for nearby communities, and ecosystem linkages within the local drainage network. Local villages use the stream water primarily for washing, bathing, small-scale irrigation, and livestock watering, particularly during the dry months when groundwater availability is low. In some sections, community fish rearing and bamboo growth are also supported by these watercourses. The streams contribute to local groundwater recharge and wetland formation, enhancing biodiversity along riparian stretches. However, unregulated runoff from roads and nearby settlements occasionally leads to siltation and turbidity, affecting water quality and downstream use. The project design therefore emphasizes protection of natural flow channels, provision of cross-drainage structures, and controlled

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discharge of construction runoff to prevent any disruption or contamination of these locally significant water bodies. The below section describes the Surface and Ground water conditions in the sub-project area as well as the relevant water quality standards.

4.4.2 SURFACE WATER

The water quality status (WQS) of surface water in South West Garo Hills is excellent, as revealed by a study conducted by MSPCB. The analysis of 13 environmental water variables showed that the WQS was better in the midstream and downstream sites compared to the upstream sites across all seasons, except during the monsoon. According to secondary data, pH of the surface water ranges from 7.0 to 7.65 which results alkaline in nature. Surface water quality in general in the project corridor complies with CPCB surface water quality standards of classification norms for Class C-Drinking water source after conventional treatment and disinfection.

01 Surface water samples have been selected from sources present along the project roads to ascertain the baseline conditions of the surface water quality. The surface water samples collected included samples from river in the month of October. Location details of the surface water samples are presented Table 3 Figure 2 of Annexure 4.4. Results of the Surface water quality are shown in Table 4 of Annexure 4.4.

The water quality at location SW-1 meets IS:2296 Class-C standards, with good DO (7.35 mg/L), low BOD (5.6 mg/L), and acceptable pH (7.32). Major ions, nutrients, and heavy metals are within permissible limits, indicating clean surface water suitable for propagation of fisheries and recreational uses.

4.4.3 GROUND WATER

As per the Central Ground Water Board (CGWB)'s Annual Groundwater Quality Report 2024, the groundwater quality in Meghalaya, including areas like Gambegre Development Block, is generally safe for drinking and agricultural use. The report, based on analysis from 15,259 monitoring locations across India, indicates that 100% of the groundwater samples from Meghalaya met the Bureau of Indian Standards (BIS) drinking water quality norms.

The parameters assessed include Electrical Conductivity (EC), Fluoride, Arsenic, Nitrate, and heavy metals. In Meghalaya, the groundwater samples showed no exceedance of permissible limits for these parameters, suggesting that the groundwater is chemically safe for consumption and irrigation. This is consistent with the state's overall groundwater quality, which is among the best in the country.²

02 Ground water samples have been selected from sources present along the project roads to ascertain the baseline conditions of the ground water quality. The Ground water samples collected included samples in the month of October. Location details of the surface water samples are presented in Table 5 and shown in Figure 3 of Annexure 4.4. Results of the Surface water quality are shown in Table 6 of Annexure 4.4.

Groundwater at both locations (GW-1 and GW-2) shows good potability, with pH ranging from 7.30–7.33, TDS 238–241 mg/L, and total hardness around 121–123 mg/L, all well within IS 10500:2012 limits. Heavy

² Ground Water Information Booklet South West Garo Hills Hills

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metals like iron, chromium, arsenic, lead, cadmium, and mercury are below detectable or permissible levels, indicating no contamination risk. Overall, the groundwater quality is satisfactory and safely fit for drinking and domestic use.

4.5 Air Environment

4.5.1 AIR QUALITY

This section presents the relevant air quality standards and the existing ambient air quality conditions. Ambient Air Quality Monitoring Standards (NAAQ Standards) is presented in **Table 4.4**.

Table 4.4: National Ambient Air Quality Monitoring Standards (NAAQ Standards)

Parameter (In $\mu\text{g}/\text{m}^3$)	Time weighted average	NAAQ standard
Particulate matter (PM_{10})	24 hrs.	100
Particulate matter ($\text{PM}_{2.5}$)	24 hrs.	60
Sulphur dioxide (SO_2)	24 hrs.	80
Nitrogen oxide (NO_2)	24 hrs.	80
Carbon monoxide (CO)	8 hrs.	2000

NAAQ – National Ambient Air Quality Standards

The Project has the potential to impact air quality, and while these impacts can be managed through mitigation measures outlined in the ESMP and adherence to good international practices, there remains a possibility of significant residual impacts. Therefore, a detailed assessment of air quality is included and scoped within the ESIA Report.

Residential and other sensitive locations proximity to roads were the criteria used for selecting the sample locations (Table 7 and Figure 4 of Annexure 4.4). 03 locations were selected for air quality monitoring. Monitoring was done in the month of October. Parameters like Particulate Matter (PM_{10}), Particulate Matter ($\text{PM}_{2.5}$), Sulphur dioxide (SO_2), Nitrogen dioxide (NO_2) and Carbon Monoxide (CO) were monitored. Map showing monitoring locations are given in Figure 4. Ambient air quality results are given in Table 8 of Annexure 4.4.

The monitored air quality data shows that overall pollution levels in the project area are within the National Ambient Air Quality Standards (NAAQS). PM_{10} concentrations range between 41.3–42.6 $\mu\text{g}/\text{m}^3$ and $\text{PM}_{2.5}$ between 16.9–18.4 $\mu\text{g}/\text{m}^3$, both well below their respective limits, indicating low particulate pollution. Sulphur dioxide (SO_2) levels remain low, between 5.2–5.7 $\mu\text{g}/\text{m}^3$, suggesting minimal sulfur-based emissions. Nitrogen dioxide (NO_2) values mostly lie in the lower range of 5.6–5.9 $\mu\text{g}/\text{m}^3$, though one location recorded a comparatively higher value of 56.3 $\mu\text{g}/\text{m}^3$, which is still within the permissible limit, may reflect localized emission sources such as vehicular movement or fuel combustion. Carbon monoxide (CO) concentrations, ranging from 0.190–0.210 mg/m^3 , also remain significantly lower than the prescribed limit, indicating negligible CO-related pollution in the area. Overall, the data suggests that ambient air quality in the monitored corridor is generally clean and does not pose environmental or public health concerns.

These favorable conditions are attributed to the region's low industrial activity, limited vehicular emissions, and abundant green cover, which collectively contribute to maintaining good air quality. However, it's important to note that air quality can vary with seasonal changes and local activities, so ongoing monitoring is essential to ensure continued public health safety.

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4.6 Noise Environment

The principal sources of construction noise and vibration anticipated during the Project include:

- Delivery and movement of staff, materials, construction plant, and machinery;
- Site preparation works, including establishment of construction camps;
- Hill cutting and excavation activities;
- Removal of existing road pavement and structures; and
- Restoration and finishing works.

Most of these activities are expected to occur in proximity to the existing road alignment. Night-time construction is not generally proposed, except under special circumstances where continuity of work is essential (e.g., critical traffic management needs or safety considerations).

The assessment of construction noise has been included in the ESIA Report, as noise generated from project activities is expected to be continuous.

To compute the average Noise Level dB (A), noise level is monitored over a period of 24 hour by the authorized NABL laboratory. The noise monitoring has been conducted for determination of noise levels at 03 locations for (Figure 5 of annexure 4.4) in the month of October as per Table 8 of Annexure 4.4. Monitoring results are given in Table 10 of Annexure 4.4.

The noise monitoring results indicate that the ambient noise levels in all three monitored locations are well within the permissible limits prescribed for rural and residential areas. During daytime, the equivalent noise levels range between 40–45 dB(A), with the highest value observed at Mebitpara Village Market due to routine commercial and traffic activities. Night-time noise levels are comparatively lower, ranging between 30–33 dB(A), reflecting minimal human or vehicular activity during late hours. Overall, the observed day and night noise levels at Chopapara Village, Mebitpara Village Market, and Mebitpara Village fall within acceptable standards and do not pose any significant noise pollution concerns for local communities.

Noise barriers are not required along the Ampati road as the surrounding area is predominantly rural with low population density, resulting in minimal noise-sensitive receptors. The monitored ambient noise levels are well within permissible limits during both day and night, indicating no significant noise impact that would justify installation of barriers.

4.7 Biological Environment

4.7.1 BIODIVERSITY IN EAST and GARO HILLS DISTRICT

Along the roadside, common plantation trees include Jackfruit, Arecanut etc. In some stretches, Banana, Bamboo, and Betel Nut palms are also planted by villagers. Shrubs commonly observed include Lantana, Eupatorium, Hibiscus, Clerodendrum, and various Bamboo plants. In moist patches, ferns and thickets of Ardisia and Strobilanthes are also common. Common herbs along the roadside include grasses Mint, Wild Ginger, Turmeric, Broom grass etc.

A primary biodiversity survey was conducted during the field visit in August 2025. The survey recorded a total of 118 species of flora and 10 species of aquatic biodiversity, comprising 62 tree species, 8 shrubs,

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21 herbs, 10 ferns, and 7 grass species. In addition, 8 mammal species, 45 bird species, 6 reptile species, 2 amphibian species, 25 butterfly species, and 10 fish species were documented.. The methodology adopted for biodiversity assessment is attached as **Annexure 4.1**.

Detailed list of flora, fauna, and aquatic biodiversity, along with their conservation status, is provided in **Annexure 4.2**.

During the field survey and consultations with local communities and forest department officials, no evidence of wild animal hunting was recorded within the Direct Impact area of the Project road corridor roads. However, improved connectivity after construction may increase the risk of hunting and illegal wildlife trade

In the South West Garo Hills of Meghalaya, traditional medicine remains central to primary healthcare among Garo communities, and alongside plants, animal by-products are also used for zoo therapeutic remedies. While detailed, district-wide inventories are still scarce, evidence from the Garo Hills and neighboring Northeast India indicates that a variety of wild species are targeted for medicinal use and bushmeat, with pangolins and primates among the species of concern. Robust, site-level documentation from South West Garo Hills is still limited, underscoring the need for focused surveys to map hunting hotspots and species affected within the district.

Given these findings, our study underscores the importance of conservation-driven infrastructure planning, ensuring that developmental activities in South West Garo Hills align with ecological sustainability and biodiversity protection. The following sections provide a detailed breakdown of the biodiversity recorded, emphasizing species conservation status and the ecological significance of different taxonomic groups

4.7.2 BIODIVERSITY AND CRITICAL HABITAT IN SUB-PROJECT STRETCH PIA

The biodiversity within 10 km radius of the AP Roads corridor-wise (refer to Section 3.3 on PIA) were studied based on the secondary sources followed by primary data collection in the direct impact area and presented in **Figure 3.2** in Chapter 3.

Project Influence Area (Within 10 km):

Critical habitat assessment was conducted based on the “Critical Habitat” criteria outlined by World Bank’s ESF (ESS 1 & 6). The details of the presence of critical habitat within PIA are summarized in **Table 4.5**.

Table 4.5: Biodiversity and critical habitat assessment-based on field survey and GIS analysis for the Direct Impact Area (500 m buffer)

Sl. No.	Habitat (includes natural or modified)	Observation	Remarks
I.	(a) Habitats protected by national and state legal regulations		
	(i) PAs - Wildlife Sanctuary, National Park, conservation reserve or community reserve, Tiger reserve and corridor and Eco-sensitive zone (As notified under the	Not present	-

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Sl. No.	Habitat (includes natural or modified)	Observation	Remarks
	Wildlife Protection Act, 1972)		
	(ii) Reserve Forest (As notified under India Forest Act, 1927)	Not present	-
	(iii) Protected wetland of Meghalaya	Not Present	Nil
II.	b) Habitat of significant importance to Critically Endangered or Endangered species		
	(i) Species listed under Schedule I of the Wildlife (Protection) Act, 2022	Not Present	Schedule I species are not observed during the field survey.
	(ii) Species listed under Schedule III of the Wildlife (Protection) Act, 2022	Not present	Schedule III species are not observed during the field survey
	(ii) Species notified as "threatened species" by the Govt. of Meghalaya under the Meghalaya Biodiversity Rules 2010	Not Present	"Threatened species" are not observed during the field survey.
	(iii) Critically Endangered/Endangered species as listed by the IUCN Red List of Threatened species	Not Present	Critically Endangered/Endangered species are observed during the field survey.
III.	c) Habitats of significant importance to endemic or restricted-range species d) Habitats that support globally or nationally significant concentrations of migratory or congregatory species e) Highly threatened or unique ecosystems		
	(i) Biosphere Reserve (Core Area)	Not present	No Govt. notified Biosphere Reserve
	(ii) Ramsar Site	Not present	Nil
	(iii) Important fish & Key Biodiversity Area	Yes, present	<ul style="list-style-type: none"> Daru River @ chainage 25+000. <p><i>The Daru River and adjoining water bodies in South West Garo Hills support a diverse freshwater fish community, including economically and ecologically important species such as carps (Labeo rohita, Catla catla), barbs (Puntius sophore, Raiamas bola), and native species like the Garo Stone Loach (Aborichthys garoensis) and Garo Spineless Eel</i></p>

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Sl. No.	Habitat (includes natural or modified)	Observation	Remarks
			<i>(Garo khajurjai)</i> . These species inhabit a range of environments, from fast-flowing hill streams to rivers, ponds, and reservoirs, and are currently classified as Least Concern in terms of conservation status
	(iv) Habitat of Appendix I – Endangered migratory species as per the Convention on the Conservation of Migratory Species (CMS)	Not present	No such species were observed during the field survey. A total of 05 species are listed under Schedule I of the Wildlife Protection Act, 2022. Although none of these species were recorded during the field surveys conducted in the 10 km study area, their presence has been indicated through secondary information sourced from the IBAT Tool.
	(v) Notified Elephant Reserve and Corridor	Not present	No Govt. notified Elephant reserve and corridor present
	(vi) Natural habitats	Not Present	The habitats in the project area are modified for agricultural purposes, and the degraded forest is primarily dominated by bamboo species, Banana and Arecanut.

4.7.3 SUMMARY OF BIODIVERSITY ASSESSMENT AND RISKS

Most of the flora and fauna present within the Direct Impact Area fall under the Least Concern category as per the IUCN Red List of Threatened Species (IUCN, 2024) and are not included in Schedule I or Schedule III of the Wildlife Protection Act, 2022. A total of 05 species are listed under Schedule I of the Wildlife Protection Act, 2022. Although none of these species were recorded during the field surveys conducted in the study area, their presence has been indicated through secondary information sourced from the IBAT Tool.

Field surveys, consultations with local communities, and studies by the Forest Department indicate the absence of critical habitats, endangered fauna, or hunting threats within the Direct Impact Area.

4.8 Socio Economic Environment

The baseline study assessed the socio-economic profile of households and families within the Project Influence Area that may be affected by the project. The assessment covered various parameters, including education levels, ethnicity, religion, sources of livelihood, and income levels of the affected families.

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The proposed project site is located in the South West Garo Hills District of Meghalaya. Established in 2012 from the erstwhile West Garo Hills, the district covers an area of approximately 822 sq. km, with its administrative headquarters at Ampati. The District is bounded by Assam and West Garo Hills District on the North, Bangladesh on the South, West Garo Hills District on the East, and Assam and Bangladesh on the West.

Government and Administration: South West Garo Hills is administered under the Government of Meghalaya and operates in accordance with the provisions of the Sixth Schedule of the Indian Constitution. This empowers the Garo Hills Autonomous District Council (GHADC) to manage matters related to land, forests, and customary practices, while law enforcement and other major state functions remain under the purview of the Meghalaya Government. The district is divided into four Community and Rural Development (C&RD) Blocks, including Betasing, Purakhasia, Rerapara and Zikzak. The administrative headquarters is located at Ampati, which also serves as the main center for governance and coordination of developmental activities.

4.8.1 SOCIO-ECONOMIC PROFILE OF THE PROJECT ROADS

The socio-economic details of the AP Roads are discussed below. The methodology for data collection is detailed in section 1.3 of Chapter 1.

4.8.2 DEMOGRAPHY

4.8.2.1 POPULATION

The project corridor includes smaller rural settlements such as Chopapara (192), which have significantly lower populations. Gender distribution is generally balanced, although some areas—such as DarongAdu have more females than males. Larger settlements like DarongAdu (744) play a key role in the region's demographics, reflecting the varied population density across the corridor. The population distribution of the sub-project affected villages is presented in **Table 4.6**.

Table 4-6: Population distribution of the sub-project affected villages

Village Name	Total Population		
	Male	Female	Total
Chopapara	98	94	192
Mebitpara	136	122	258
DarongAdu	369	375	744

Source: Census 2011

4.8.2.2 SEX RATIO

In Corridor 8, the sex ratio varies notably across villages Chopapara has a sex ratio of 959 females per 1,000 males, while Darong Adu shows a higher ratio of 1,016. In contrast, Mebitpara reflects a lower sex ratio of 897, indicating a gender imbalance. Detailed sex ratio data for the project-affected villages and two towns are presented in **Table 4.7**.

Table 4-7: Sex ratio of the sub-project affected villages

Village Name	Sex Ratio
Chopapara	959
Mebitpara	897
DarongAdu	1016

Source: Census 2011

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4.8.2.3 SCHEDULED TRIBE POPULATION

The district is predominantly inhabited by the Scheduled Tribe (ST) population. Their settlements along the project road corridor are primarily concentrated in smaller rural villages, with DarongAdu (719) recording the highest ST populations. In contrast, smaller village like Chopapara (189) have comparatively lower ST populations. Gender distribution is generally balanced, although some areas—such as DarongAdu (364), have more females than males. A detailed distribution of the ST population along the project corridor is provided in **Table 4.8**.

Table 4-8: Population distribution of the sub-project affected villages

ST Population				Percentage
Village Name	Male	Female	Total	
Chopapara	96	93	189	98.4
Mebitpara	135	121	256	99.2
Darong Adu	355	364	719	96.6

Source: Census 2011

4.8.2.4 WORKFORCE POPULATION

The workforce distribution in the region highlights rural areas like Darong Adu (246 workers) as economic hubs, with strong female participation in Chopapara (94). The detailed workforce of the project affected villages is given in **Table 4.9**.

Table 4-9: Workforce Population in the Project road corridor area

Area	Main Workers (No.)			Marginal Workers (No.)			Total Workforce (No.)			Percentage
	Male	Female	Total	Male	Female	Total	Male	Female	Total	
Chopapara	46	47	93	0	1	1	46	48	94	48.9
Mebitpara	48	25	73	8	15	23	56	40	96	37.2
Darong Adu	127	101	228	2	16	18	129	117	246	33.0

Source: Census 2011

4.8.3 EDUCATION

The educational scenario in the project corridor reveals notable variations in literacy levels across rural areas. Darong Adu lead in literacy rates, while village like Chopapara show minimal literacy levels.

The detailed distribution of literate and illiterate populations in the sub-project affected villages is provided in **Tables 4-10**.

Table 4-10: Literate Population in the Project road corridor area

Literate Population				
Village Name	Male	Female	Total	Percentage

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Literate Population				
Village Name	Male	Female	Total	Percentage
Chopapara	43	20	63	32.8
Mebitpara	98	71	169	65.5
Darong Adu	286	275	561	75.4

Source: Census 2011

4.8.4 WAGES AND BENEFITS

Public consultations with local communities revealed that wages in the project area are lower than in urban centers, and workers often do not receive benefits such as healthcare, pensions, or paid leave. According to the Department of Rural Development (2023–24), the notified wage rate for unskilled labor in these corridors is Rs. 541, as per the latest Meghalaya notification effective from 1 April 2025 (dated 21st July 2025). While the lower cost of living partially offsets these lower wages, achieving financial stability remains a challenge for many workers.

4.8.5 SEASONAL EMPLOYMENT

Along the AP road, the settlement area has recently gained popularity as a tourist destination. A significant portion of the population depends on agriculture and allied activities. As most employment opportunities are seasonal, many workers experience periods of unemployment or underemployment outside peak farming seasons, which affects their income stability and financial security.

4.8.6 POVERTY

In Sub project road, poverty rates are higher in rural areas compared to urban centers. Households in remote villages, where road connectivity is still developing, largely depend on subsistence farming. Limited access to markets, credit, and financial services further constrains their economic opportunities, contributing to the higher prevalence of poverty in these areas.

4.8.7 SOCIAL VULNERABILITIES

4.8.7.1 MIGRATION

Consultations with villagers indicate that residents prefer to remain within their local areas, primarily engaging in agriculture and commercial activities within their villages. Migration to other locations is uncommon, as most people choose to sustain their livelihoods locally.

4.8.7.2 CRIME

In Sub project road, most disputes in the villages are resolved locally through traditional mechanisms, with the Nokma (village headman) playing a central role in dispute resolution. Only cases that cannot be settled at the community level or require legal intervention are escalated to and officially recorded by the police.

4.8.7.3 GENDER BASED VIOLENCE

According to records from the Gambegre Block, no general Gender-Based Violence (GBV) cases have been reported in Corridor 8, indicating a relatively safe environment for women. Additionally, cases

Disclaimer: This is a Draft Version and is being reviewed by the World Bank under the Protection of Children from Sexual Offences (POCSO) Act have been registered over the years. Consultations in Corridor 8 revealed that no such cases were reported in the current year.

4.9 Socio-Economic Profile of Project Affected Households

Socio-economic data of project-affected households were collected through census and socio-economic surveys, systematically tabulated and analyzed to assess the extent of adverse impacts on land, structures, and livelihoods. A structured, pretested questionnaire was used as the primary tool for conducting these surveys. The survey has been conducted in September 2025.

4.9.1 DEMOGRAPHY

The total number of project-affected households is 5. The Table 4.14 below summarizes the gender distribution of the head of the Household. In Sub project road, 5 are male presented in Table in 4.11.

Table 4.11: Gender Distribution of PAHs

Gender	Corridor 8 (AP Road)	Percentage
Male	5	100
Female	0	0
Total	5	100

Source: EIS primary survey – 2025

4.9.1.1 GENDER DISTRIBUTION OF PROJECT-AFFECTED PERSONS

Out of a total of 20 Project Affected Persons (PAPs), 12 are male (60%) and 8 are female (40%), indicating an almost equal distribution between male and female beneficiaries. Details are given in **Table 4.12**.

Table 4.12: Gender Distribution of Project-Affected Persons (PAPs)

	Project Affected Persons	Percentage
Male	12	60
Female	8	40
Total	20	100

Source: EIS primary survey – 2025

4.9.1.2 ETHNICITY

The detailed distribution of ethnic groups in corridor wise is given in **Table 4.13** below. In Corridor 8, a total of 5 individuals belong to Garo Community.

Table 4.13: Community Wise Distribution of PAHs

Communities	Corridor 8	Percentage
Garo	5	100
Rabha	0	0
Muslim	0	0
Total	5	100

Source: EIS primary survey – 2025

4.9.2 IMPACT TO VULNERABLE HOUSEHOLDS

Census and Socio-economic survey will identify vulnerable group of households which included women-headed households, below-poverty-line, physically disabled, and elderly population (60+ years). **Table 4.14** below describes the distribution pattern of vulnerable group in the study area.

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Table 4.14: Distribution of Vulnerable Group

Vulnerable Category	PAHs	Percentage
Schedule Tribe	5*	100
Aged persons above 60 years	2	40
Below Poverty Line	0	0
Woman Headed Household	0	0
Other Backward Classes	0	0
Physically Challenged	0	0

Source: EIS primary survey – 2025

*All 5 households are vulnerable.in which 2 are Aged persons above 60 years.

4.9.3 ECONOMIC PROFILE

EMPLOYMENT PATTERNS

4.9.3.1 Private Business/ Entrepreneurship

Among the 5 Project Affected Households (PAHs), the majority (4) are engaged in private business, while 1 depend on agriculture. **Table 4.15** below describes **Occupation pattern of PAHs in sub-project area**

Table 4.15: Occupation pattern of PAHs in sub-project area

Sl. No.	Occupation	PAHs
1	Agriculture	1
2	Private Business	4
3	Service (Govt / Pvt.)	0
4	Others (Non-Working)	0
Total		5

Source: EIS primary survey – 2025

4.9.3.2 INCOME

In Sub Project Road, none of the households fall in the annual income range below ₹50,000. all 5 households have an income between ₹50,000 and ₹1,00,000, indicating relatively higher income levels among the affected families. **Table 4.16** below describes **Annual Income Range of PAHs**

Table 4.16: Annual Income Range of PAHs

Sl. No.	Annual Income Range of HH	Corridor 8	
		No. of PAHs	Percentage
1	less than 25000	0	0
2	25000- 50000	0	0
3	50000-100000	5	100
4	More than 100000	0	0
Total		5	100

Source: EIS primary survey – 2025

4.9.4 EDUCATION

In Corridor 8, out of a total population of 137 persons, education levels show a balanced distribution

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across genders. The majority have studied up to high school (37 persons), followed by 30 with primary education and 16 with higher secondary education. A smaller group of 12 individuals are graduates or above, while 16 are illiterate. Overall, male (74) and female 63 participation across education levels is nearly equal. Details of Education Level of PAPs is given in **Table 4.17**.

Table 4.17: Education Level of PAPs

Sl. No	Education	Corridor 8		
		Male	Female	Total
1	Children below 6 years	3	4	7
2	Primary (Class 1 to 4)	2	0	2
3	High School (Class 5-10)	1	3	4
4	Higher Secondary (Class 11-12)	1	0	1
5	Graduate and above	0	1	1
6	Illiterate	2	3	5
	Total	10	11	20

Source: EIS primary survey – 2025

4.9.5 HEALTH STATUS

The predominant waterborne diseases in the study area include diarrhea, typhoid, Malaria and cholera, which pose significant health risks, particularly in regions with limited access to clean water and healthcare services as per public consultation with KII (Table 7.1). Poor sanitation and contaminated water sources further contribute to illnesses such as hepatitis A and typhoid fever. In addition, communicable diseases like dengue fever and respiratory infections continue to be prevalent concerns in the area (Table 7.1).

As per community consultation, AP settlements have made significant progress in sanitation. However, some households still lack access to well-constructed toilets with proper sewage disposal systems. The absence of public toilets and washrooms remains a critical issue, especially for individuals working in open or shared spaces.

Darengre PHC in Gambegre Block PHC serves as the primary healthcare facility, within the Project Influence Area (PIA),

4.9.6 IMPACT TO STRUCTURES

The project corridor wise details of the impacted structures³. are given in below **Table 4.18**. Chainage wise details are provided in **Annexure 4.3**.

Table 4.18: Type of Impact on Project Affected Household

Type of Impacts	Corridor 8	%
Residential (Major)	0	0
Commercial (Major)	0	0

³ "Majorly affected" refers to persons who experience involuntary resettlement due to significant impacts such as loss of residence, commercial shops, livelihoods, or permanent access to land or other assets essential for their life and income.

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Res. Cum Comm. (Major)	0	0
Other Minor Structures (Tin Shade and Bamboo fencing of House)	02	40
Temporary Encroachment (Kiosk)	3	60
Total	5	100

4.9.7 LOSS OF TREES

Approximately 15 trees are situated within the existing Right of Way (RoW) on both sides of the road. To mitigate the ecological impact of tree felling, compensatory afforestation should be carried out, in accordance with applicable environmental regulations and guidelines. These measures, along with their implementation strategies, are comprehensively detailed in the Environmental and Social Management Plan (ESMP).

4.9.8 COMMON PROPERTY RESOURCES

The Common Property Resources (CPR) assessment classifies structures into two categories: government facilities and community/public facilities. Government structures, comprising 05 minor structures such as compound walls (CWs) of government buildings, schools, and community halls, are situated away from the proposed ROW. Since they are outside the direct influence zone, no adverse impacts are anticipated. A summary of CPRs is provided in **Table 4.19**.



Table 4.19: Common Property Resources

Sl. No.	Type of CPR Structures	Chainage	Distance from the PROW
1.	School	Ch. 20+200	7 m from center line LHS
2.	Church	Ch 20+250	6 m from center line RHS
3.	Baptist Church	Ch 24+000	7 m from center line RHS
4.	Mebitpara School	Ch 24+100	6m from center line LHS
5.	Sub Station	Ch 26+800	8 m from center line LHS
6.	Community Hall	Ch 27+600	5 m from Centre line RHS

An illustrative view of the CPRs / Other important locations, along with their respective distances from the centerline, is presented in Figure 4.7 below.

Ch. No	LHS / RHS	Structure	Geo tagged photos
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20+200	LHS	School	 <p>Latitude: 25°22'5" Longitude: 90°0'32" Elevation: 127.59±266.0 m Accuracy: 14.3 m Time: 15-06-2025 10:38 Note: 4+000 the school AP road</p>
20+250	LHS	Church	 <p>Latitude: 25°22'5" Longitude: 90°0'32" Elevation: 127.59±266.0 m Accuracy: 14.3 m Time: 15-06-2025 10:38 Note: 4+000 the school AP road</p>
24+000	RHS	Baptist Church	 <p>Latitude: 25°20'23" Longitude: 90°0'32" Elevation: 85.0±66.7 m Accuracy: 9.1 m Time: 15-06-2025 11:06 Note: 4+000 the baptist church AP road</p>
24+100	LHS	Mebitpara School	 <p>Latitude: 25°20'21" Longitude: 90°0'34" Elevation: 84.9±49.5 m Accuracy: 8.5 m Time: 15-06-2025 11:07 Note: 4+050 the mebitpara school AP road</p>
27+100	RHS	Grazing Field Baptist Church	 <p>Latitude: 25°18'46" Longitude: 90°0'23" Elevation: 110.4±50.0 m Accuracy: 8.3 m Time: 15-06-2025 11:22 Note: 7+100 Grazing field Baptist church AP road</p>

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26+800	LHS	Sub Station	
27+600	RHS	Community Hall	
27+800	RHS	Community Hall	
	Present Road Condition		

Figure 4.6: Illustrative view of the road features in Corridor 8

4.10 Hazard And Vulnerability Profile

The Hazard and Vulnerability profile of the AP Road area and South West Garo Hills district includes landslide hazards, flash flood, earthquake, etc. The drought, group clash, fire incidents, etc. also occur in

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the district. The seasonal hazard analysis of South West Garo Hills District⁴ is given in **Table 4-20** below.

Table 4.20: Hazard analysis

Type of Hazards	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Landslide			←	-----	-----	-----	-----	-----	-----	→		
Earthquake	←	-----	-----	-----	-----	-----	-----	-----	-----	-----	→	
Flashflood		←	-----	-----	-----	-----	-----	-----	-----	→		
Storm			←	-----	-----	→						
Fire Accident	←	-----	-----	-----	-----	-----	-----	-----	-----	-----	→	
River Erosion				←	-----	-----	-----	-----	→			
Industrial Hazard	←	-----	-----	-----	-----	-----	-----	-----	-----	-----	→	
Road Accident	←	-----	-----	-----	-----	-----	-----	-----	-----	-----	→	

4.10.1 EARTHQUAKE ZONES

The project road stretches fall under Zone – V, which is at Very High risk and intensity is IX. Seismic Zone details of South West Garo Hills is presented in **Table 4.21**.

Table 4.21: Seismic Zone details of South West Garo Hills

District	Seismic Zone	Notable Faults / Lineaments	Recent Earthquakes
South West Garo Hills	Zone V (highest risk).	Local faults/lineaments identified in district studies — notably Yamuna and Dapsi faults (mapped in CGWB district geological report). These are part of the regional structural fabric related to the Dauki–Kopili–Shillong Plateau fault systems. Source: (CGWB: 2018-1019)	Small-magnitude tremors are occasionally recorded in/near the district (typically $M \approx 2-4$). National Centre for Seismology / regional catalogs list scattered low-magnitude events in the Garo Hills region; commercial earthquake trackers also show occasional recent quakes near South West Garo Hills. No major ($M \geq 6$) local events reported in the recent instrumental record for the district. Source: (riseq.seismo.gov.in)

4.10.2 VULNERABILITY STATUS OF PROJECT

An assessment was done based on the number of occurrences through satellite image processing Science Research, Landslides, (2022), Meghalaya SAPCC. Based on this assessment list of various hazards and vulnerability status along the AP Road are given below.

⁴ District Disaster Management Plan for Meghalaya, 2024

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1. High Vulnerability:

Roads in hilly areas, particularly other district road and its connecting roads, are highly vulnerable to landslides and debris slides during extreme rainfall events.

In the reviewed stretch of the project road, no direct instances of flooding or water logging were observed. However, certain locations were identified as potentially vulnerable to such conditions due to their proximity to riverbanks and hydraulic structures. At chainage 20+500, soil erosion was noted near the riverbank, indicating possible impact from floodwater or high river flow, necessitating protection work. Similarly, between chainage 21+200 and 21+300 on the left-hand side, erosion along the riverbank suggests potential risk of inundation or waterlogging during heavy rains, for which suitable bank protection measures are recommended. At chainage 23+850, erosion was observed at the abutment location of a minor bridge, which could be attributed to scouring caused by flood flow, requiring protective works at the abutment section. Further, at chainage 25+000, soil erosion was observed along the left riverbank, indicating the need for river training measures to mitigate potential flood-induced damage. Overall, while no direct flooding or waterlogging was recorded, these erosion-prone sections are considered susceptible to flood-related impacts and should be adequately protected through appropriate engineering interventions.

2. Moderate Vulnerability:

Temperature fluctuations and high wind velocity contribute to gradual deterioration of road surfaces, especially asphalt roads. Over time, these conditions increase maintenance costs. Riverbank erosion is a significant concern along the stretch.

Soil erosion was observed at several locations along the project road alignment. At chainage 20+500, significant soil erosion was noted near the riverbank, indicating active scouring likely due to flowing water; protection work is required at this location to stabilize the bank. Between 21+200 and 21+300, soil erosion was observed on the left-hand side (LHS) of the riverbank, suggesting continued bank instability and the need for appropriate erosion control and protection measures. At 23+850, erosion was identified at the abutment location of a minor bridge, which may compromise the structural stability of the bridge if not addressed; hence, protection work is recommended at this section. Further, at 25+000, soil erosion was recorded along the left riverbank, indicating the need for river training works to prevent further loss of embankment material. Overall, these chainages reflect localized but significant soil erosion issues primarily associated with riverbank areas and bridge structures, requiring immediate protective and stabilization measures.

To address this, riverbank protection works are proposed, including stone pitching, retaining walls, and vegetative stabilization measures such as planting deep-rooted native grasses and shrubs along the embankment. These interventions aim to arrest further soil loss, stabilize the slope, and minimize sedimentation in the river channel. Regular monitoring and maintenance of these protection measures will ensure the long-term stability of the road and adjacent riverbanks. This indicates that the section is vulnerable to surface runoff and sediment displacement, which could affect the stability of the bridge foundations and the adjoining road embankment.

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5. ENVIRONMENTAL AND SOCIAL RISKS AND IMPACTS

5.1 Introduction

The project is expected to generate both positive and adverse environmental and social impacts along the 8 km priority roads in Corridor 8 (AP Road). This chapter analyzes the potential impacts arising from the implementation of project activities. The impacts differ in type, nature, magnitude, extent, timing, duration, certainty, and reversibility.

The assessment takes into account the nature of the project, the scope of activities, and the potential magnitude of impacts across different environmental and social components, namely:

- **Physical Environment:** air quality, water resources, noise levels, and soil
- **Biological Environment:** flora and fauna
- **Socio-economic Components:** property removal, additional land requirement, and influx of labor

5.2 Impacts Identification and Evaluation

The potential impacts were identified in three main steps:

1. Identification of project activities/aspects causing impacts;
2. Establishing affected environmental and social components (valued receptors). These were determined to include vegetation, water bodies, soil, land stability, water quality and quantity, ambient air quality, employment and livelihoods, vulnerable groups, infrastructure, public safety and occupational health and safety;
3. Determining potential environmental and social impacts in an impact Identification Matrix

Based on the understanding of the project information as outlined in chapter 3 and baseline environmental conditions detailed in chapter 4, the anticipated impacts of the MLCIP project are identified and discussed in the subsequent sections. The potential environmental and social impacts (both adverse and positive) of the MLCIP project activities during the Design, Construction and Operational Phases were identified and evaluated through the Leopold Matrix, where the interactions between relevant project activities and the natural/physical environmental components and the social components were considered to determine whether or not the interaction may create potential impacts.

5.3 Impact Analysis Using Leopold Matrix (Magnitude/Importance Classification)

The Leopold Matrix is a comprehensive checklist designed for the identification, evaluation, assessment and analysis of environmental impacts on the development project following the interaction matrix analysis approach by Leopold. The Leopold Matrix developed for the road up gradation project is provided as **Table 5.1**. The checklist interaction matrix for environmental impact assessment was obtained by placing identified existing environmental components in the columns and the proposed project activities in the rows of the matrix. The process is summarized as follow:

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5.3.1 Impact Evaluation Matrix

In order to assess the impacts of the proposed project, the impacts analysis across the project phases was done as follows.

1. Pre-Construction Phase
2. Construction Phase
3. Operational Phase

The description of the project activities and magnitude of the impacts for the various environments and social components for this project are presented in the below table. These impacts further have been categorized as per the World Bank's Environmental and Social Standards (ESSs) applicable to the project.

Table 5.1: Impact Evaluation Matrix

Project Activity	Relevant WB ESS	Air Quality	Noise	Water Resources	Soil Stability	Flora & Fauna	Public Health	Community Safety	Cultural Heritage	Hazardous Material Risk	Drainage	Road Safety
Pre-Construction Phase												
Site Clearance (Tree Felling, Vegetation removal, utility relocation)	ESS1, ESS6, ESS8	MN	MN	N	MN	MN	LN	LN	LN	N	N	LN
Labour Camp Siting & Mobilization	ESS1, ESS2, ESS4	MN	MN	MN	N	Low	MN	MN	N	MN	LN	N
Site identification for construction plants, quarrying, material storage	ESS2, ESS3, ESS4, ESS6	HN	HN	HN	MN	HN	HN	HN	MN	HN	HN	HN
Construction Phase												
Earthworks (Excavation, Filling)	ESS1, ESS3, ESS4	MN	HN	MN	HN	MN	MN	LN	LN	MN	MN	MN
Grading, Levelling and Surface laying	ESS2, ESS3, ESS4	HN	HN	MN	MP (Improved Stability)	MN	MN	LN	LN	MN	MN	MN
Drainage & Culvert Installation	ESS3, ESS4	N	LN	MP (Improved Drainage)	MP (Improved Stability)	LP	LP	LP	N	N	MP	LP
Slope Stabilization & Bioengineering	ESS3, ESS4, ESS6	N	N	LN	MP (Improved Slope Stability)	MP	LP	LP	N	N	MP	LP

Construction Water Usage	ESS3, ESS4	LN	N	MN	LN	LN	LN	LN	N	N	LN	LN
Operation of Construction Plants	ESS2, ESS3	HN	HN	HN	N	MN	MN	MN	N	HN	MN	MN
Waste Generation and Disposal	ESS3, ESS4	MN	N	MN	MN	MN	HN	MN	N	HN	HN	MN
Fuel and Hazardous Material Handling	ESS2, ESS3, ESS4	MN	N	MN	N	LN	HN	MN	N	HN	N	N
Construction Traffic & Machinery	ESS2, ESS4	HN	HN	LN	LN	LN	MN	MN	N	MN	N	HN
Health & Safety Training and OHS Implementation	ESS2, ESS4	HP	HP	HP	N	N	HP	MP	N	MP	N	MP
Decommissioning of Construction Sites, Plants, Labour Camps	ESS2, ESS3	MN	MN	MN	MN	LN	MN	LN	N	MN	LN	LN
Operational Phase												
Operational Traffic Flow	ESS4, ESS10	LN	LN	LN	LN	LN	MP (Improved Access to Health Services)	MP(Improved Connectivity)	LN	LN	MP (Improved Drainage)	MP (Improved Road Safety)

								y)				
Transportation of Hazardous Materials	ESS4	MN	LN	LN	LN	MN	HN	HN	MN	HN	MN	HN
Compensatory Plantation	ESS6	HP	N	MP	MP	HP	MP	MP	LP	N	MP	HP
Monitoring & Community Engagement	ESS10	-	—	—	—	—	MP	MP	N	N	N	LP

Project Activity	Relevant WB ESS	Air Quality	Noise	Water Resources	Soil Stability	Flora & Fauna	Public Health	Community Safety	Cultural Heritage	Hazardous Material Risk	Drainage	Road Safety
Pre-Construction Phase												
Project Activity	Relevant WB ESS	Air Quality	Noise	Water Resources	Soil Stability	Flora & Fauna	Public Health	Community Safety	Cultural Heritage	Hazardous Material Risk	Drainage	Road Safety
Pre-Construction Phase												
Project Activity	Relevant WB ESS	Air Quality	Noise	Water Resources	Soil Stability	Flora & Fauna	Public Health	Community Safety	Cultural Heritage	Hazardous Material Risk	Drainage	Road Safety
Pre-Construction Phase												

HN – High Negative Impact, MN – Moderate Negative Impact, LN – Low Negative Impact, N – Neutral Impact, LP – Low Positive Impact, MP – Moderate Positive Impact, HP – High Positive Impact

Interpretation of Impact Assessment Matrix

The **Table 5.1** presents the environmental and social significance ratings of various project activities during the pre-construction, construction, and operational phases of the AP Road sub-project.

Pre-Construction Phase

Activities such as site clearance, tree felling, and utility relocation (ESS1, ESS6, ESS8) are assessed as having moderate to minor (MN–LN) environmental and social impacts due to localized vegetation removal and possible disturbance to cultural or community assets. Labour camp siting and mobilization (ESS1, ESS2, ESS4) exhibit moderate risks, primarily associated with worker welfare, land use conflicts, and sanitation. Identification of sites for construction plants, quarrying, and material storage (ESS2, ESS3, ESS4, ESS6) represents a high-risk (HN) activity, as it can significantly affect land stability, noise, dust, and habitat quality if not properly managed.

Construction Phase

The earthworks, grading, and surface laying (ESS1–ESS4) have moderate to high impacts (MN–HN) due to soil disturbance, erosion, dust generation, and safety concerns, although they also produce positive impacts (MP) through improved slope stability and road quality. Drainage and culvert installation and slope stabilization with bioengineering (ESS3, ESS4, ESS6) are considered moderately positive (MP) activities, improving overall stability and flood resilience of the corridor. Construction water usage, waste generation, and fuel handling have low to moderate impacts, mainly localized and temporary in nature. Health and safety measures and OHS implementation (ESS2, ESS4) result in high positive impacts (HP) by improving worker welfare and reducing accident risks. Decommissioning of construction sites and labour camps carries minor to moderate residual impacts, which can be mitigated through site restoration and waste clearance.

Operational Phase

During operation, the road will yield several positive outcomes, including improved connectivity, access to health and education services, better drainage, and enhanced road safety (ESS4, ESS10). Compensatory plantation under ESS6 contributes high positive (HP) environmental benefits, supporting biodiversity restoration and slope stabilization. Finally, monitoring and community engagement (ESS10) ensure long-term sustainability and social inclusion, producing moderate to low positive impacts through participatory oversight and grievance redress.

5.4 Environmental Impacts (ESS1, ESS2, ESS3, ESS4, ESS6, ESS8)

The assessment of potential environmental impact consists of comparing the expected changes in the environment with or without the project. The analysis predicts the nature and significance of the expected impacts. The following sections provide a detailed analysis of the project's environmental and social impacts across its various phases in detail. Corresponding mitigation measures have been incorporated into the sub-project ESMP and sub-project RAP, IPDP, including project-level plans (LMP, Work Site safety Plan (OHS plan), SEP, and SEA/SH Prevention and Response Plan). Based on this indicative ESMP, contractor will prepare contractor's environment and social management plan (C-ESMP) and get it approved by MPWD before starting the pre-construction work.

5.4.1 IMPACTS DURING PRE-CONSTRUCTION PHASE

The project envisages upgrading the existing single-lane carriageway to an intermediate lane configuration to enhance the capacity and extend the service life of the Ampati to Purakhasia(AP) Road. While most construction activities are proposed within the existing Right of Way (RoW), minor land acquisition will be required at specific locations for curve correction, embankment raising, drainage improvement, and slope protection.

Pre-construction activities will primarily include:

- Site clearance and reconstruction/improvement of approach roads for movement of plant and machinery,
- Establishment of contractor's camp, material storage, and construction yard, and
- Planning for material sourcing and finalization of work methodology.

The work methodology will define activity sequencing and associated occupational and community health and safety (OHS/CHS) risks. It will be reviewed by the Project Management Unit (PMU) and CSMP prior to mobilization.

During the pre-construction phase, potential impacts are anticipated from site clearance, vegetation removal, tree felling, material sourcing, labour camp establishment, and utility relocation. A total of 15 trees will be felled along the corridor, leading to localized loss of vegetation and minor habitat disturbance (ESS6). These impacts will be mitigated through compensatory plantation at a minimum ratio of 1:10, greenbelt development, and adoption of native species tolerant to local climatic and pollution conditions.

Significant utility shifting is required prior to the commencement of construction works. A total of 44 electric poles, 1 transformers, and 32 electric line crossings have been identified along the AP corridor for relocation—of which 15 poles are located on the Left-Hand Side (LHS) and 29 poles on the Right-Hand Side (RHS). Additionally, 9 Optical Fiber Cable (OFC) pillars will require shifting, comprising 3 on the LHS and 6 on the RHS. Utility relocation activities may temporarily disrupt local services and traffic movement, and therefore must be planned and executed in coordination with respective line departments, ensuring safety and minimal community inconvenience (ESS4).

The sourcing of materials such as aggregates, sand, and stone may cause short-term adverse impacts on land, air, and water quality if not properly managed. Hence, materials shall be procured only from authorized borrow areas, licensed quarries, and SPCB-approved crushers following CPCB guidelines (ESS3). The establishment of labour camps and construction support facilities may exert localized

pressure on water availability, sanitation systems, and waste management infrastructure. Appropriate provisions for safe drinking water, adequate sanitation, drainage arrangements, and solid waste disposal must be made to prevent health and hygiene issues in compliance with ESS2 and ESS4.

Early-stage stakeholder engagement (ESS10) and preparation of a Contractor's Environmental and Social Management Plan (C-ESMP) will be essential. The C-ESMP shall apply the mitigation hierarchy—prioritizing avoidance, and then minimization, and finally offsetting and restoration through design improvements, slope stabilization, compensatory plantation, and safety training. Implementation of these measures during the pre-construction stage will ensure environmentally responsible preparation and minimize potential social disruptions before commencement of construction works.

Ecological and Environmental Impacts

Although the AP corridor passes mostly through agricultural and open forest areas, there are patches of community forest, streams, and ecologically sensitive slopes that may be disturbed by construction activities. Site-specific **Environmental Management Plans (EMP)** will be developed by the contractor in consultation with the Environment Officer of PMU to minimize biodiversity loss.

Mitigation Measures:

- Avoid construction camps and material storage near streams or forest patches.
- Restrict vegetation clearing to the minimum area required for works.
- Maintain a buffer of at least 100 m from natural drainage channels or water bodies.
- Implement soil erosion control measures (silt fencing, sediment traps, and slope turfing).
- Prohibit hunting, fishing, or collection of forest produce by workers.
- Awareness and sensitization of labourers on local wildlife and biodiversity conservation.
- Schedule noisy operations (rock breaking, heavy equipment use) away from bird nesting seasons (March–July).

Occupational Health and Safety (OHS)

To ensure safe working conditions, a **Hazard Identification and Risk Assessment (HIRA)** will be conducted for each task.

Mitigation Measures:

- Develop and implement a site-specific OHS Plan conforming to World Bank Environmental, Health and Safety (EHS) Guidelines.
- Provide PPE (helmets, safety shoes, high-visibility vests, gloves) to all workers.
- Conduct regular health check-ups for labourers.
- Ensure proper sanitation, potable water (minimum 5 litres per person per day), and waste disposal facilities in camps.
- Regular inspection and certification of lifting and construction equipment.
- Engage trained personnel for operating machinery and working at height or confined spaces.

Community Health and Safety

Construction works along existing habitations and roadside markets can pose safety risks to pedestrians and road users.

Mitigation Measures:

- Prepare and implement a **Traffic Management Plan** to regulate vehicle movement, material haulage, and diversions.
- Install barricades, signage, and warning lamps at work sites.
- Prepare a **Community Health and Safety Plan** ensuring public segregation from work zones.
- Schedule high-risk activities during off-peak hours to minimize traffic congestion.
- Conduct community awareness campaigns before any temporary road closure or service disruption.

The OHS Plan, CHS Plan, and Traffic Safety Plan must be reviewed and approved by PMU/PMTC before initiation of construction.

Construction Camp and Site Selection

Contractor's camps, stockpile, and equipment yards will be located at least 500 m from settlements and 100 m from water bodies or forest areas. Camps should follow **IFC/World Bank Labour Accommodation Guidelines** and local environmental norms. The layout of camps will be reviewed and cleared by the Environment Officer, PMTC prior to establishment.

Disposal of Construction Debris and Waste

Limited C&D waste (excavated material, asphalt fragments, scrap metal) will be generated.

Mitigation Measures:

- Segregate reusable and non-reusable debris.
- Reuse topsoil for slope stabilization and landscaping.
- Dispose of debris only at approved low-lying barren areas located at least 1 km downwind of settlements and away from drainage lines.
- Avoid dumping in water bodies, wetlands, or near agricultural fields.
- Regularly monitor disposal sites to prevent contamination and visual pollution.

Shifting of Utilities

Minor relocation of electrical poles, telephone lines, and water pipelines may be required.

Mitigation Measures:

- Coordinate with line departments (MePDCL, PHE, Telecom) for planned relocation prior to construction.
- Provide prior notice to local communities about any temporary service disruption.
- Restrict utility shifting to daytime hours to avoid safety risks at night.

Plant, Machinery, and Vehicle Selection

All construction equipment and vehicles shall comply with **CPCB emission standards** and have valid **Pollution Under Control (PUC)** certificates. The contractor shall maintain equipment in good working condition to minimize noise and air pollution.

Sourcing of Construction Materials

All aggregates, sand, and stone shall be sourced only from **approved quarries** having valid environmental clearance and consent to operate. Borrow areas, if required, shall comply with **MoEF&CC Standard Operating Procedures (SOP 2022)** for rehabilitation and closure.

Mitigation Measures:

- Contractor to submit quarry permits, EC copies, and compliance reports before material use.
- No borrowing shall be allowed within forest areas or near habitations.
- Borrow area restoration to be certified by the Environmental Officer, PMU before final payment.

Water Requirement

Construction water will be required for concrete mixing, dust suppression, and domestic use.

Mitigation Measures:

- Obtain permission for groundwater abstraction from the State Water Resources Department.
- Prefer use of surface water from local streams or treated water from nearby sources.
- Avoid over-extraction from community wells.
- Maintain drainage around storage and batching areas to prevent stagnation.

5.4.1.1 IMPACTS ON PHYSIOGRAPHY (ESS3)

The AP project area comprises an existing road that traverses through hill, rolling, and plain terrain. The land use along the road stretches is primarily agricultural, interspersed with dense vegetation and areas of shifting cultivation. The proposed improvement will follow the same alignment, upgrading the existing single/intermediate lane to an intermediate lane with paved shoulders, along with geometric corrections at selected locations.

The existing ground profile will be maintained, with minor profile adjustments at certain locations. Rehabilitation, and upgradation, will generally be restricted to the existing right-of-way (ROW) in settlement areas.

The Ampati to Purakhasia (AP) Road traverses gently undulating terrain with elevations ranging from 50 m to 212 m amsl, where only minor cutting and filling are required to achieve the desired formation level. The total estimated cut quantity is 1234426.3 m³ and fill quantity is 29111.61 m³, resulting in a surplus of approximately 1205314.69 m³ of excavated material to be disposed of at MPWD-designated sites. Borrow areas and quarry sites for the AP road project have been identified to ensure a reliable and sustainable supply of construction materials such as sand and stone. The project will require 4,005.2 m³ of fine sand, 2,670.2 m³ of coarse sand from Tura Quarry, and 33,200.6 m³ of aggregate from Pipulbari Quarry, along with major construction materials including 571 MT of bitumen, 48 MT emulsion, 14 MT TMT steel, and 405 MT cement sourced from regional suppliers. These materials will support pavement layers, structures, and road strengthening over the 8 km corridor. Local and regional sourcing helps ensure availability and reduces transportation constraints.

5.4.2 IMPACTS DURING CONSTRUCTION PHASE

Most of the adverse environmental impacts are related to construction works which are inevitable but are manageable through certain tested and known environment friendly practices. The negative environmental effects can be taken care of at an early stage through proper engineering designs and through the contract during construction practices.

Construction Phase

The construction phase involves earthworks, grading, drainage works, slope protection, and culvert installation, which are expected to cause significant short-term adverse impacts on air quality, noise, water resources, and soil stability (ESS2, ESS3, ESS4). Occupational health and safety (OHS) risks including accidents, exposure to dust and noise, handling of heavy machinery, and potential landslides require robust safety protocols.

Mitigation measures under the C-ESMP include:

- Erosion control and slope stabilization proposed at multiple chainages including 20+500, 21+200–21+300, 23+850, and 25+000, using river training structures, slope protection, and abutment reinforcement to prevent bank failure and protect bridges.
- Road safety and traffic management measures introduced at 23+800 and 27+460, including speed reduction near schools and curve improvement to safeguard road users and adjacent structures.
- Structural repairs and maintenance recommended at 23+200 and 25+480, such as culvert apron repair and filling major potholes to ensure smooth and safe road operation.

Additionally, the Contractor must ensure provision of PPE, emergency preparedness plans, spill prevention measures, and OHS training and monitoring to reduce worker and community risks.

Labour Camp and Community Health & Safety

Labour camps and site operations pose community health and safety risks (ESS2, ESS4), including sanitation, water access, and increased traffic hazards. Labour influx may exacerbate these risks if not well managed. Hence, the C-ESMP must ensure adequate water supply, waste management, health facilities, and grievance mechanisms, as well as community liaison programs to maintain good relations between workers and local residents.

The standard road construction works involved are site clearance, excavation, filling of earth materials and subgrade materials, laying of bituminous mixtures, handling of hazardous materials like bitumen, diesel, etc., dumping of unusable debris materials, transportation of materials from production site to construction site, and other constructional activities and associated works like mobilization of construction equipment, setting up of construction plants, setting up of workforce camps, quarrying, material storage etc. These activities have certain impacts of various magnitudes on different components of the environment.

The anticipated impacts due to all these activities have been described below:

5.4.2.1 IMPACTS ON GEOLOGY (ESS3)

The construction of AP Road will require different materials such as earth, aggregate, boulders, and sand that occur naturally and whose formation process is slow and takes years. Minimizing the construction footprint on natural resources is a fundamental design principle for pavement and structures.

With an estimated surplus of approximately 1205314.69 m³ of excavated material after balancing cut and fill, the DPR emphasizes reuse of suitable cut and excavated earth for embankment formation, slope dressing, and construction of protection works such as toe walls, gabion retaining walls, and river training structures at critical erosion-prone locations, particularly near chainage 20+500, 23+850 and 25+00. In addition, stone and granular materials recovered from dismantling of existing pavement and drainage structures will be recycled and reused for sub-base layers, shoulder construction, and filter media where technically feasible, thereby reducing dependence on new quarry material. These practices not only conserve natural resources but also minimize environmental impacts from material extraction, transportation, and waste disposal. Only unsuitable or non-recyclable materials will be disposed of at MPWD-designated disposal sites in accordance with environmental management guidelines.

5.4.2.2 COMPACTION AND CONTAMINATION OF SOIL (ESS3)

Contamination of soil during the construction stage may happen primarily due to construction and allied activities. The sites where construction vehicles are parked and serviced are likely to be contaminated because of leakage or spillage of fuel and lubricants. Contamination of soil during construction might be a major long-term residual negative impact. Unwarranted disposal of construction spoil and debris will add to soil contamination. This contamination is likely to be carried over to water bodies in case of dumping near water bodies.

5.4.2.3 INCREASED EROSION AND LOSS OF TOP SOIL (ESS3)

Topsoil loss may occur in land parcels used for short-term purposes (e.g., borrow areas, construction camps) as well as in areas permanently impacted due to road rehabilitation, unless measures for preservation are adopted. Project activities such as tree cutting and vegetation clearance within the existing Right of Way (ERoW), followed by construction, improvement, and strengthening of the carriageway, may contribute to this loss.

Since the project involves upgrading an existing road alignment rather than developing a Greenfield corridor, substantial removal of topsoil is not anticipated. However, localized topsoil disturbance may occur during shoulder widening, drainage improvement, and embankment raising activities. To mitigate this, the ESIA prescribes specific topsoil management measures to be implemented during construction. These include: (i) stripping and preserving topsoil up to a depth of 150 mm from all areas of cutting, filling, and temporary construction zones; (ii) storing topsoil separately in designated stockpiles with proper slope protection and sediment barriers to prevent erosion; (iii) reuse of stored topsoil for median greening, roadside plantation, and slope turbing after construction; and (iv) prohibition of topsoil disposal at dumping sites. These measures shall form part of the Environmental Management Plan (EMP) and be monitored through the supervision consultant to ensure effective implementation during the construction phase.

The alignment traverses areas with sandy loam soils containing small amounts of clay and exhibiting low to medium plasticity. These light-textured soils are prone to erosion by wind and rainfall, and in hilly stretches, slope instability and minor landslides may occur. Additionally, the movement and operation of vehicles, construction equipment, and material transport during project execution may cause soil

compaction, particularly in borrow areas, temporary storage sites, and parking zones if not properly managed. Soil compaction reduces permeability and soil fertility, affecting natural drainage and vegetation growth. To minimize this impact, all construction activities and machinery movement will be strictly confined within the designated Right of Way (RoW) and approved working areas. Parking and servicing of vehicles and equipment will be allowed only in designated hard-surfaced zones, while borrow areas will be managed to prevent soil degradation through controlled excavation, use of light equipment, and post-extraction rehabilitation as per the approved Borrow Area Management Plan. These measures will ensure that soil structure and fertility in adjacent agricultural and community lands remain unaffected.

5.4.2.4 BORROW AREAS AND QUARRIES (ESS3)

Construction materials required for the project road will be transported from Borrow area and Quarries. Details of Quarries site is given in Table 3.5 of Chapter 3.

Opening of a new borrow pit creates the following impact:

- The borrowing of earth in an unregulated manner may lead to unstable slopes, erosion, loss of fertility, inundation of water, breeding areas for mosquitos and an unhygienic environment. Fertile topsoil may be wasted if not preserved for backfilling.
- The transportation of earth from borrows and quarry areas in open/uncovered trucks can increase the dust levels and overloaded borrow transportation material may cause spillage of material on road causing dust, high emission, vehicle wear and tear, road surface damage due to overloading.
- Haul roads may develop surface damage due to plying of trucks and if left unattended may cause problems to other pedestrians and commuters on the road.
- Open borrow pits abandoned without proper restoration may lead to accidents and risks of social nuisance.

. The earthwork details in the project area are listed in **Table 5.3** below.

Table 5.2: Earthwork details in the project area

Corridor	Fill (m ³)	Cut (m ³)
Corridor-8	29111.61	1234426.3

From the above table it is calculated that after balancing cut and fill, the remaining quantity of 1205314.69 cu.m earthwork will be dumped/disposed by the contractor only at a place designated and authorized by the MPWD. The details of muck disposal sites are provided in **Table 5.3**. Average height should be 1.5 m to 2 m.

Table 5.3: Details for the muck disposal sites

Dumping Location			Coordinate		Area m ²
SL. NO	LOCATION CHAINAGE	SIDE	X	Y	
1	19+850	LHS	199059.03	2808346.15	3500

Mitigation Measures

- For sitting location of a muck disposal site include selecting a location with stable topography, away from water bodies and agricultural land, to prevent environmental contamination.
- Muck disposal sites shall be located on stable, non-erodible terrain away from water bodies and agricultural land.
- Dumping will be done in compacted layers (≤ 1 m thick) with retaining walls, drainage channels, and slopes maintained within the natural angle of repose (30° – 35°).
- Each site will be protected with toe walls, sediment traps, and vegetative cover for stabilization.
- The contractor shall operate only at approved locations under supervision and maintain the site until full rehabilitation is achieved.
- The site should incorporate proper retaining structures, such as toe walls and catch drains, to prevent sliding and erosion.
- Adequate drainage must be provided through surface and subsurface channels to control runoff.
- Muck should be deposited in layers, compacted, and stabilized using vegetation or geo-textiles to minimize dust and erosion.
- Access roads should be provided to ensure safe transport of muck, and the site should be fenced and clearly demarcated.
- Environmental safeguards, including periodic monitoring and rehabilitation plans, must be integrated into the design to ensure long-term stability and ecological compliance.

The typical design of the each muck disposal site is incorporated into the DPR. Dumpsite Stabilization Plan is attached as **Annexure 5.1**.

5.4.2.5 AMBIENT AIR QUALITY (ESS3)

Construction stage impacts will have adverse impacts on the workers as well as the settlements adjacent to the road, especially those in the downwind direction. There are two types of pollution, i.e. dust pollution and pollution from harmful gases.

Impacts from Generation of dust

- Transportation and tipping of cut material - while the former will occur over the entire stretch between the cutting location and disposal site, the latter is more location specific and more intense;
- Transportation of raw materials from quarries and borrow sites
- Stone crushing, handling, and storage of aggregates at on-site asphalt mixing plants are integral to the AP Road Corridor project. These activities generate significant dust and noise.
- Site levelling and vegetation clearing, including the removal of trees and topsoil, are being carried out along the alignment to prepare for subgrade laying. These operations are critical but

environmentally impactful, especially near forested or community areas.

- Concrete batching plants and asphalt mix plants are being set up along the corridor to support continuous construction. These facilities involve the mixing of aggregates with bitumen, releasing particulate matter, hydrocarbons, and heat, which may affect local air quality and nearby settlements
- Construction of structures and allied activities

Impacts from Generation of polluting gases including SO₂, NO_x and CO

- Large construction equipment, trucks and asphalt producing and paving equipment
- The movement of heavy machinery, oil tankers etc.
- Inadequate vehicle maintenance and the use of adulterated fuel in vehicles.

The impacts are expected to be temporary (limited to construction period) and confined within construction areas.

Mitigation Measures for Ambient Air Quality (ESS3)

Impact Source	Mitigation Measures
Transportation and tipping of cut material; site levelling and excavation	Regular water sprinkling (at least 3 times in a dry season) on haul roads, excavation areas, and disposal sites to suppress dust. Limit vehicle speeds to 25 km/h on unpaved roads.
Transportation of raw materials from quarries and borrow sites	Cover all vehicles carrying loose materials with tarpaulin; avoid overloading and ensure proper loading/unloading to prevent spillage.
Stone crushing, batching, and asphalt plants	Locate plants at least 500 m from settlements and sensitive receptors; install dust extraction, bag filters, and stack emission controls. Regularly maintain equipment to minimize emissions.
Site clearing, vegetation removal, and handling of topsoil	Restrict vegetation clearance to the required RoW; immediately stabilize exposed soil using mulching, water spraying, or temporary turfing.
Concrete and asphalt mixing operations	Use pre-mixed bitumen and maintain mixing temperature within permissible limits to reduce hydrocarbon release. Avoid fuel adulteration.
Operation of heavy machinery and transport vehicles	Maintain all equipment and vehicles regularly; prohibit use of old or poorly maintained machinery; use low-sulphur fuel.
Generation of gaseous pollutants (SO ₂ , NO _x , CO)	Ensure all machinery meets CPCB emission norms; prohibit idling of vehicles; schedule material transport to avoid congestion.
Worker and community exposure to dust and fumes	Provide PPE (dust masks, goggles) to workers; display warning and awareness signs; avoid high-emission activities near schools or dense settlements.
Monitoring and compliance	Conduct periodic ambient air quality monitoring (PM ₁₀ , PM _{2.5} , SO ₂ , NO _x , CO) at identified locations and ensure compliance with CPCB National Ambient Air Quality Standards.

5.4.2.6 NOISE (ESS3)

The scale of the construction necessary to upgrade the road and the corresponding slight increase in traffic is not expected to generate adverse impacts.

During construction, particularly in residential and commercial areas, ambient noise levels may temporarily exceed statutory limits within about 50 m of active work zones due to operation of heavy machinery, material transport, and equipment use. The main noise sources will include excavators, graders, vibratory rollers, and transport vehicles, which typically generate levels above 70 dB (A). Vibration from rollers may also affect nearby structures depending on soil type, structural age, and construction quality.

These impacts will be intermittent, short-term, and localized, as all construction activities will not occur simultaneously along the corridor. Sensitive receptors such as schools, hospitals, and religious places located near the project road may experience temporary disturbance during high-noise activities. However, impacts will attenuate with distance and can be effectively mitigated through equipment maintenance, scheduling of high-noise works during day time, and strict adherence to CPCB noise standards.

The scale of construction required for upgrading the AP Road is moderate and confined mostly within the existing Right of Way (RoW). The primary sources of noise emissions include construction equipment, material transport vehicles, stone crushers, and asphalt plants. These activities are temporary, localized, and limited to the construction period. Noise levels are expected to rise intermittently during operations such as excavation, compaction, and pavement laying, especially near settlements and sensitive receptors like schools and health centers. However, with proper scheduling of high-noise activities during daytime, maintenance of equipment, and adherence to CPCB noise standards, the impacts will remain within acceptable limits. Consequently, the overall scale of works and the expected marginal increase in post-construction traffic are not anticipated to result in any significant or lasting adverse impacts on ambient air quality or noise levels.

Ambient noise level may increase temporarily in the close vicinity of various construction activities, maintenance workshops, and vehicles and earthmoving equipment. These construction activities are expected to generate noise levels in the range of 80 – 95 dB(A) at about 5m from the source.

MITIGATION MEASURES

- Staging of construction equipment and unnecessary idling of machinery within noise-sensitive areas shall be avoided wherever possible.
- All plants and equipment used in construction (including third-party units) must conform to MoEF&CC/CPCB noise standards.
- All vehicles and equipment used in construction shall be fitted with effective exhaust silencers.
- Servicing of all construction vehicles and machinery shall be done regularly; during routine servicing, the effectiveness of exhaust silencers shall be checked and replaced if defective.

- Construction activities shall be restricted to daytime hours (6 AM–10 PM). Night-time work may be carried out only in emergencies, following all prescribed mitigation measures for night operations.
- Unnecessary honking at construction sites shall be strictly prohibited.
- Temporary barricading shall be installed around active construction zones, especially near settlements, schools, or hospitals, to minimize noise propagation.
- Noise monitoring shall be carried out at construction sites as per the approved monitoring schedule, and results shall be submitted to the Project Management Consultant (PMC) and Project Management Unit (PMU) for review and compliance verification.

DG SET NOISE CONTROL STANDARDS

To minimize noise from generator operations during construction, the following measures shall be implemented:

- The contractor must use silent DG sets as prescribed by the Central Pollution Control Board (CPCB).
- If a silent DG set is not available, noise shall be controlled by providing an acoustic enclosure or acoustically treated housing.
- The acoustic enclosure shall be constructed with suitable materials of adequate thickness, supported by a structural or sheet-metal base, and insulated with fire-retardant acoustic foam.
- The acoustic enclosure/acoustic treatment shall be designed to provide a minimum 25 dB(A) insertion loss or to meet ambient noise standards, whichever is higher.
- Each DG set shall be provided with a proper exhaust muffler to further reduce noise emissions.
- The DG set shall be properly sited to minimize its noise impact beyond the premises, ensuring compliance with ambient noise standards at the nearest receptor.
- A routine and preventive maintenance schedule shall be prepared and followed in consultation with the DG set manufacturer to ensure that noise levels do not deteriorate with use.

At the outset, it should be noted that unavailability of exact information on the construction methodology, hours of work, no. of equipment and their ratings / fuel consumption, construction schedule, etc. are the limiting factors while estimate the construction noise for this subject project;

5.4.2.7 SURFACE WATER QUALITY AND SILTATION (ESS3)

Construction activities such as earthworks, material storage, and operation of construction camps may temporarily affect surface water quality along the AP Road corridor. Proposed sub project road run parallel to Daru river Chainages, 25+000. Earth Runoff from exposed soil surfaces, stockpiles, and construction zones can carry suspended solids, oils, and debris into nearby streams or drainage channels, leading to increased turbidity and siltation. Additionally, improper disposal of construction wastewater or accidental spills of fuels and lubricants may also contribute to localized water pollution. Fishing is practiced in the Daru River, which intersects the AP Road corridor. Construction activities such as bridge works, river training, and slope protection may temporarily increase turbidity and sediment load in the river, potentially affecting local fish habitats and water quality. These effects are expected to be localized and short-term, primarily during active construction near the river crossing.

Labour camps and site facilities will generate domestic wastewater and sewage, which, if discharged untreated, may degrade nearby water bodies.

Mitigation measures

- To prevent this, sewage treatment through septic tanks and soak pits or mobile bio-toilets shall be provided at all camps.
- Construction runoff shall be managed through temporary drainage channels, sediment traps, and silt fencing, ensuring that no untreated discharge enters natural watercourses.
- With proper implementation of drainage control, containment of oil and grease near equipment yards, and treatment of domestic wastewater, no significant or long-term impact on surface water quality or aquatic habitats is anticipated during the project construction and operation phases.
- Proper implementation of erosion and sediment control measures including silt fencing, and controlled work scheduling will minimize such impacts.

Mitigation Measures for Groundwater Protection (Pile/Material Storage Areas)

- **Site Selection:** Locate material and pile storage yards at least 100 m away from water bodies, wells, or natural drainage channels. Avoid low-lying or flood-prone areas.
- **Impervious Flooring:** Provide impermeable flooring (e.g., compacted clay or concrete base with HDPE lining) in storage areas for materials such as bitumen, fuel, cement, and chemicals to prevent seepage into soil and groundwater.
- **Storm water Management:** Construct peripheral drains around storage yards to collect and divert runoff to sedimentation pits before discharge. Prevent mixing of clean storm water with contaminated runoff.
- **Spill Prevention and Control:** Store fuel and lubricants in bunded areas (110% capacity of the largest container) with proper spill kits (sand, absorbents). Immediately clean up any spills or leaks.
- **Topsoil and Excavated Material:** Store topsoil separately on raised and covered platforms to prevent erosion and sediment-laden runoff into groundwater recharge zones.
- **Waste and Debris Management:** Prohibit dumping of construction waste, oils, or concrete slurry on bare ground. Dispose of waste only at approved sites.
- **Regular Inspection:** Conduct routine checks for leakages, cracks, or improper containment in fuel and chemical storage zones.

IMPACTS ON NATURAL DRAINAGE AND WATERSHED MANAGEMENT (FLOODING) (ESS3)

Along the rivers and streams crossed by the road, there is a need for bank protection measures to avoid accelerated sedimentation that can affect drainage patterns as well as riverine habitats. The alignment follows the existing topography except for the location of the cross-drainage structure. 10 Junction and 01 Major bridge & 6 Minor Bridge exists in the project area of 08 km road length. Totally 45 culverts are proposed for new construction, reconstruction/retention.

If the existing culverts are not adequately strengthened during road widening and rehabilitation, they may fail structurally, leading to disruptions in water flow, increased flood risk, potential damage to the road, and safety hazards for road users and nearby communities.

5.4.2.8 GROUND WATER QUALITY (ESS3)

The road construction projects are water intensive and demand a large volume of water during the entire project's construction period however in this project the works are rehabilitation in nature, the quantum of water require will be minimal. However surface water AP project road stretch will require 22.91 Cum/day. Although the actual water requirement may vary depending on the contractor's construction methodology and equipment usage. As discussed with the DPR team, the primary source of water for construction will be the Daru River. The availability of surface water is sufficient. Hence demand for the construction is proposed to be met from the surface water sources. The demand for construction is proposed to be met from surface water sources. The project area is not classified as critical, semi-critical or overexploited by CGWB. It is "safe" area for ground water abstraction.

There is no pressure on ground water resources as most of the water requirement will be fulfilled by surface water.

5.4.2.9 CONSTRUCTION AND DEMOLITION WASTE (ESS3)

Construction and demolition (C&D) waste from major demolitions is not expected along the proposed AP alignment because no permanent structures will be removed. Only temporary structures with masonry or light walls (e.g., temporary kiosks, sheds, boundary walls) will be dismantled where absolutely necessary to establish the right-of-way. Even these limited removals, if not handled correctly, can obstruct natural drainage, cause siltation of nearby water bodies, generate dust, and create temporary traffic inconveniences or health nuisances. To avoid such impacts, all temporary-structure debris will be managed through a contractor-led waste handling plan that emphasizes source segregation, timely removal, reuse/recycling where feasible, controlled transport, and disposal at authorized sites.

Key mitigation measures

- **Avoidance & minimization:** limit removals to only those temporary walls/structures that are unavoidable for construction; explore minor realignments or temporary protection works to retain structures where possible.
- **Segregation on site:** separate inert masonry/brick, concrete, metal, wood and mixed waste at designated temporary collection points to maximize reuse/recycling.
- **Reuse & recycling:** priorities reuse of intact masonry/brick and concrete as backfill or for temporary access tracks; recover metal and timber for reuse.
- **Designated storage & timely removal:** store debris in covered areas away from drains and surface water; remove to authorized disposal/recycling facilities within agreed short timeframes to prevent runoff and scavenging.
- **Dust control:** dampen stockpiles and vehicle loads, cover trucks during transport, and restrict demolition/dismantling operations during high-wind conditions.
- **Drainage protection:** install silt traps/sediment control (e.g., sandbags, temporary settling pits) at nearby drains and around stockpiles to prevent siltation of water bodies.
- **Traffic & public safety:** schedule dismantling works off-peak where possible, use flaggers and signage, and maintains clear pedestrian/vehicular passage around work areas.

- **Permits & authorized disposal:** ensure waste is transported only to licensed C&D disposal or recycling facilities and that manifests/receipts are retained.
- **Contractor responsibilities & training:** the contractor shall prepare the C&D waste handling plan, train workers on segregation and pollution prevention, and maintain daily records of waste quantities and destinations.
- **Monitoring & reporting:** include C&D waste management in construction supervision checklists; undertake fortnightly inspections and submit waste disposal receipts as part of monthly compliance reports.

5.4.2.10 MUNICIPAL SOLID AND HAZARDOUS WASTE (ESS4)

AP road corridor will generate approximately 10 to 12 kg of municipal solid waste per day during the construction stage, this is estimated based on approximately 18 working people in the project site. This waste if not disposed of properly, may lead to littering in the immediate vicinity of the camp sites and contamination of ground water as well as air pollution due to unauthorized burning.

Mitigation measures

- Disposal of sanitary wastes and excreta shall be into septic tanks. If bio-toilets will be used the excreta could be converted to manure.
 - Kitchen wastewater shall be disposed into soak pits/kitchen sump located preferably at least 15 m from any water body. Sump capacity should be at least 1.3 times the maximum volume of wastewater discharged per day. The bottom of the pit should be filled with coarse gravel and the sides shored up with board, etc. to prevent erosion and collapse of the pit. New soak pits shall be made ready as soon as the earlier one is filled.
 - Solid wastes generated in the kitchen shall be reused if recyclable or disposed of in landfill sites.
 - Provide segregated garbage bins in the camps and ensure that these are regularly emptied and disposed of hygienically as per the Comprehensive Solid Waste Management Plan approved by the Environmental Expert of Project Authority.
- a) The camping area should be periodically sprayed with Bleaching powder and other
- Disinfectants.

Approximately 40 cu.m.of scarified bituminous material will be generated from the project road during pavement rehabilitation. Improper disposal may cause localized soil and water contamination due to leaching of hydrocarbons; therefore, its reuse and handling shall follow MoRTH (5th Revision) guidelines.

As per MoRTH Clause 517 and Clause 305.2.2.2, the scarified bituminous material shall be recycled and reused in Granular Sub-Base (GSB), Wet Mix Macadam (WMM) layers, or for pavement shoulders, after appropriate screening and blending to achieve the required gradation. The reclaimed mix can also be incorporated in hot or cold recycling processes depending on site conditions and equipment availability.

Any quantity of scarified bitumen found unsuitable for reuse shall be disposed of at designated locations approved by the Engineer-in-Charge, with proper base lining and containment to prevent leachate migration and protect soil and water quality. This approach promotes resource recovery, cost efficiency, and environmental compliance in line with MoRTH and CPCB sustainability principles.

Corridor wise scarifying existing bituminous surface in the project area is listed in **Table 5.4** below.

Table 5.4: Amount of Scarified Bituminous waste

Sl. No.	Description	Unit	Quantity
1.	Scarifying existing bituminous waste	cum	40

A small quantity of hazardous substances (such as diesel, petroleum products, and other chemicals) will be used or stored during the project. If not stored properly, these substances may cause leakage or spillage, leading to soil and water contamination. During the construction phase, used batteries are also likely to be generated, which must be disposed of in compliance with the Battery Waste Management Rules, 2022. Improper disposal of lead-based batteries can result in leakage of lead, causing soil and water pollution.

5.4.2.11 NATURAL DISASTER (ESS4)

Along the AP Road, issues of flooding or water logging were observed. However, certain locations were identified as potentially vulnerable to such conditions due to their proximity to riverbanks and hydraulic structures. At chainage 20+500, soil erosion was noted near the riverbank, indicating possible impact from floodwater or high river flow, necessitating protection work. Similarly, between chainage 21+200 and 21+300 on the left-hand side, erosion along the riverbank suggests potential risk of inundation or waterlogging during heavy rains, for which suitable bank protection measures are recommended. At chainage 23+850, erosion was observed at the abutment location of a minor bridge, which could be attributed to scouring caused by flood flow, requiring protective works at the abutment section. Further, at chainage 25+000, soil erosion was observed along the left riverbank, indicating the need for river training measures to mitigate potential flood-induced damage. Proper side drains, erosion control measures, and routine maintenance will ensure effective storm water discharge and protection of adjacent settlements.

5.4.2.12 DISRUPTION OF COMMUNITY SERVICES (ESS4)

During road construction, local infrastructure such as water supply lines, irrigation channels, drainage systems, and access roads may be affected. These facilities are essential for domestic water use, agricultural activities, and community mobility. Improper or incomplete restoration of these services can lead to adverse impacts on local livelihoods and may also affect the integrity and progress of the road works.

5.4.2.13 DIVERSION OF TRAFFIC (ESS4)

Since the road up gradation works will be on the existing road only, therefore there will be direct interface with the road traffic. The Short-term impacts associated with the project will be traffic diversion and management during the construction phase. Construction activities will cause hindrance to the existing traffic flow. There is a possibility of accident hazards during the construction phase of the project. It needs to be mentioned that though there are no direct impacts on the natural environment due to disruption/diversion of such services, diversion can also lead to adverse impacts, if not planned properly. Rapid restoration of diverted services can help in minimizing the severity of impacts arising out due to diversions of existing services.

5.4.2.14 IMPACTS ON OCCUPATIONAL HEALTH & SAFETY (ESS2)

During the construction phase of the road project, workers are continuously exposed to various occupational and environmental hazards. These include prolonged exposure to dust and gaseous emissions from equipment, vehicles, and material handling. Specific risks also arise from working near waterlogged or submerged sections, culvert and

bridge construction, and sharp curves or junction improvements, where vehicular movement poses added danger. Electrocution, work at heights, slips, trips, and falls, as well as tree cutting and vegetation clearance, further contribute to potential safety concerns. Proper use of personal protective equipment (PPE), adherence to standard operating procedures (SOPs), traffic and work-zone safety management, and regular safety training will be critical to prevent accidents and ensure worker well-being throughout the construction period.

Table 5.5 Hazard analysis as per DPR

Activity / Task	Potential Hazards	Associated Risks / Impacts	Proposed Mitigation & Control Measures	Responsible Agency
Site clearance and earthwork (excavation, grading)	Cave-ins, slope failure, dust inhalation, contact with sharp objects	Injury from collapsing sides, respiratory issues, cuts and bruises	<ul style="list-style-type: none"> Use proper shoring and benching of excavations Restrict unauthorized entry- Provide dust masks and PPE Regular inspection of slopes and trenches 	Contractor / Site Engineer
Operation of heavy machinery (excavator, roller, grader, paver)	Machine entanglement, collision, vibration, noise	Physical injury, hearing loss, fatigue	<ul style="list-style-type: none"> Only trained operators Maintain equipment regularly Use reverse alarms, lights, and mirrors Use ear protection and seat belts 	Contractor / Safety Officer
Material handling and lifting (manual or crane use)	Dropped loads, back injuries, entanglement	Fractures, strains, crushing injury	<ul style="list-style-type: none"> Inspect lifting equipment and slings Train workers on safe lifting techniques Use tag lines and certified riggers- Prohibit standing under suspended loads 	Contractor / Safety Supervisor
Asphalt and hot mix plant operation	Burns, inhalation of fumes, fire hazard	Thermal burns, respiratory irritation	<ul style="list-style-type: none"> Use heat-resistant gloves, long sleeves Maintain fire extinguishers near site Ensure good ventilation- Prohibit smoking near bitumen storage 	Plant Operator / Safety Officer
Working near traffic / along existing road	Collision with moving vehicles, poor visibility	Fatal accidents, severe injuries	<ul style="list-style-type: none"> Implement Traffic Management Plan- Install warning signs, cones, and barricades 	Contractor / Traffic Marshal

			<ul style="list-style-type: none"> Assign flagmen with high-visibility vests- Restrict work to off-peak hours 	
Construction at height (culverts, retaining walls, bridges)	Fall from height, falling tools or materials	Fractures, head injuries, fatalities	<ul style="list-style-type: none"> Use full-body harnesses and guardrails- Provide safety nets and helmets Secure tools with lanyards- Supervise work at height 	Contractor / Safety Officer
Welding, cutting, and concreting works	Electric shock, eye injury from sparks, burns	Eye irritation, electrocution, burns	<ul style="list-style-type: none"> Provide face shields and gloves Ensure proper earthing of welding sets Keep fire extinguishers nearby- Maintain distance from flammable material 	Contractor/ Electrical Supervisor
Fuel and chemical storage / handling	Fire, explosion, spillage	Groundwater contamination, burns, inhalation	<ul style="list-style-type: none"> Store in bunded area with 110% capacity- Provide spill kits and fire-fighting equipment Train staff on spill response- Maintain MSDS at site 	Contractor / Store In-charge
Labour camp and sanitation facilities	Poor hygiene, contaminated water, waste mismanagement	Disease outbreak, worker illness	<ul style="list-style-type: none"> Provide potable water (≥5 L/person/day)- Maintain toilets and waste bins Regular disinfection and waste removal- Conduct health check-ups 	Contractor / Camp Supervisor
Noise and vibration from machinery / DG sets	Prolonged exposure to high noise levels	Hearing loss, stress, fatigue	<ul style="list-style-type: none"> Use silencers and acoustic enclosures- Restrict operation to daytime Rotate workers and provide ear protection- Monitor noise levels regularly 	Contractor / Environmental Officer
Electrical works (temporary wiring,	Short-circuit, electrocution	Shock, burns, fire	<ul style="list-style-type: none"> Use insulated tools and cables- Regular 	Contractor /

lighting)			inspection of wiring <ul style="list-style-type: none"> • Provide ELCB protection- Only certified electricians to handle work 	Electrical Supervisor
Extreme weather conditions (rain, heat)	Slippery surfaces, heat stress, dehydration	Falls, injuries, fatigue	<ul style="list-style-type: none"> • Schedule work during cooler hours- Provide shaded rest areas • Supply drinking water and electrolyte drinks- Stop work during heavy rainfall 	Site Engineer / Safety Officer
Waste and debris disposal	Sharp objects, dust, unstable mounds	Cuts, respiratory irritation	<ul style="list-style-type: none"> • Segregate and reuse materials- Dispose at approved sites • Cover trucks during transport- Provide gloves and masks 	Contractor / Site Engineer

5.4.2.15 WORK SITE SAFETY (ESS2)

Construction site safety is one of the most overlooked things during a construction project. In most workplaces accidents are common due to lack of work site safety. Accidents have the potential to be life-threatening and can be avoided through proper Work site Safety. The likely hazardous materials to be transported or stored on-site which includes diesel, petrol, oils for machinery, explosives for blasting in rocky terrains (if required), cement and lime (which can cause respiratory issues if inhaled), bitumen (flammable and can cause burns), solvents and paints (volatile and toxic). Accidental leaks or exposure of hazardous materials can harm local flora and fauna. Lack of PPE and safety training increases the likelihood of accidents and health issues for workers handling hazardous materials. A project level Worksite Safety Plan (OHS plan) has been prepared as a separate document which outlines the various impacts and strategies to manage them.

5.4.2.16 ROAD SAFETY MEASURES (ESS4)

Road construction activities may temporarily affect the safety of commuters, pedestrians, students, women, and elderly people. However, with proper planning, safety measures such as signage, speed control, and awareness campaigns can significantly reduce risks and improve road user protection. While the project stretch is not affected by landslides, minor issues like water logging can be addressed effectively through drainage improvements and culvert construction, thereby enhancing long-term road usability. Although animal crossings have not been reported in the area, incorporating precautionary measures in the Contractor's C-ESMP will ensure readiness and strengthen the road's environmental safety. Overall, the project offers an opportunity to create a safer, better-drained, and more resilient roadway for all users.

5.4.2.17 ANTICIPATED IMPACTS ON BIOLOGICAL ENVIRONMENT (ESS6)

The Ampati to Purakhasia Road (AP) Road project is a road improvement activity confined to the existing alignment, with no widening or diversion through undisturbed habitats. Although several Endangered and Critically Endangered species occur regionally within the 10 km Study area, the project does not intersect or significantly influence any critical habitat as defined under World Bank ESS6 Paragraph 27–29. Hence, no species or habitat within the project's area of influence qualifies as Critical Habitat. All species are therefore screened out from Critical Habitat consideration. The summary of Critical habitat analysis is summarized in Table 5.6 below..

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Table 5.6: Critical Habitat analysis

Scientific Name	IUCN Status	Restricted Range	Migratory / Congregatory	Habitat & Distribution	Likelihood in Project Area	Rationale	Screened In / Out
Hoolock hoolock (Western Hoolock Gibbon)	EN	Yes	Non-migrant	Evergreen forests of Garo Hills	Moderate	Forest exists, but road works do not involve major tree cutting	Out
Manis pentadactyla (Chinese Pangolin)	CR	Yes	Non-migrant	Forested slopes	Moderate	May occur, but no excavation in core habitat	Out
Nycticebus bengalensis (Bengal Slow Loris)	EN	No	Non-migrant	Dense forest edges	Low–Moderate	Works limited to existing ROW; no habitat loss	Out
Sarcogyps calvus (Red-headed Vulture)	CR	No	Congregatory	Open forests & settlements	Low–Moderate	No nesting cliffs or congregation sites present	Out
Gyps bengalensis (White-rumped Vulture)	CR	No	Congregatory	Forest edges and rural landscapes	Moderate	Foraging species; no significant nesting sites affected	Out

CR: Critically Endangered, EN : Endangered

Mitigation Measures for Biodiversity Management

The proposed Ampati to Purakhasia Road (AP) Road improvement project passes through a modified landscape interspersed with secondary vegetation, agricultural fields, and small forest patches. Although no critical habitat is present, the area supports regionally important biodiversity. To minimize ecological impacts during project implementation, the following mitigation and enhancement measures will be adopted.

PRE-CONSTRUCTION PHASE

- **Biodiversity Awareness and Training:** Conduct orientation and awareness programs for workers and contractors on local biodiversity, wildlife protection, and the importance of avoiding hunting, poaching, or collection of forest products.
- **Tree Inventory and Compensatory Plantation:** Carry out a detailed tree inventory within the RoW before clearance and undertake compensatory plantation at a ratio of **1:3 or as prescribed by the Forest Department** using native species.
- **Avoidance of Sensitive Areas:** Restrict construction camps, material storage, and waste disposal away from forest patches, streams, and wildlife movement zones.

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- **Scheduling of Works:** Plan vegetation clearance outside the local breeding and nesting season (typically March–June).

CONSTRUCTION PHASE

- **Habitat Protection and Minimization:** Limit vegetation removal strictly within the approved RoW. Retain mature trees wherever technically feasible and avoid any activity in adjoining forest areas.
- **Noise and Vibration Control:** Restrict high-noise activities (e.g., blasting, piling) near forested stretches and avoid construction during early morning or night hours.
- **Prevention of Poaching and Wildlife Disturbance:** Strictly prohibit hunting, trapping, or feeding of wild animals by construction personnel; penalties and dismissal for violations will be enforced.
- **Pollution and Waste Management:** Ensure proper collection and disposal of construction waste, oil, and bituminous materials to prevent contamination of nearby soil and water bodies.
- **Lighting Management:** Use downward-facing, low-intensity lights near forested or sensitive zones to reduce disturbance to nocturnal species.

OPERATION PHASE

- **Habitat Restoration and Plantation Maintenance:** Maintain and monitor compensatory plantations for at least **three years**, ensuring survival of at least 80% of planted saplings.
- **Community Awareness:** Promote awareness among local communities and drivers regarding safe wildlife passage and importance of biodiversity conservation.

5.4.2.18 IMPACTS ON AQUATIC ECOLOGY

Impacts on Aquatic Ecology:

During the construction phase, aquatic ecology may be affected by increased silt inflow into surface water bodies and the discharge of liquid wastes or untreated sewage from construction and labour camps.

Mitigation Measures:

- Proper drainage channels and waste management systems will be established at construction sites.
- Labour camps will be equipped with septic tanks or mobile toilets to prevent direct sewage discharge into nearby water bodies.
- Disposal of construction material or debris into rivers, streams, or ponds will be strictly prohibited.
- Regular monitoring of water quality will be conducted to ensure compliance with environmental standards

Environmental impacts such as soil erosion at 20+500 and riverbank erosion (21+200 to 21+300 LHS) will be addressed through toe wall protection works and river training measures. At 23+850, erosion at the minor bridge abutment will be tackled with protection works. Soil erosion at 25+000 (LHS) will be managed through river training works. Details are given below.

Chainage	Issue / Environmental	Type of Work	Detailed Design Interventions / Description
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(km)	Impact	Envisaged	
20+500	Significant soil erosion near riverbank due to active scouring	Riverbank protection & erosion control	<ul style="list-style-type: none"> • Construction of RCC/stone masonry toe wall with adequate embedment below bed level • Provision of riprap/stone pitching over geotextile to arrest scouring • Installation of launching apron for riverbank stability • Vegetative turfing/vetiver grass plantation on upper slopes for long-term protection
21+200 – 21+300	Soil erosion along LHS riverbank indicating continued instability	Bank stabilization & slope protection	<ul style="list-style-type: none"> • Construction of gabion revetment or stone pitching along affected stretch • Regrading of bank slope to stable profile with compaction • Provision of geotextile filter layer to prevent soil loss • Use of vegetative bio-engineering measures (coir matting, grassing)
23+850	Soil erosion at abutment location of minor bridge, posing structural risk	Bridge abutment protection works	<ul style="list-style-type: none"> • Construction of RCC toe wall and cutoff wall at abutment • Provision of riprap apron or gabion mattress for scour protection • Backfill protection using filter media and geotextile • Strengthening of abutment slope using stone pitching or gabion baskets
25+000	Soil erosion along LHS riverbank, loss of embankment material	River training & embankment protection	<ul style="list-style-type: none"> • Construction of river training structures such as spurs/groynes to deflect flow • Provision of gabion/masonry retaining wall where embankment is threatened • Placement of rock riprap over geotextile to prevent further erosion • Vegetative stabilization on upper bank with bio-engineering methods

To address the potential impacts on biodiversity, a comprehensive set of mitigation measures have been developed and incorporated into the ESMP.

During the operation stage, no significant impacts are anticipated, as rivers and ponds within the ROW are not expected to be adversely affected. With these safeguards, no negative impacts on aquatic ecology are envisaged in the operational phase.

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5.4.2.19 IMPACTS ON ARCHAEOLOGICAL, HISTORICAL AND CULTURAL SITES (ESS8)

There are no historical and cultural sites of importance observed in the project stretch.

The other key potential impacts during the construction of the Project may be related to the risk of partial or total removal or destruction of unknown heritage assets (undiscovered archaeological sites) due to ground removal, which implies the need for setting mitigation approach.

During the construction works, as part of the Contractor's project CESMP, a "chance-find" procedure will be developed and implemented. A guidance note for the protocol on the "chance find procedure" is to be incorporated in the indicative ESMP as part of this ESIA. Workers need to be trained in the use of this procedure

5.4.3 IMPACTS DURING OPERATIONAL PHASE

During the operation stage, the main environmental impacts are expected from increased traffic volume and speed, which may elevate safety risks, particularly in rural areas. However, no sudden or significant increase in traffic is anticipated, as the road already exists and is open to public use.

The project also offers opportunities to restore vegetation around the road corridor and worksite through a compensatory plantation program. This initiative will enhance the aesthetic quality of the area and contribute to soil stabilization and reclamation.

5.4.3.1 Impacts on Water Quality and Resources

During the operation phase, the likelihood of water quality degradation is very low. Potential impacts on surface water may arise only from accidental spills. However, the probability of such incidents is minimal, as the road design incorporates safety enhancements, including curve improvements, road widening, and pedestrian facilities, which collectively reduce the risk of accidents.

5.4.3.2 Impact on Air Quality

Vehicular emissions are the principal source of pollution during the operation stage. The AP project road being mostly located adjacent to open agricultural land and un-classed forest, adequate dispersion of gaseous pollutants is expected.

5.4.3.3 Impact on Noise Quality

Impact due to increased noise level and vibration is anticipated due to heavy vehicular movement upon improvement of existing road condition. Road side plantation will act as a noise barrier and is likely to reduce the noise quality during the operational phase and any further mitigation is beyond the control of the project authority.

5.4.3.4 Accidents Involving Hazardous Materials

Accidents involving hazardous chemicals may generally be catastrophic to the environment, though the probability of occurrence is low. Prevention of an accident involving hazardous material is a better way of minimizing the impacts. The provisions mandated by 'The Hazardous Wastes (Management and Handling) rules, 1989 and "Manufacture Storage and import of Hazardous Chemicals Rules" 1989 under the Environmental (Protection) Act, 1986 will be complied with. Vehicles delivering hazardous substances will be expected to have printed warning signs on the vehicles and measures to contain any hazardous spillage on the road.

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In case of spillage, the report to relevant departments will be made and instructions will be followed in taking up the contingency measures immediately as per the Emergency Management Plan of the contractor's OHS plan.

5.5 Social Risks & Impacts (ESS2, ESS4, ESS5 ESS7 and ESS10)

The construction of the road is expected to intersect various areas of significant social and economic value, which necessitates careful consideration and management. Key areas of concern include impacts on agricultural lands, residential communities, and culturally significant sites. The route traverses along agricultural land that are important for local food production, livelihoods and eco system services in general. Disruption to these areas could result in economic losses for farmers and reduced agricultural output. Mitigation measures, including re-alignment, compensation, and access to community benefit programs have been considered to minimize adverse effects and ensure that the project contributes positively to the socio-economic landscape. This has been outlined in the Resettlement Action Plan.

The construction of the AP road is not expected to have significant social impacts on roadside communities. The project aims to minimize social impacts by ensuring that all construction activities are confined within the existing Right of Way (RoW). Approximately 5 structures are expected to be affected by the project and they are present within RoW, including seven temporary shops and residential-related structures, a semi-pucca commercial shed, a staircase, and compound walls. FPIC was carried out as the project will result in loss of asset and cause relocation of IP's.

The road alignment requires minimal additional land requirement, as most mitigation and improvement works are confined within the existing paved road. Key interventions along the alignment include:

- Along the project corridor, several community and institutional structures were observed in close proximity to the proposed alignment. At chainage 23+800, a Government School is located near the road, where appropriate speed reduction measures such as signage and a speed limit of 20 km/h are recommended to ensure student safety. Another educational facility, a Primary School, is located at chainage 25+850, where no direct impact from construction activities is anticipated.
- Religious structures were also identified along the stretch. A Church is situated at chainage 25+200, and another at chainage 27+100; both locations are at a safe distance from the construction zone and thus no impact is expected.
- Additionally, a JJM (Jal Jeevan Mission) facility was noted at chainage 25+300, which will remain unaffected by the proposed works.
- Overall, while schools, churches, and community infrastructure are present along the route, none are likely to be adversely affected, though speed regulation and safety signage near educational institutions are strongly recommended.

Furthermore, the easement zones around the construction areas will potentially cause hindrance on land use, limiting some of the activities such as building construction, tree planting, and certain agricultural practices. These restrictions can disrupt community development plans, hinder local businesses, and affect the overall quality of life for residents.

To mitigate these social impacts, household surveys and extensive meaningful stakeholder consultations were carried out to understand the concerns and needs of affected communities. The Free, Prior, and

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Informed Consent (FPIC) process was followed in culturally appropriate manner to ensure meaningful engagement with Indigenous Peoples, securing their consent through transparent and participatory consultations. Additionally, community engagement programs have been conducted to provide clear information about the project, address misconceptions, and explore opportunities for local benefits, such as job creation and infrastructure improvements.

By ensuring that the road construction remains within the existing Right of Way (RoW) and does not require additional land or impose new easement restrictions, the project aims to minimize social impacts and maintain positive relationships with local communities. Contractors will be required to ensure that existing access ways to public and private amenities are maintained throughout the construction period.

The Project recognizes the critical importance of addressing Sexual Exploitation, Abuse, and Harassment (SEA/SH) both within the workplace and in interactions between workers and the local community. To address these concerns, SEA/SH Prevention and Response Action Plan has been prepared for the project.

5.5.1 SOCIAL COMPONENT ISSUES: IMPACT ON LAND, STRUCTURES AND LIVELIHOOD

Potential Risks & Impacts

The proposed road alignment involves 5 structures. Details of the project affected households have been discussed in section 4.9 of Chapter 4. The culverts, drains, and toe walls are carefully planned to minimize environmental and social impacts. Certain stretches of the road are prone to waterlogging, submergence, soil erosion, and sharp curves; these risks will be effectively managed through mitigation measures such as road raising, drainage improvements, protective walls, curve corrections, and safety signage.

These interventions will not only reduce potential hazards to traffic and nearby settlements but also enhance the safety, durability, and resilience of the road infrastructure during the monsoon season. In sensitive areas, including community vegetation's and elephant passages, the designs ensure minimal disturbance to natural habitats.

Overall, the project reflects a balanced approach, addressing potential environmental and social risks while improving road safety, accessibility, and ecosystem protection. Social impacts will be mitigated in accordance with the RBB Project Road Resettlement Action Plan, Integrated Development Plan (RAP, IPDP) and Environmental and Social Management Plan (ESMP).

To mitigate these risks, the Contractor will implement the following measures:

- Maintain alternative access routes to residences and shops wherever feasible.
- Schedule construction works in a phased manner to minimize disruption.
- Install clear signage and provide advance notice to affected persons about construction schedules and access changes.
- Ensure safe pedestrian pathways and temporary crossings in congested areas.
- Coordinate closely with local communities and shop owners through the Grievance Redressal Mechanism (GRM) to promptly address access-related complaints.

These mitigation measures will be detailed in the Environmental and Social Management Plan (ESMP).

5.5.2 SOCIAL COMPONENT ISSUES: TEMPORARY RESTRICTION TO ACCESS**Potential Risks & Impacts**

Construction activities, including road improvements and extensions, may result in temporary restrictions to access for residents and business owners. Limited or blocked access can disrupt daily commutes and hinder customer access to shops, potentially causing financial losses for local businesses and inconvenience for residents. Such disruptions may also lead to frustration within the community and generate dissatisfaction with the project if not properly managed.

5.5.3 SOCIAL COMPONENT ISSUES: DISRUPTION TO ACCESS ECOSYSTEM SERVICES**Potential Risks & Impacts**

The commencement of construction may intensify pressure on other community resources, potentially leading to resource depletion. Managing this impact requires sustainable resource management practices to ensure villagers continue to have access to essential materials like fuel, food, and building supplies while preserving the forest and other resources for future use.

5.5.4 SOCIAL COMPONENT ISSUES: IMPACT ON VULNERABLE PEOPLE**Potential Risks & Impacts**

Construction projects can disproportionately affect vulnerable and disadvantaged populations such as women-headed households, below-poverty-line families, and the elderly population (60+ years). This has been discussed in Table 4.17 of Chapter 4. These groups may face increased difficulties related to mobility, access to essential services, and overall safety during construction activities. Failure to adequately address their unique needs can exacerbate existing inequalities and lead to additional social and economic challenges. There can be difficulty for the community to reach the nearby hospital when road construction is on-going.

To address these risks, the following measures will be implemented:

- Ensure continuous access to essential services, particularly healthcare and educational institutions, through alternate routes or temporary walkways.
- Provide advance information to communities regarding construction schedules, traffic diversions, and safety measures through local notice boards and community meetings.
- Establish priority crossing points and temporary access for elderly persons, school children, and differently abled individuals.
- Engage local women's groups, self-help groups, and village councils in monitoring safety and access conditions during construction.
- Maintain a functional Grievance Redress Mechanism (GRM) to ensure that concerns from vulnerable groups are addressed promptly and effectively.

Amenities for Indigenous Peoples (IPs) residing in road project such as Toilets, waiting sheds etc. have been incorporated under the Indigenous Peoples Development Plan (IPDP), which builds upon the outcomes of the consultations and Free, Prior, and Informed Consent (FPIC) process conducted with the affected communities. Furthermore, continuous engagement with IP and other vulnerable groups will be maintained throughout the project implementation phase through the Stakeholder Engagement Plan

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(SEP), which provides for inclusive communication, regular disclosure of project information, and responsive community feedback mechanism.

5.5.5 SOCIAL COMPONENT ISSUES: INFLUX OF MIGRANT LABOR

Impact of Labor Influx

Poor behavior by workers from outside, in sub-project areas can lead to disruption of local community cohesion, especially smaller communities. This can occur through unaccustomed or violent behavior, including gender-based violence, and/or an increase in communicable diseases.

There is potential for an increased risk of the spread of communicable diseases and increased rates of illicit behavior and crime resulting from the worker influx, however, the volume and skilled nature of the incoming workforce reduce this likelihood.

Gender based violation

Despite being a predominantly matrilineal society, Meghalaya has recorded a worrying upward trend in reported crimes against women. According to the Government of Meghalaya's Gender Statistics 2023 publication, total registered cases of crimes against women rose from 237 in 2020 to 287 in 2021.

According to the "Gender Statistics 2023" report for Meghalaya, South West Garo Hills has 9 cases" in relation to suicide deaths in 2021. Crime against women in South West Garo Hills appears relatively low in reported numbers (23 in 2021), but this may not reflect the full picture due to underreporting — especially in rural or remote areas.

Historical rape data (3 cases in 2012–13) confirms low absolute numbers, but stigma, infrastructural barriers, or lack of trust in law enforcement could suppress reporting. State-wide, crimes against women have been rising significantly: from 255 cases in 2012 to 685 in 2021. GBV action plan has been prepared and attached as **Annexure 5.4**.

Consultations were held with communities residing along the project road, utilizing the Free, Prior, and Informed Consent (FPIC) process to understand their needs and challenges & to seek their consent. These consultations highlighted critical issues in basic accessibility, including education, healthcare, and markets, emphasizing the need for improved road infrastructure. While most villages have sanitation facilities, some lack adequate toilet facilities. Education access is limited in certain areas due to the absence of high schools and public transportation, making travel to schools difficult. Similarly, medical facilities exist but are often inaccessible due to transportation constraints, underscoring that essential services, though available, remain out of reach for many community members without improved transport options.

The risk associated with labour influx for the project is expected to be moderate, as workers from outside may be required and will stay on-site during the construction phase. This could potentially cause some discomfort for the local community, particularly for women and children living in the surrounding areas.

Although the road spans over hilly terrain, regular supervision can be done during the construction phase which reflects a positive perspective of the project. Also, during the construction phase, access to the schools would be provided. The project would be equipped with monitoring indicators for GBV and SEA/SH risks along with the avoidance of proximity of female workers with the male workers mandated to be implemented by the contractors. This is outlined in the site specific ESMP and the SEA/SH Action Plan.

5.5.6 SOCIAL COMPONENT ISSUES: LABOR AND WORKING CONDITIONS

Challenges may arise in finding workers while balancing community expectations for local employment opportunities. Local communities may oppose hiring external workers, preferring that job opportunities remain within the local population. Further, there may be risks related to working conditions, terms and conditions of employment, occupational health and safety, discrimination and equal opportunity of all employees. The project level Labour Management Procedure (LMP) and Work site safety plan (OHS Plan) outlines strategies for managing these risks. Labour Management Plan is attached as attached as **Annexure 5.2**. Occupational Health and Safety plan is attached as **Annexure 5.3**.

5.5.7 SEA/SH IMPACTS

The Project recognizes the critical importance of addressing Sexual Exploitation, Abuse, and Harassment (SEA/SH) both within the workplace and in interactions between workers and the local community. Measures to address these risks are outlined in the ESMP and the SEA/SH Prevention and Response Action Plan.

According to the World Bank's GBV risk categorization, the "Moderate" risk category falls within a score range of 13 to 16. **Annexure 5.4** illustrates the project's risk categorization as "Moderate," with Corridor 8. GBV Action Plan is attached as **Annexure 5.5**.

5.5.8 POSITIVE SOCIAL/COMMUNITY IMPACTS

Overall, the proposed road project is expected to have a significantly positive impact on the socio-economic environment. The project will strengthen the existing road through widening, construction of new sections, paved shoulders, and improved drainage. Enhanced access to connecting roads and uninterrupted traffic flow on wider roads will serve as a major stimulus for economic growth, particularly in the rural areas within the sub-project corridor.

During construction, local communities can benefit further if contractors prioritize hiring workers from nearby areas. Efforts should also be made to ensure non-discriminatory employment practices, particularly in the inclusion of women. Over the long term, the project is expected to contribute positively to poverty reduction and overall community development.

5.6 Climate-Related Impact

Meghalaya faces significant challenges from climate change due to its diverse ecosystems, high biodiversity, and socio-economic dependence on agriculture, forestry, and natural resources. The state's unique geographic and climatic conditions make it highly vulnerable to climate-related impacts.

In recent years, the South West Garo Hills has experienced erratic rainfall patterns, with prolonged dry spells and intense monsoon downpours causing water scarcity and flash floods. Rising temperatures have further disrupted ecological balance, affecting agricultural productivity, forest health, and water resources. Additionally, the district is located in **Seismic Zone V**, and the combination of climate-induced hazards and geophysical risks increases its overall vulnerability.

Given these challenges, it is essential to integrate climate mitigation and adaptation strategies into development planning. This approach will help minimize the long-term economic costs of adaptation and capitalize on potential opportunities arising from climate-resilient development. A detailed preliminary

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assessment of climate disaster risks has been undertaken, with further information provided in **Annexure 5.6**. Potential impacts of Climate Change trend on road transport infrastructure is provided in **Table 5.7**.

Table 5.7: Potential impacts of Climate Change trend on road transport infrastructure

Climate Trend / Parameter	Observed Pattern	Impact on Road Infrastructure	Adaptation measures
- High Rainfall Changes in the seasonal and annual average rainfall	Extreme monthly rainfall (2,020.0 mm in 2020). i. Impact on soil moisture levels, affecting the structural integrity of roads, culverts, bridges standing water on the road base ii Risk of flood from runoff, landslides, slope failures and damage to roads if changes occur in the precipitation pattern.	- Increased risk of flooding leading to submersion of roads. - Erosion of road embankments and landslides in hilly terrains. - Structural damage to culverts and bridges. - .	<ul style="list-style-type: none"> • Certain critical sections affected by overland flooding of the road raised (vertical alignment, embankment improvement) to be free from the onslaught of flooding events under intense precipitation. • Road asset survey has considered certain critical road sections where the sub-grade strength and integrity were found to be compromised; the sub-grade strength specification meeting the recent-most IRC specifications has been adopted. • The highest assessment of design discharge for sizing culverts and bridges from among the several discharge methods as outlined in recent IRC guidelines have been adopted. • In terms of floodwater conveyance to prevent stagnation, closed concrete drains in settlement pockets have been provided. • Improved cross-drainage capacities required for the quick conveyance of floodwater by replacing small diameter pipes with box culverts with higher discharge openings has been considered.
Rising Temperatures	Maximum temperature 20°C to 26°C, and night-time lows dipping to 10°C to 15°C	- Higher temperatures cause thermal expansion of road materials, leading to surface cracks. - Softening of asphalt during hot days can cause deformation and rutting.	<ol style="list-style-type: none"> a. An adequate binding layer thickness has been proposed to offset the wear, surface fatigue, and rutting under climate stresses. b. In terms of pavement integrity, the choice of viscosity grade VG30 has been maintained

6. ANALYSIS OF ALTERNATIVES

6.1 Introduction

In line with best practices for managing environmental and social impacts, several alternative approaches have been considered for the proposed road widening and upgrade project. The design is being refined to enhance safety, improve the road structure, and accommodate both current and future traffic demands. This chapter presents an analysis of the potential impacts under the “With Project” and “Without Project” scenarios.

6.2 With and Without Project Alternatives

Alternative analysis was carried out for the project stretch vis-à-vis design scenarios and one scenario of without project. These are described in the following sections.

6.2.1 Without Project Scenario

The road traverses areas with high population densities, particularly in Gambegre Development Block, as well as hilly and rural stretches where traffic is frequently disrupted due to poor road conditions and the demand for efficient through-traffic movement.

The continued growth in population, rising traffic volumes, and expanding economic activity along the corridor are likely to exacerbate the existing challenges. Without the proposed upgrades, current road safety hazards and adverse environmental impacts along the route are expected to persist and worsen. Additionally, the limited socioeconomic development of these remote and underdeveloped areas would remain constrained. Therefore, halting the project would not be practical or justified, as it would impede essential improvements and limit the potential for economic growth in the region.

6.2.2 With Project Scenario

The “With Project” scenario is expected to generate positive long-term impacts across social, environmental, economic, and financial dimensions. Key interventions include widening the existing roadway to intermediate lanes, in line with the project’s objectives.

From an economic perspective, the project is viable and is anticipated to substantially improve current conditions, supporting the development goals set by the Government of Meghalaya and enhancing the region’s growth potential.

While the project promises multiple developmental benefits, it is important to recognize that, like all infrastructure initiatives, it may also result in certain impacts on the environment and local communities.

Potential environmental and social impacts can be mitigated through the adoption of best environmental management and social development practices. Where impacts cannot be fully avoided, suitable mitigation measures will be implemented to minimize and offset adverse effects. A detailed comparison of the “With Project” and “Without Project” scenarios, along with the anticipated benefits of the proposed project, is presented in **Table 6-1** below

Table 6.1: "With and Without" Project Scenarios – A Comparative Assessment

Component	"With" Project Scenario	"Without" Project Scenario
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Component	"With" Project Scenario	"Without" Project Scenario
Highway Geometry	Intermediate lane with shoulder and paved surface is being developed with geometric improvements	Existing Single/Intermediate lane carriageway with poor geometry
Design Speed	(30-50 kmph for Intermediate lane)	30-40 kmph entire project section.
Congestion in Settlements	Improved carriageway with good surface and separated footpath with railing in built-up area reduces interaction of pedestrians with through traffic resulting in reduction of vehicular emissions, reducing travel time and vehicle operating cost. This in turn contributes to lowering of GHG emission; and may improve people/public health due to no or low exposure period.	Lack of road or lack of good road surface with shoulder and foot path, congestion and frequent vehicle stoppage due to mixing of local, pedestrian and through traffic will increase localized accumulation of vehicular emission with potential impacts on human health and contribute to generation of GHG emission.
Felling of roadside trees	Felling of both old and young trees. Old and weak trees near the road edge shall be a road hazard and shall be felled. Ten times of felled trees, the number of new young and healthy saplings to be planted as compensation.	No Felling of trees hence maintaining the healthy local ecology.
Pedestrian safety	Pedestrian facilities in the form of footpath, lightning, etc. are to be provided in built-up area locations.	Lack of dedicated pedestrian facilities such as footpaths and adequate lighting making it unsafe for pedestrians.
Road Safety Measures	Provision of proper road markings, zebra crossings, crash barriers and improvement of geometry to reduce accidents.	Accident incidents will rise with an increased traffic volume.
Environmental Quality	Development of roads in hilly and urban settlements improves environmental quality within the urban areas due to lowered pollution levels and relieving of congestion. Besides, an aggressive tree plantation and provision of enhancement features shall not only provide aesthetics but also improve the quality of air.	Poor in settlement areas due to non-motorable road conditions, congestion and high emission levels because of slow movement of traffic. A further deterioration is expected due to Increase in traffic volumes and further congestion.
Drainage	Will be improved due to reconstruction of culverts / bridges/ side drains with adequate hydraulics.	These issues remain un-addressed without the project
Roadside Amenities	Appropriate roadside amenities to be	Not adequate in the present scenario.

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Component	"With" Project Scenario	"Without" Project Scenario
	provided at various locations along the corridor.	
Wayside Facilities	Wayside facilities are proposed at several locations, where necessary like rest areas, with appropriate facilities for recreation, road public toilets, telephones etc.	Not of adequate standards, quality and number in present scenario.
Environmental Enhancement	Enhancement of landslides/water bodies, community and cultural properties	No enhancement measures involved.
Social Development	Higher potential for social development due to improvement in access and consequent increase in connectivity.	Social development activities are likely to be significantly constrained due to the severe inadequacy of infrastructure.
Financial and Economic Analysis	Project financially viable for upgrading from existing lane configuration to intermediate lane configuration.	The cost of maintenance while catering to the projected higher traffic, accident cost, Vehicle operating cost & travel time cost shall be higher.

6.3 Environmental and Social Alternatives (To Specific Once) Considered For the Proposed Stretch

Various avoidance measures have been developed to minimize environmental and social impacts and to protect sensitive features along the proposed sub-project road. **Table 6.2** summarizes the measures adopted to offset these impacts, and a detailed description of each measure is presented in the following sections.

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Table 6.2: Alternative considerations for Minimization of Environmental Impacts

Chainage (km)	Proposed / Mitigation Measure Adopted	Purpose / Environmental Consideration
20+500	Protection work required at the riverbank due to soil erosion	To prevent further soil erosion and protect riverbank stability.
21+200 – 21+300	Eroding riverbank protection work needed (LHS)	To stabilize riverbank and prevent further erosion on LHS.
22+600 – 23+920	Road improvement	To repair broken road and ensure safe, all-weather accessibility.
23+200	Apron repairing required at culvert location	To restore proper drainage and prevent road damage at culvert.
23+800	Speed reduction measures (20 KMPH)	To reduce vehicular speed and ensure safety near Government School.
23+850	Protection work required at minor bridge abutment	To prevent erosion at abutment and protect bridge structure.
25+000	River training work required due to soil erosion (LHS)	To protect riverbank and maintain road embankment stability.
25+300	Protection work needed at minor bridge; curve improvement	To improve road safety and protect minor bridge section.
25+480	Repair required for big hole	To restore road surface and ensure safe travel.
27+460	Curve improvement needed by reducing curve radius	To enhance road safety and protect nearby building structures.
28+000	Junction improvement by providing traffic islands	To manage traffic flow and reduce congestion at junction.

The Environmental and Social Impact Assessment conducted during the pre-design stage helped identify and mitigate potential negative impacts of the project. While the project is expected to provide numerous benefits, the assessment highlighted potential adverse effects associated with widening the road within the proposed 12 m right-of-way. Along these stretches, roadside communities are likely to be directly and immediately affected by construction activities, potentially experiencing losses of land, assets, and livelihoods. In line with the mitigation hierarchy for managing environmental and social risks, alternative analyses were conducted to minimize direct negative impacts. Based on these analyses, the design team was advised to limit road widening to within the existing right-of-way.

Mitigation measures primarily focus on settlements along the project road, particularly villages and towns or areas with the highest potential impacts. Stakeholder recommendations have been incorporated into the designs wherever feasible.

The following is a summary of the considerations incorporated into the road design to mitigate environmental and social impacts:

- No widening of the road stretch to avoid the significant loss of land, structures and livelihood.
- Curves and Bends will be smoothed out to improve geometric design. Where adjustments may affect local settlements, realignment of the road has been proposed.

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- Paved shoulders will be provided wherever possible to accommodate non-motorized traffic.
- Unnecessary displacement will be avoided by adjusting the alignment, narrowing the impact zone, or tailoring designs to meet both rural and urban cross-section requirements.
- Design speed will be reduced in densely populated areas to enhance safety.
- Impacts on existing shrines and places of worship will be minimized.
- Safety features, including speed control measures near schools and healthcare facilities, will be incorporated.
- Road elevation in settlement areas will be minimized to prevent water seepage into adjacent properties.
- Ensure continuous access to businesses and residential properties throughout the construction period.
- Minimize land clearance to reduce the loss of public and private assets, including wells, tree plantations, and other community resources within the project area.
- A Government School located at chainage 23+800 and a Primary School at 25+850 fall within the project corridor. To ensure the safety of students, speed reduction measures and cautionary signage are recommended near these locations.
- Curve and junction improvement measures are proposed at specific locations along the project road to enhance traffic safety and visibility. At chainage 25+300 and 27+460, sharp curves were observed, where realignment and curve radius improvement are recommended to ensure safe vehicle movement and prevent potential accidents. Additionally, at chainage 28+000, a junction improvement is proposed by providing traffic islands and proper signage to regulate vehicle flow and reduce congestion, ensuring smoother and safer traffic operations.
- Two Churches were identified at chainage 25+200 and 27+100 respectively. Both structures are situated at a safe distance from construction activities, and therefore no direct impact is anticipated in these areas.
- Soil erosion was observed at several locations including 20+500, 21+200–21+300, 23+850, and 25+000, mainly along riverbanks and bridge abutments, indicating the need for protective and river training works. Although no direct water logging was noted, these low-lying and erosion-prone sections are potentially vulnerable to flooding and surface runoff accumulation during heavy rains.

7. STAKEHOLDER CONSULTATION AND INFORMATION DISCLOSURE

This chapter provides an overview of the stakeholder consultations carried out as part of the Environmental and Social Impact Assessments (ESIA) for the proposed Meghalaya Logistics and Connectivity Improvement Project (MLCIP). These consultations were aimed at ensuring a participatory approach to identifying and addressing potential environmental and social impacts associated with the project.

Relevant stakeholders were mapped and can be categorized under three broad categories as shown in below **Table 7.1**.

Table 7.1: List of relevant stakeholders

Category of stakeholder	Type of stakeholder
Project-Affected Parties	<ul style="list-style-type: none"> • Village community • Street side Shop Owners • Shop owners (NTH) • Residential structure owners <p>Nokma</p>
Interested Parties	<p>A. Government agencies</p> <ul style="list-style-type: none"> ▪ Public Works Department (Roads), Meghalaya (PWD-R) ▪ Garo Hills Autonomous District Council (GHADC) ▪ Meghalaya Forests & Environment Department ▪ Meghalaya State Pollution Control Board (MSPCB) ▪ Meghalaya State Biodiversity Board (MSBB) ▪ Land Records & Revenue Department, Meghalaya ▪ Meghalaya State Disaster Management Authority (MSDMA) ▪ Meghalaya Energy Corporation Limited (MeECL) (for electricity & power supply) ▪ Public Health Engineering (PHE) Department (Water supply & sanitation) ▪ Agriculture Department, Meghalaya ▪ Irrigation Department, Meghalaya ▪ Transport Department, Meghalaya ▪ Urban Affairs Department, Meghalaya (instead of Town Committee) ▪ Health & Family Welfare Department, Meghalaya (including AIDS Control Society functions) ▪ Department of Arts & Culture, Meghalaya (instead of Directorate of Archaeology, Meghalaya) ▪ District Social Welfare Office (South West Garo Hills) ▪ District Legal Services Authority ▪ District Child Protection Unit ▪ Office of the Child Development Project Officer ▪ Nokma <p>B. Civil society organizations: Local NGOs such as</p> <ul style="list-style-type: none"> • Civil Society A'chik Welfare Organisation- Based in Ampati, this organization engages in community welfare activities, focusing on the upliftment of the A'chik (Garo) community. • The Social Humanoid- Situated in Garobadha, this organization focuses on social welfare and community development projects.

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Category of stakeholder	Type of stakeholder
	<p>megscpwd.gov.in</p> <ul style="list-style-type: none"> • PA Sangma Foundation- Named after the late Purno Agitok Sangma, this foundation is involved in various development activities, including education and healthcare initiatives. • GHE Global Human Expedition- This organization collaborates with local communities to implement development projects aimed at improving the quality of life. Bethany Society – strong presence of Community based work in the entire Garo Hills Region. • Church-based Organisations (Baptist / Catholic Missions) – significant role in education, health, and social services across villages <p>C. Community based Organization</p> <ul style="list-style-type: none"> ▪ Bio-Diversity Management Committee
Vulnerable groups	<ul style="list-style-type: none"> ▪ Women Headed Household (WHH), ▪ PAPs falling under Below Poverty Line (BPL), ▪ Scheduled Tribe (ST) categories, ▪ Persons with disabilities

During ESIA, consultations were conducted with representatives from all three categories of stakeholders. The consultations conducted with government agencies, communities, & other organizations with representation from vulnerable groups were undertaken. Special attention was given to engaging with communities from sub-project locations that are likely to experience significant impacts, such as impact on residential and commercial structures, impact on common property resources etc. Specific common property resources identified includes religious structures, public utilities, and other community assets critical to local livelihoods and cultural heritage.

Representatives from interested parties were consulted to incorporate their concerns and expertise to align the project with broader developmental objectives associated with economic and environmental goals. Key discussions during the consultations were focused on potential displacement, loss of livelihoods, environmental degradation, law & order issues in project area, forest land related issues, irrigation related, structural issues such as Cross Drainage Structures, etc., and related mitigation measures, ensuring that the concerns and suggestions of all stakeholders were documented and considered in project planning. The consultations provided valuable insights into the priorities and concerns of affected local community, helping to shape mitigation measures for minimizing adverse impacts.

Through public participation in consultations, stakeholder's viewpoints and suggestions were captured as an input to the technical design, which were duly considered, and all the suggestions were incorporated in the project design to the extent feasible and /or warranted.

Additionally, **Annexure 7.1** provides a summary of consultations with project-affected parties from local communities and institutional stakeholders from government agencies.

The project has prepared a project level Stakeholder Engagement Plan (SEP) which details out the procedures of stakeholder engagement during the project cycle. The SEP outlines the process, methods

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and frequency of engagement with various stakeholders and will be accordingly implemented during the project period.

The project has prepared a project level Stakeholder Engagement Plan (SEP) which details out the procedures of stakeholder engagement during the project cycle. The SEP outlines the process, methods and frequency of engagement with various stakeholders and will be accordingly implemented during the project period. Stakeholder Engagement Plan is attached as **Annexure 7.2**.

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7.1 Public Consultation

Public consultations were a key component of the Environmental and Social Impact Assessment (ESIA) process. These consultations were conducted to ensure that the views, concerns, and suggestions of local communities and other stakeholders were effectively considered in project planning and decision-making. The process was guided by the principles of transparency, inclusiveness, and participation, in line with the requirements of the World Bank's Environmental and Social Standard 10 (ESS10) on Stakeholder Engagement and Information Disclosure. Consultations were organized at different stages of the project to inform stakeholders about the project objectives, potential environmental and social impacts, and proposed mitigation measures, while also providing an opportunity for them to share feedback and local insights. The outcomes of these consultations were incorporated into the project design and environmental and social management plans to enhance the project's sustainability and community acceptance.



7.1.1 STAKEHOLDER CONSULTATIONS

Stakeholder consultations formed an integral part of the Environmental and Social Impact Assessment (ESIA) process. These consultations were carried out to ensure that the perspectives, concerns, and expectations of all relevant stakeholders particularly the project-affected persons, IPs, and vulnerable groups were effectively captured and integrated into project planning and decision-making. A total of five consultations were conducted as part of the Environmental and Social Impact Assessment (ESIA) process for the proposed road project. These included two preliminary public consultations, two Focus Group Discussions (FGDs) with youth and one Focus Group Discussions (FGDs) with women.

The details of consultations along the project road is presented in **Table 7.2**.

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
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Sl. No	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
Preliminary consultation						
1	Chopapara	22-08-2025	Local residents	<ul style="list-style-type: none"> Participants appreciated the project and acknowledged its positive impact on the community. Highlighted concerns about non-functional streetlights Requested fair compensation and support in case of any demolitions affecting their properties or livelihoods. 	<ul style="list-style-type: none"> Construct smoother roads to enhance accessibility and improve transportation. Prioritize immediate repairs to address safety and mobility concerns in the community. <p>Ensure fair compensation and support for individuals affected</p>	 <p>Latitude: 25.337388 Longitude: 90.008992 Elevation: 56.12±5.61 m Accuracy: 4.226 m Time: 22-08-2025 13:42</p> <p>Powered by NoteCam</p>
Key Informant Interview						
2	DFO East and North Garo Hill	21-08-2025	DFO	g RoW should be maintained at Community land with vegetation and Elephant passing	While designing the road through community land with vegetation areas and identified elephant passing locations, it is recommended that the existing Right of Way (RoW) be maintained without any additional widening, so as to minimize forest clearance and habitat disturbance. The road should be strengthened and upgraded within the available formation width, with slope protection measures such as bio-engineering and turfing instead	 <p>Latitude: 25.509677 Longitude: 90.599502 Elevation: 286.95±1.04 m Accuracy: 15.03 m Time: 21-08-2025 14:43</p>


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Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
					<p>of concrete structures to retain the natural landscape. At critical elephant crossing points, suitable wildlife-friendly structures such as underpasses or overpasses should be incorporated, along with appropriate signage, speed calming measures, and solar-powered warning systems to alert drivers. Natural drainage patterns must be preserved to avoid waterlogging, and noise-reducing pavement surfaces may be adopted to minimize disturbance to wildlife. During construction, night-time activities and dumping of debris within forest stretches should be strictly prohibited. Further, involvement of the local community in monitoring elephant movement, maintaining eco-friendly roadside plantations, and developing alternative fodder sources will help ensure that road development is balanced with ecological conservation and long-term sustainability.</p>	


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Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
3	PCCF, Shillong	28/8/25	Harish Chaudhry	key issues related to community land with vegetation management and local dependency were highlighted. The seasonal frequency of elephant movement in the project area was discussed, along with potential risks of human–wildlife conflict. The need for appropriate mitigation measures, such as road safety provisions and conservation-friendly design features, was emphasized.	<ul style="list-style-type: none"> Table topping will be done for smooth movement of elephant. <p>Existing RoW should be maintained at community land with vegetation and Elephant passing</p>	



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Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
4	DPR Consultant	26-08-2025	DPR Consultants	<ul style="list-style-type: none"> Preliminary observations from an 8 km site visit were presented, along with information requirements. Current data for Existing Right of Way (EroW) and Proposed Right of Way (ProW) is unavailable. ProW will be considered as 12 meters, in accordance with relevant codes for state highways. <p>A topographic survey has been conducted within a 60-meter width.</p>	<ul style="list-style-type: none"> Incorporate the 12-meter Proposed Right of Way (ProW) into the design to ensure compliance with relevant codes for state highways. Utilize the data from the topographic survey conducted within a 60-meter width to inform the design process and address any topographical challenges. Develop flexible design options that can accommodate variations in the ProW, ensuring that any potential adjustments can be made without significant delays. Integrate drainage solutions into the design to manage water runoff effectively, particularly in areas prone to landslides or flooding. Consider the inclusion of safety features such as guardrails and proper signage to enhance road safety along the newly proposed road alignment. Plan for ecological assessments to ensure that the road design minimizes environmental impacts, especially in sensitive areas identified during the site visit. Allow for future expansion possibilities in the design to accommodate potential increases in traffic volume and road usage over time. Engage with local communities to 	 <p>Latitude: 25.58179 Longitude: 91.884458 Elevation: 1510.9±2.04 m Accuracy: 286.1 m Time: 25-08-2025 16:48 Note: Discuss/review</p> <p>Powered by NoteCam</p>


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Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
					gather input and address concerns regarding the design, particularly in relation to access and land. ▪ Treatment of land slide in land slide affected stretches.	
5		16/09/2025	▪ Street Vendor	▪ Participants appreciated the project and acknowledged its positive impact on the community. ▪	▪ Construct smoother roads to enhance accessibility and improve transportation.	
	Youth					
6		25./09./25	(8 No.)	<ul style="list-style-type: none"> Limited local employment opportunities, inadequate platforms for skill development, and the absence of structured career guidance compel many individuals to migrate in search of better prospects; however, this migration, while serving as a coping mechanism, often exposes them to various social and economic challenges and risks. 	<ul style="list-style-type: none"> Integrate capacity-building and skill development components Encourage microenterprise development by promoting small-scale livelihood opportunities 	

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Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
7		03.10.2025	Youth (20 nos.)	<ul style="list-style-type: none"> Promote skill-building, entrepreneurship, Better road connectivity for transportation of goods and services 	<ul style="list-style-type: none"> Establish feedback and monitoring mechanisms through the Stakeholder Engagement Plan (SEP) Integrate capacity-building and skill development components 	
8		09.10.25	Youth (20 nos.)	<ul style="list-style-type: none"> The youth were also taught about access to proper sanitation and other facilities if employed by the contractor during execution of the project. community members expressed their willingness to provide land for the construction of boundary walls, Community hall cum bus shelter and separate public toilets for males and females. 	If any issues were to be faced by them in the near future then their problems and inconvenience can be brought forward to the GRM.	

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Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
				<p>community members expressed their willingness to provide land for the construction of boundary walls,</p> <ul style="list-style-type: none"> • Community hall cum bus shelter and separate public toilets for males and females. They will formally • submit written consent for the construction of these proposed structures. 		
	Women FGD					
9		19.09.2025	Women (13)	<ul style="list-style-type: none"> • Women are eager to contribute economically but are constrained by limited opportunities, social barriers, and lack of structured support • There is a pressing need for inclusive, women-centric interventions that promote local entrepreneurship, skills, and connectivity 	<ul style="list-style-type: none"> • Integrate women-focused skill development initiatives • Strengthen participation of women's Self-Help Groups (SHGs) in project-related awareness, monitoring, and plantation maintenance programs. 	 <p>9 Oct 2025 1:48:53 pm 25°22'3.08712"N 90°0'32.74546"E ±3.79m 84°E Altitude: 55.8mshg Speed: 0.0km/h</p>

7.1.2 FPIC PROCESS

As per the requirements of the World Bank's Environmental and Social Standard 7 (ESS7), the Free, Prior, and Informed Consent (FPIC) process is required for the following circumstances:

(i) have adverse impacts on lands and natural resources traditionally owned or used by Indigenous Peoples, including situations where such ownership is not legally recognized; (ii) result in the relocation or physical displacement of Indigenous households or communities from their customary or ancestral lands; or (iii) have significant impacts on Indigenous Peoples' cultural heritage, including their cultural, spiritual, or sacred sites and practices that hold collective significance for their identity and well-being.

In the case of the proposed road project, the FPIC process was triggered under the first condition, as the project activities involve the use of land and natural resources traditionally owned and utilized by Indigenous communities. The process was therefore undertaken to ensure that affected communities were fully informed, consulted in a culturally appropriate manner, and provided their collective consent prior to implementation.

The FPIC process was carried out in a phased and participatory manner, beginning with preliminary stakeholder mapping and engagement with the local Nokmas (Village Head).

The scope of the Borrower's Free, Prior, and Informed Consent (FPIC) process encompassed comprehensive engagement with Indigenous Peoples (IPs) and traditional institutions to ensure culturally appropriate participation throughout project preparation. The FPIC process included discussions on key aspects of the project, such as the proposed road design, alignment options, construction methodology, and implementation arrangements, as well as the anticipated environmental and social impacts and proposed mitigation measures. Consultations were conducted with representatives of the Nokma (village Head), village elders traditional leaders (Nokmas) women's groups, youth representatives, and other community members residing within the project's area of influence.

The discussions also focused on the potential risks associated with the project such as impacts on land, Community land with vegetation, water sources, and access to livelihoods, and cultural resources and on measures proposed to avoid, minimize, or mitigate these impacts. Community members were informed about the project's benefits, including improved road connectivity, economic opportunities, and enhanced access to essential services. The FPIC process thus ensured that Indigenous communities were not only consulted but also actively involved in shaping project decisions, implementation arrangements, and benefit-sharing mechanisms, reflecting their collective consent and ownership over the development process.

The FPIC process was conducted in a transparent and participatory manner, ensuring that community participation was entirely voluntary and free from any form of external manipulation, interference, or coercion. All consultations were facilitated by the ESIA team in collaboration with the Public Works Department (PWD) and information disclosed well in advance in the local Garo language. Meetings were held in accessible community spaces and scheduled in consultation with local leaders to maximize participation. Written consent from community representatives and participants was obtained through attendance sheets and minutes of meetings (MoM), which were duly reviewed and counter-signed by the Nokma (village headmen), council members, and representatives of the participating villages. Photographic and video documentation further corroborates that participants were engaged freely, and expressed their views without any undue pressure or influence. The signed records and documentation of the FPIC proceedings are enclosed in Annexure 7.3 of this report.

Information related to the proposed road project was disseminated in a culturally appropriate and accessible manner to ensure full understanding and participation of Indigenous communities. Project details including road alignment maps, typical cross-sections, and environmental and social management measures were presented using simple visual aids such as diagrams, maps, and posters. These materials were translated into the local Garo language and explained verbally during meetings to accommodate all literacy levels. The consultation sessions were facilitated by local interpreters and community mobilizers familiar with local customs and communication practices, ensuring clarity and mutual understanding. Frequently Asked Questions (FAQs) like project objectives, timelines, expected benefits, and potential risks were addressed during each session. Meetings were conducted in familiar community spaces, allowing both men and women, including elders and youth, to freely participate and express their views. This culturally sensitive approach ensured that the FPIC process was inclusive, transparent, and fully aligned with the traditional decision-making systems of the Garo community.

Process of good faith negotiation (sufficient time for IP Communities' decision-making, willingness to compromise) and agreements reached those documents the process of GFN

The FPIC process was conducted through good faith negotiations between project authorities and Indigenous Peoples' communities, allowing adequate time for traditional institutions and affected households to review project information, discuss internally, and make collective decisions. The project team incorporates community feedback such as alignment adjustments at Elephant crossings reflecting genuine efforts at consensus-building. All meetings were held transparently and respectfully, enabling free expression of views, particularly from women and elders, without coercion or interference. Agreements reached were documented through signed minutes and countersigned by the Nokma and Village council representatives, serving as evidence that the FPIC process was participatory, voluntary, and conducted in good faith.

Free, Prior, and Informed Consent (FPIC) Process adopted for the project road.

The ESIA consultant, comprising of four experts (Social, community, Tribal and Gender) and two community mobilizers, initiated the Free, Prior, and Informed Consent (FPIC) process by identifying affected communities within the project's area of influence, in accordance with the requirements of World Bank ESS7.

One-on-one interactions were conducted with Village council members, the secretary, and other key representatives between 25th and 30th August 2025 to discuss the project and assess the communities' willingness to participate in the process.

Official Invitations to Stakeholders – The Village Council agreed to call a meeting with village heads, traditional leaders, elders, women's groups, affected persons, and youth representatives to facilitate the consultation process. A mutually agreed-upon schedule was developed to ensure that community members had ample time to participate in discussions. The schedule outlined the sequence and timing of pre-consultation meetings, FPIC rounds, and focus group discussions covering initial one-on-one meetings (25–30 August 2025), the first FPIC consultations (25 September 2025), the second FPIC consultation (03 October 2025) and Third round FPIC consultation (09 October 2025). This schedule, agreed upon collectively by community representatives and project officials, provided sufficient time for advance notice, internal deliberations within each village, and informed participation during meetings. Letters are attached as Annexure 7.3

FPIC consultations undertaken for the project stretch are explained below:

- The first round of consultations was conducted by the ESIA team on 25.09.2025 at Chopapara Community Hall at 1.30 PM with a total of 38 participants. The participants included project-

affected persons (PAPs), village headmen, government officials, civil society organizations, and representatives from the Village Council. The key concerns raised miserable condition of road and of increase in road width in case of improvement of road to intermediate lane. As part of this process, participants were also sensitized about the project and introduced to the principles of Free, Prior, and Informed Consent (FPIC), thereby marking the initiation of the FPIC process.

- The second FPIC meeting for the AP Road was by the ESIA team on 03.10.2025 at Chopapara Community Hall at 1.30 PM with a total of 35 participants. This meeting provided an important platform for stakeholders to deliberate on project details, address community concerns, and ensure transparent and inclusive communication. The proceedings were presided over by the Executive Engineer (EE), Ampati Sub-Division with active participation from the Assistant Executive Engineer (AEE), Ampati Sub-Division, and representatives of key consultancy firms including Enviro Infra Solutions (ESIA Consultants), Rodic Engineering Services Pvt. Ltd. (DPR Consultants), and Satra Consultancy (ESMF Consultants). Local stakeholders, including village headmen, women, and youth representatives, also took part, ensuring broad-based and inclusive participation. In total, 35 participants engaged actively in the discussions, reflecting the community's genuine interest in the proposed infrastructure development.
- The meeting was organized in a structured manner to cover all key aspects. It commenced with the chairperson reading out the minutes of the first FPIC meeting to maintain continuity and transparency. This was followed by a detailed presentation of the Detailed Project Report (DPR), a comprehensive session on the Environmental and Social Impact Assessment (ESIA), and an informative discussion on the Grievance Redress Mechanism (GRM). To encourage active and inclusive participation, two parallel group discussions were held: one dedicated to women participants to capture their specific perspectives, and another with the youth group to gather their insights and suggestions. This structured approach ensured that diverse viewpoints were acknowledged and documented, thereby strengthening the participatory nature of the FPIC process.
- The third round of FPIC consultations for the Ampati Purakhasia Road under the Meghalaya Logistics and Connectivity Improvement Project was convened at Chopapara Community Hall on 09-10-2025. The consultation was conducted to reconfirm and document the communities' consent to the proposed project interventions following the disclosure of the detailed design, mitigation measures, and findings from the Environmental and Social Impact Assessment (ESIA). It also served to validate the outcomes of the previous FPIC meetings.
- During the session, the need for portions of community or private land for project interventions was discussed, and the community was informed that written consent from landowners or Nokmas would be required. Potential locations for amenities and labour camps were deliberated, and the PWD committed to conducting joint site inspections with community members. The community expressed willingness to provide land for the construction of boundary walls, a community hall cum bus shelter, and separate public toilets, and agreed to submit formal written consent for these structures.
- The proceedings were presided over by the Executive Engineer (EE), NEC Tura division, with active participation from the representatives of key consultancy firms including Enviro Infra Solutions (ESIA Consultants), Rodic Engineering Services Pvt. Ltd. (DPR Consultants), and Satra Consultancy (ESMF Consultants). Local stakeholders, including village headmen, women, and

youth representatives, also took part, ensuring broad-based and inclusive participation. In total, 50 local stakeholders participants engaged actively in the discussions, reflecting the community's genuine interest in the proposed infrastructure development. The signed mom of the FPIC proceedings are enclosed in Annexure 7.3 of this report.

Sufficient time and Information to enable Informed Consent – Consultations were conducted in Garo, the local language, to ensure informed participation. A prior notice was issued to inform communities about the meeting schedules. During the FPIC meeting, the project team provided detailed information on project impacts, benefits, mitigation measures, and grievance mechanisms. The indigenous communities were given adequate time to discuss, ask questions, and deliberate before providing or withholding consent for the project.

Consultations were conducted in Garo, the local language, to ensure informed participation. A one week prior notice was issued to inform communities about the meeting schedules. During the FPIC meeting, the project team provided detailed information on project impacts, benefits, mitigation measures, and grievance mechanisms thorough presentation. The indigenous communities were given adequate time to discuss, ask questions, and deliberate before providing or withholding consent for the project. The details regarding the agreements which were reached with the communities as conditions of FPIC are summarized as a part of FPIC mom and attached as Annexure 7.3.

Documentation of FPIC Proceedings – The discussions, concerns, inputs, and decisions made during the FPIC meeting were recorded, analyzed, and formally documented. All the meetings were documented through minutes, photographs and videography which were taken to maintain a transparent record and to ensure that PAPs were not coerced into agreement but participated freely and voluntarily. Attendance was collected at each consultation to confirm the presence of key stakeholders and community members. The Minutes of meeting (MoM) including photographs and attendance sheet of the participants of FPIC 1 and 2 conducted is presented in **Annexure 7.3**. Photographs for the same are presented in **Figure 7.1** and **7.2**.

Summary of the FPIC 1 Meeting

The A.E.E., PWD (R), Ampati Sub-Division, opened the meeting by welcoming the Nokma, Sordars, and all community members, emphasizing the importance of the Free, Prior, and Informed Consent (FPIC) process to ensure that the project's planning and implementation are transparent and inclusive of all stakeholders.

The proceedings were then handed over to the Executive Engineer, PWD (R), Ampati Division, who provided a detailed overview of the proposed Ampati–Purakhasia Road project. He highlighted the project's objectives, scope, key activities, and expected benefits for the region, while also addressing potential impacts such as land requirement, tree felling, utility relocation, and construction-related disturbances like noise, dust, and temporary inconvenience to residents. The presentation stressed the active involvement of local communities, promoting collaboration, transparency, and respect for indigenous rights and cultural heritage.

The Executive Engineer also outlined the Standard Operating Procedures (SOPs) for implementing FPIC through a three-tier consultation framework:

- **First Meeting:** Introduction of FPIC with community leaders and stakeholders.
- **Second Meeting:** Village-level FPIC sessions with village heads, MAC members, NGOs, women's groups, and elders to discuss project design, evaluate potential impacts, and gather feedback for the Resettlement Action Plan (RAP) and Indigenous Peoples Development Plan (IPDP).
- **Third Meeting:** Sharing consultation outcomes with the council for an official announcement, following the completion of the ESIA, ESMP, RAP, and IPDP.

The Environmental and Social Management Framework (ESMF) and Environmental and Social Impact Assessment (ESIA) were introduced, highlighting the involvement of subject matter experts to support collaboration between the community and government agencies. During discussions, the Nokma of Chopapara expressed strong support for the project, confirmed the community's willingness to provide land, and stated that there were no objections to its implementation.

Finally, the Executive Engineer explained the Grievance Redressal Mechanism, designed to facilitate collaborative monitoring of project-related concerns with community participation. The "Chopapara/Mebitpara Grievances Redressal Mechanism Committee" was formally established, as detailed in Annexure-A.



Figure 7.1: Photograph of 1st FPIC meeting held on 25.09.2025 at Chopapara Community Hall at 1.30 PM

Meeting Summary – 2nd FPIC Meeting

The meeting commenced with the A.E.E., PWD (R), Ampati Sub-Division, extending greetings to the Nokma, Sordars, and all community members, and welcoming representatives from RODIC Consultant. She introduced the purpose of conducting the second Free, Prior, and Informed Consent (FPIC) process, emphasizing its role in ensuring that project planning and implementation are transparent and inclusive of all stakeholders.

The Executive Engineer, PWD (R), Ampati Division, then provided detailed information about the project, including the funding agency, anticipated road width, and the proposed timeline for design and construction. Representatives from RODIC Consultant explained that the meeting aimed to gather community suggestions and presented the survey drawings for the current 8 km Ampati–Purakhasia Road, showing existing and proposed road widths, protection works, and other related details.

Community members provided feedback on retaining walls, boundary walls, and other structures, which the consultants confirmed would be incorporated into the design and presented during the FPIC 3 meeting. It was also highlighted that suggestions and complaints can be submitted through the Grievance Redressal Mechanism (GRM) during project implementation.

The meeting concluded with statements from the village secretary and the GRM committee, acknowledging the participation of PWD officials, RODIC Consultant, and all attendees.





Figure 7.2: Photograph of II FPIC meeting held on 03.10.2025 at Chopapara Community Hall at 1.30 PM

Summary of Proceedings – Third Round FPIC Meeting

The third FPIC meeting for the proposed Ampati to Purakhasia Road was chaired by the Assistant Executive Engineer, PWD (Roads), Ampati Sub- Division, with participation from PWD officials, ESIA experts, DPR consultants (M/s Roddic Consultants Pvt. Ltd.), Nokmas, village headmen, and community members. The minutes of the previous FPIC meeting were reviewed to maintain continuity.

The meeting began with the A.E.E., PWD (R), Ampati Sub-Division welcoming community leaders and explaining the purpose of the third FPIC consultation for the proposed road project. The Executive Engineer reviewed outcomes from the previous meeting, highlighted the importance of community participation, and noted that suggestions are being incorporated into the project design. He informed that some private or community land may be required, for which written consent from landowners or Nokmas will be obtained. Discussions were held on suitable locations for facilities and labour camps, with officials agreeing to conduct joint site inspections with the community and share inputs with the consultants. The A.E.E. further stated that additional suggestions or grievances may be submitted through the GRM during implementation. Community members expressed willingness to provide land for boundary walls, a community hall with a bus shelter, and separate public toilets, for which written consent will be formally submitted. The meeting concluded with remarks from the village secretary and GRM committee, thanking the PWD officials, consultants, and all participants.

Conclusion:

The meeting ended with positive feedback and confirmation of continued community cooperation for the project's implementation.



Figure 7.3: Photograph of IIIrd round of FPIC meeting held on 09th October 2025 at Chopapara Community Hall.

8. ENVIRONMENTAL AND SOCIAL MONITORING AND REPORTING PROGRAMME

8.1 General

Monitoring and reporting are critical components in the implementation of the project. Monitoring involves periodic checks to determine whether activities are being carried out in accordance with the proposed mitigation plans. It provides essential feedback to project management, helping ensure that project objectives are achieved on schedule. The reporting system ensures that environmental and social mitigation measures are implemented as planned. Together, monitoring and reporting support the proper implementation of the Environmental and Social Management Plan (ESMP).

The broad objectives of monitoring and reporting on E&S management are:

- To evaluate the performance of mitigation measures proposed in the ESMP and in other mitigation plans.
- To evaluate the adequacy of environmental and social assessment.
- To suggest improvements in ESMP and other mitigation plans based on the monitoring and to devise fresh monitoring based on the improved ESMP.
- To enhance environmental quality and social development through proper implementation of suggested mitigation measures.
- To meet the requirements of the existing environmental and social regulatory framework and community obligations.

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8.2 Environment and Social Management Plan

The Environmental and Social Management Plan (ESMP) has been prepared in accordance with the World Bank's Environmental and Social Framework (ESF) to ensure that the potential environmental and social impacts identified during the assessment are effectively managed during the design, construction, and operation phases of the project. The ESMP outlines specific mitigation, enhancement, and monitoring measures; defines institutional responsibilities; and provides a framework for capacity building and reporting. It serves as a practical tool to guide the implementation of mitigation measures, ensuring compliance with applicable national regulations and the World Bank's Environmental and Social Standards (ESSs), while promoting sustainable and inclusive project outcomes.

Table 8.1: Environment and Social Management Plan

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
	PRE-CONSTRUCTION					
1	Consents/ Permits/ Approvals/ Compliances	Non-compliance to various Environmental/ social/ regulatory requirements pertaining to the proposed project could lead to legal Implications	<ul style="list-style-type: none"> ➤ Obtain all necessary statutory clearances (CTE, CTO, Labour License, Fire NOC, Tree Cutting Permission, etc.) ➤ Renew permits before expiry. 	Contractor/ MPWD	CTE, CTO, Labour License, Fire NOC, Tree Cutting Permission to be submitted and tracked	MPWD/PMC/CSC
2	Land Procurement	Loss of Land/ Livelihoods	<ul style="list-style-type: none"> ➤ RPF and RAP shall be followed. 	MPWD division, contractor and concerned authorities	Compensation records maintained; Grievances resolved	MPWD/CSC/NGO
3	Contractor's ESMP (CESMP) Preparation and Implementation	Inadequate preparation and implementation of CESMP by Contractor can leave environmental and social issues unattended	<ul style="list-style-type: none"> ➤ The contractor needs to follow the project ESMP to formulate the CESMP and get it approved by MPWD. 	Contractor	Approved CESMP including TMP, LMP and other relevant plans, and implemented;	MPWD/PMC/CSC
4	Identification of land for material storage yard/ construction camp/ labour camp	Discharges from Yards/ Camps to pollute the surroundings and lead to social tension.	<ul style="list-style-type: none"> ➤ Contractor needs to identify suitable land for storage yard/ construction camp/ labour camp ➤ The land shall not be closer to the water bodies, waterlogged areas or wetlands. 	Contractor	Approved site location; Lease/NOC copies;	MPWD/PMC/CSC

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Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			<ul style="list-style-type: none"> ➤ The land will be handed back to the owner in the same condition as it was prior to the commencement of project activities, once the project is completed. ➤ Contractor to produce the lease agreements, NOC etc. for these lands. 			
5	Supply of Construction Material	Sourcing materials from unauthorized sources.	<ul style="list-style-type: none"> ➤ Procurement of construction material only from approved quarries and sites and licensed/ authorized vendors/ manufacturers. Contractor to produce approvals and receipts. 	Contractor	EC, Permits, challans, Material source approval copies;	MPWD/CSC
6	Water	Pollution of surface and groundwater sources.	<ul style="list-style-type: none"> ➤ The Contractor will be responsible for arranging adequate supply of water for the entire construction period. ➤ The contractor will minimize the pollution and wastage of water during construction 	Contractor	Permission for Water source; Usage records; Wastewater management measures	MPWD/PMC/CSC
7	Appointment of Environment, Social and Safety Officers	Inefficient and incompetent supervision by contractors may lead to negative impacts on environment, Social, health and safety.	<ul style="list-style-type: none"> ➤ The Contractor would prepare OHS plan and other required plans; as a part of CESMP, as per the WB guidelines. ➤ The contractor will appoint qualified and experienced Environment. Social and Safety personnel to ensure implementation of CESMP and occupational health and safety issues at the camps and construction work sites. 	Contractor	To be mobilized before construction; approved OHS plan	MPWD/PMC/CSC
8	Identification of OHS Hazard and Risk Categorization	May cause physical harm, injury, illness, or death to workers.	<ul style="list-style-type: none"> ➤ Conducting workplace inspections to identify hazards and document. ➤ Consulting with workers to identify hazards that may not be obvious to employers or safety professionals. ➤ Reviewing safety data sheets (SDSs) to collect information about the 	Contractor	OHS hazard register; Inspection reports;	MPWD/CSC

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Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			hazards of chemicals and other substances used in the workplace. ➤ Consulting with industry standards and regulations to identify specific hazards that must be addressed in the workplace.			
9	Other Construction Vehicles, Equipment and Machinery	Vehicles and equipment not complying with regulations may lead to pollution of environment.	➤ The contractor will maintain records of fitness and Pollution Under Control (PUC) certificates for all vehicles and generators used during the contract period	Contractor	Records of valid PUC / fitness; Inspection log	MPWD/PMC/CSC
10	Tree Cutting	Loss of green cover and biodiversity	➤ Maximum efforts shall be made to minimize the number of trees to be felled. ➤ Tree cutting and disposal shall be done as per the Forest Dept.	Contractor	Records of trees cut and saved.	MPWD/CSC
11	Joint field verification	The impacts may not have been identified in time.	➤ The MPWD and the Contractor shall carry out joint field verification to ascertain the local complaints/suggestions and to confirm the need for additional protection measures or changes in design/scale/nature of protection measures including the efficacy of enhancement measures suggested in the ESMP. The MPWD shall maintain proper documentation and justifications/reasons in all such cases.	Contractor	Verification reports;	MPWD
12	Damage to existing eco-system due to borrowing activities	Indiscriminate borrowing activities may damage the eco-system and lead to unproductive environment	➤ The Contractor will have to obtain the Environmental Clearance for borrow areas. ➤ The borrow area will be operated as per the MoEFCC guidelines issued by the concerned SEAC and SEIAA.	Contractor	Borrow area EC copy; Approved management and closure plan	MPWD /CSC
13	Identification of construction material	Inconveniences and safety issues to the public due to	➤ The material transport route through existing network of roads should be	Contractor	Approved route plan; Community	MPWD/CSC

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Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
	transportation route	the material transport vehicles.	planned and approved by the local transport authorities. ➤ The local communities need to be consulted with prior information on any likely inconveniences.		consultation record	
14	Identification of sites for debris disposal or wastes generated from construction camps and site offices	Pollution due to indiscriminate dumping of wastes. Wastes entering water bodies and groundwater causing pollution	➤ MPWD Division and the Contractor are responsible for identifying a suitable area in consultation with local administration to dispose of the wastes from labour camps, construction sites and site offices.	Contractor	Approved disposal site and its management plan; NOC, Agreement with landowner; Waste disposal records;	MPWD/CSC
15	Relocation of Utility and Common Property Resources (CPR)	Loss of services from utilities and common property resources for the public	➤ When the utilities/ Common Property Resources need to be shifted, they will be shifted in consultation with the communities and with least inconvenience to the public. ➤ If any displacement of Utility/CPRs is required, they will be relocated with prior approval of the concerned agencies. The relocation site identification will be in accordance with the choice of the community.	Contractor/ MPWD Division	Records of Relocation completion.	MPWD/ PMC/CSC
CONSTRUCTION						
1	Crushers, Hot mix Plants & Batching Plants	Impacts due to establishment and operation of plants and equipment	➤ Crushers, hot-mix and batching plants shall be located at least 1000m (1km) away from residential/ settlements, forests, wildlife movement areas, and commercial establishments, preferably in the downwind direction. ➤ The Contractor shall submit a detailed layout plan for all such sites and seek prior approval before entering into a formal agreement with a landowner for setting-up such sites. ➤ Specifications of crushers, hot mix	Contractor	Approved layout plan; Valid NOCs/Consents; Dust suppression records; Air quality monitoring reports	MPWD/PMC/CSC

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Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			<p>plants, and batching plants shall comply with the technical requirements of the contract and prior Consent / NOC for all such plants shall be obtained.</p> <p>➤ No such installation by the Contractor shall be allowed till all the required legal clearances are obtained from the competent authority.</p>			
2	Borrow Areas	Impacts due to improper operation and closing of borrow areas	<p>➤ Borrow area should be located at a minimum distance of 300m from the residential/ settlement area. Proper barricading should be provided and access to the borrow areas should be restricted to the unauthorized persons.</p> <p>➤ The Contractor should submit the EC, a copy of agreement with the landowner, borrow area management and closure plan before initiating any kind of borrowing activities.</p>	Contractor	EC and lease copies; Approved Borrow area restoration and Closure plan	MPWD/PMC/CSC
3	Quarries	Impacts due to improper management, operation and closing of quarries	<p>➤ The Contractor shall identify materials from legally valid quarries with existing NOC from the relevant departments.</p> <p>➤ No quarry or associated plants can be set-up within 1000m from the residential/ settlement locations</p> <p>➤ Contractor shall prepare a haul road network for quarry transport and ensure the suitability of such haul roads from the safety of residents, biodiversity and other environment points of views.</p>	Contractor	Quarry permit, EC; Safety inspection report; Haul road maintenance record, dust suppression measure, geotagged photos	MPWD/PMC/CSC
4	Dismantling of Bridges/ Culverts/ Structures	Impacts due to improper dismantling and disposal	<p>➤ All necessary precautions shall be taken while working near cross-drainage channels, to prevent earthwork, stonework, construction</p>	Contractor	Debris disposal/reuse records; Approved Site restoration	MPWD/PMC/CSC

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Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			<p>materials from obstructing cross-drainage at rivers, streams, and drainage systems, or from causing flooding.</p> <ul style="list-style-type: none"> ➤ Reusable materials (e.g., steel, stones, bricks) shall be segregated and stored properly for reuse or recycling. ➤ Non-recyclable debris and waste materials shall be transported to approved disposal sites identified and approved by the concerned authority. ➤ Disposal sites shall be located away from water bodies, agricultural lands, and other environmentally sensitive areas. ➤ Temporary barriers or silt fences shall be provided to prevent debris from entering watercourses. ➤ Upon completion, the associated disposal sites shall be restored to their original condition or as directed by the Engineer 		plan; Photographic documentation.	
5	Bituminous waste disposal	Impacts due to hazardous wastes	<ul style="list-style-type: none"> ➤ The contractor shall maintain records of quantities generated, transported, and disposed of, along with details of the disposal site and approvals obtained. ➤ Bituminous waste shall be collected and stored temporarily in impermeable, lined containers or areas to prevent leaching or contamination of soil and groundwater. ➤ The disposal of bituminous wastes shall be carried out by the Contractor at secure landfill sites approved by the concerned government authorities. 	Contractor	Records of Waste reused/disposed; Details of approved disposal site; Photographic documentation.	MPWD/PMC/CSC

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Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			<ul style="list-style-type: none"> ➤ No bituminous waste shall be disposed of in water bodies, open lands, agricultural fields, or along the roadside ➤ Periodic inspections shall be carried out to ensure compliance with waste management guidelines. ➤ Where feasible, recycling or reuse of scarified bituminous material in road base or other construction activities shall be promoted, subject to environmental and quality standards. 			
6	Contamination of Soil	Soil pollution due to Oil and fuel spills from construction equipment and plants.	<ul style="list-style-type: none"> ➤ Construction plants, workshops, and fuel storage areas shall be located at least 500 m away from any surface water body and environmentally sensitive locations. ➤ Oil interceptors shall be installed at construction camps, vehicle parking, and washing areas to trap oil and grease before wastewater is discharged. ➤ All fuel and lubricant storage tanks shall be placed on impermeable platforms or within bunded (contained) areas. ➤ Regular maintenance and inspection of construction equipment and vehicles shall be carried out to prevent leakage of oil, fuel, or hydraulic fluids. ➤ Spill control kits (absorbent pads, sand, and containment booms) shall be available at all fuel storage and handling locations. ➤ Used oil and lubricants shall be collected, stored in labelled, leak-proof 	Contractor	Spill log; Waste oil disposal records; Fuel storage inspection record. Photographic documentation.	MPWD/PMC/CSC

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Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			<p>containers, and handed over only to authorized aggregators/recyclers for disposal in compliance with applicable hazardous waste regulations.</p> <ul style="list-style-type: none"> ➤ Records of fuel usage, storage, and waste oil disposal shall be maintained and made available for inspection. ➤ Stormwater runoff from fuel and equipment storage areas shall be directed through oil-water separators before discharge. 			
7	Air Pollution - Dust Generation	Dust generation will cause air pollution and will have impacts on health and safety.	<ul style="list-style-type: none"> ➤ Vehicles delivering materials should be covered to reduce spills and dust blowing off the load. ➤ Water should be sprinkled regularly on the work sites. ➤ Road slopes to be covered immediately after completion. ➤ Speed limits shall be enforced for construction vehicles within and near project sites to reduce dust generation. ➤ Personal protective equipment (PPE) such as masks shall be provided to all workers exposed to dusty environments. ➤ Air quality monitoring shall be conducted periodically to ensure compliance with prescribed air quality standards. ➤ Community complaints related to dust shall be recorded, and addressed promptly. 	Contractor	Air quality monitoring reports; Dust suppression log; PPE compliance records	MPWD/PMC/CSC
8	Emissions	The emissions from vehicles and construction equipment will pollute the	<ul style="list-style-type: none"> ➤ Fitness and PUC of the vehicles and equipment's need to be ensured. ➤ LPG shall be used as fuel for cooking of 	Contractor	Valid PUC certificates; Equipment	MPWD/PMC/CSC

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Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
		air causing health and safety issues as well.	food at construction labour camp instead of fuel wood. ➤ Dust extraction, collection and control systems shall be installed at batching plants, crushers, and material handling areas to minimize particulate emissions.		maintenance log; Emission test results	
9	Contamination of Surface / Ground Water	Discharges from construction activities and construction camps/labour will lead to surface/groundwater pollution.	➤ All the debris resulting from construction activities and labour camp shall be removed from the site and disposed at approved sites away from water bodies, on a regular basis to prevent them from getting into surface runoff. ➤ Adequate sanitation and waste management facility to be provided in construction camp. ➤ Construction labours should be restricted from polluting the water sources or misusing the sources. ➤ Use least amount biodegradable bentonite slurry during piling work. ➤ Contain the Bentonite slurry properly, to not enter waterways or soil and dispose of the slurry appropriately after use.	Contractor	Water quality monitoring report; Waste disposal records; Camp inspection records. Photographic documentation.	MPWD/PMC/CSC
10	Water requirement for project	Over extraction or exploitation of ground/surface water will lead to water scarcity.	➤ Contractor to ensure optimum and judicious use of water; ➤ Discourage labour from wastage of water and applicable prior approvals shall be obtained from concerned authorities. ➤ Rainwater harvesting structures shall be installed at construction camps and plant sites to promote sustainable use	Contractor	Water consumption log; Permission for water source; Installation of Rainwater harvesting structure	MPWD/PMC/CSC

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Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			<p>of water.</p> <ul style="list-style-type: none"> ➤ Awareness programs shall be conducted for laborers and staff on responsible water use and conservation practices. ➤ Records of daily water consumption shall be maintained as part of regular reporting. 			
11	Coffer dam to make dry working space for bridge work	Change in the flow pattern and quality of water, effect on local habitat	<ul style="list-style-type: none"> ➤ Selecting the right location for the cofferdam to minimize its impact on the environment. ➤ Using environmentally friendly materials to construct the cofferdam eg. Biodegradable/ reusable materials can be used instead of concrete. ➤ Restoring the environment after construction. This may involve replanting vegetation and removing any debris. 	Contractor	Worksite inspection record; Restoration completion record	MPWD/PMC/CSC
12	Noise from vehicles, plants and equipment	Noise from construction vehicles, plant and equipment will lead to noise pollution and cause health and safety issues	<ul style="list-style-type: none"> ➤ Construction operations should be undertaken primarily during day time to minimize noise impacts. ➤ Fitness and PUC of the vehicles and equipment's need to be ensured. ➤ No noisy construction activities will be permitted around educational institutions/ health centers (silence zones) and up to 100 m from other sensitive receptors. ➤ Noise level monitoring shall be carried out as per the monitoring schedule. In case there is increase in noise level, preventive measures should be taken to reduce the noise level. ➤ Hearing Protection devices (earplugs or earmuffs) should be provided 	Contractor	Noise level test report; PPE usage record; Complaint register; vehicles, plants and equipment maintenance records.	MPWD/PMC/CSC

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Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
13	Blasting	Unmanaged blasting result in health and safety issues and accidents.	<ul style="list-style-type: none"> ➤ The Contractor will inform well in advance and obtain permission as is required from all Government Authorities, public bodies and private parties; ➤ Blasting will be carried out only with permission of Engineer-in-charge. All the statutory laws and regulations, rules etc., pertaining to acquisition, transport, storage, handling, and use of explosives will be strictly followed. ➤ Blasting management plan shall be developed and should be approved by the concerned authority. The same shall be strictly followed by the contractor. 	Contractor	Approved Blasting management Plan; Blasting permission; Incident log. Geotagged photos.	MPWD/PMC/CSC
14	Loss of trees and Plantation works	Cutting of trees can lead to loss of biodiversity.	<ul style="list-style-type: none"> ➤ Clearing and uprooting should be avoided beyond that which is directly required for construction activities. ➤ Kerosene / LPG should be preferably used to avoid felling of the trees or provide community kitchen for the labour camps for cooking. ➤ Camps and storage yards shall be located in the areas already devoid of vegetation or having little vegetation 	Contractor	Tree felling register; Plantation record;	MPWD/PMC/CSC
15	Terrestrial Flora and Fauna	Construction activities and workers may cause harm to flora and fauna.	<ul style="list-style-type: none"> ➤ All the workers will need to be oriented and monitored by the contractor so as not to cause any harm to the flora and fauna. ➤ Hunting and fuel wood collection will be strictly prohibited ➤ Speed coming measures, safety signages and Installation of AI-based camera systems (as per RDSO 	Contractor	Worker awareness attendance ; Wildlife sighting log	MPWD/PMC/CSC

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Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			specifications, RDSO/SPN/TC/65/2021).			
16	Aquatic Fauna	Construction activities and workers may cause harm to fauna.	<ul style="list-style-type: none"> ➤ Any works affecting aquatic habitat will be done during low flow (when water depth is less than 5 m) and when banks would be dry. ➤ Where any GI wire mesh gabions are used; all GI wire ends need to be folded inside. ➤ Ensure that no construction activities will be carried out during monsoon and the fish breeding season. 	Contractor	Work timing records; Site inspection checklist	MPWD/PMC/CSC
17	Occupational Health and Safety	When Occupational Health and Safety are compromised the associated risks from accidents and incidents could affect health and safety of the workers and others on construction/ project sites. Improper first aid facilities on the sites could affect health and safety of workers and others.	<ul style="list-style-type: none"> ➤ The Contractor would prepare OHS plan and other required plans as per the WBs guidelines. ➤ All the laborers to be engaged for construction works shall be screened for health and adequately treated before issue of work permits. ➤ Periodic health check-up of construction workers. ➤ Prevention of mosquito breeding need to be ensured at the project site and other ancillary areas ➤ The contractor's Environment and Safety personnels, shall ensure implementation of CESMP including Occupational health and safety issues at the camp, construction work sites ➤ Avoiding collection of stagnant water. Adequate drainage, sanitation and waste disposal will be provided at workplaces. ➤ All workers and staff should be provided with Personal Protective Equipment (PPE) appropriate to their 	Contractor	Approved OHS plan; OHS training log; PPE checklist; Awareness programme and Health inspection reports	MPWD/PMC/CSC

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Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			<p>job on-site and their use shall be ensured.</p> <ul style="list-style-type: none"> ➤ All construction sites should be barricaded properly. ➤ Smoking should be prohibited near areas of fire or explosion risk. ➤ Sufficient supply of potable water should be ensured for all workers and employees on-site. ➤ Ensure a FA room at the camp and first aid kits are available in all work areas. ➤ Safe working techniques will be followed up and all the workers will be trained. ➤ An Emergency Response system in case of any incidence will be developed and implemented. ➤ The Contractor will conduct awareness programmes on EHS, HIV/AIDS and other sexually transmitted diseases for workers at least once in a quarter and the record of such training programme must be recorded. ➤ Conduct regular safety audits on safety measures adopted during construction. 			
18	Community Health and Safety	The safety aspects like (i) safety of road users including pedestrians and cyclists (ii) safety of cattle; (iii) safety of local community (iv) unsafe/ hazardous traffic conditions due to construction vehicle movement need to be	<ul style="list-style-type: none"> ➤ Plants and equipment will be installed sufficiently away from the settlements. ➤ Proper caution signage, barricading, delineators, lightings etc. will be installed at construction zone and temporary diversions. ➤ Hard barricading will be provided at construction zone near habitation area and public roads, and the same will be maintained throughout the 	Contractor	Safety signage installed; Community complaint register; Traffic control records	MPWD/PMC/CSC

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Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
		considered during the construction stage. Children are most vulnerable to injury due to vehicular accidents.	<ul style="list-style-type: none"> ➤ construction period. ➤ Proper traffic management will be ensured near roads of the Construction zone. ➤ Road safety education will be imparted to drivers running construction vehicles. In case of negligent driving, suitable action will be taken. ➤ Speed restrictions shall be imposed on project vehicles to control speeding. ➤ Installation of temporary speed bumps to control speed near designated pedestrian crossing areas/school areas/ market places/ religious places/ human habitations. ➤ The general public/ residents shall not be allowed to any of the risk areas of the project, e.g., excavation sites, construction sites and areas where heavy equipment is in operation. ➤ In the consideration of risk at civil works, each labour should be covered under ECA 1923 insurance until completion of work. 			
19	Emergency Response system	Absence may result to increased incidents, injury, economic loss etc.	<ul style="list-style-type: none"> ➤ Develop and implement ERS ➤ Train personnel and Establish communication channels ➤ Systematic planning and training for emergencies. 	Contractor	Approved ERP; Emergency drill and training report; Incident response record	MPWD/PMC/CSC
20	Health Management – Communicable Diseases	The water fringe areas provides suitable habitats for the growth of vectors of various diseases, which is likely to increase the	<ul style="list-style-type: none"> ➤ There would be possibility of the transmission of communicable diseases due to migration of labour population from other areas at the construction site. 	Contractor	Health screening record; Awareness session log; Medical report; Agreement with nearby hospital	MPWD/PMC/CSC

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Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
		incidence of water-borne diseases.	<ul style="list-style-type: none"> ➤ Agreement shall be made with nearby health centre or hospital for emergency treatment. ➤ Special Measures for COVID 19 should be strictly followed at the camp and construction site. 			
21	Risk of Natural Hazards	The project area is at risk from floods and Earthquakes.	<ul style="list-style-type: none"> ➤ Protection of Agriculture Land near roads/ bridges. ➤ The mitigation measures should be adopted as per norms of State Disaster Management Authority, Government of Meghalaya. 	Contractor	Site assessment report; Record of Compliance with SDMA norms	MPWD/PMC/CSC
22	Risk of Force Majeure Combine with previous	These unforeseen risks can have both adverse environmental and social impacts	<ul style="list-style-type: none"> ➤ All reasonable precaution will be taken to prevent danger of the workers and the public from fire, flood, drowning, etc. ➤ All necessary steps will be taken for prompt first aid treatment of all injuries likely to be sustained during the course of work. ➤ Contractor has to prepare a response plan before start of construction works 	Contractor	Force majeure preparedness plan; Emergency contact list	MPWD/PMC/CSC
23	Hygiene	Impacts related to unhygienic surroundings	<ul style="list-style-type: none"> ➤ At every workplace, good and sufficient water supply shall be maintained to avoid waterborne diseases to ensure the health and hygiene of workers. ➤ Adequate drainage, mobile toilets shall be provided at workplace. ➤ Preventive Medical care shall be provided to workers. ➤ Proper Hygiene shall be maintained 	Contractor	Sanitation inspection record; Hygiene logbook	MPWD/PMC/CSC
24	Traffic Management	Unplanned and unmanaged traffic diversion and detours can	<ul style="list-style-type: none"> ➤ Before start of the construction, proper traffic management plan will be prepared and submitted to MPWD 	Contractor	Approved TMP; Signage/barricade checklist; Traffic	MPWD/PMC/CSC

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Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
		result in public nuisance.	<p>for approval. Secure assistance from local police for traffic control during the construction.</p> <ul style="list-style-type: none"> ➤ Necessary signage and barricading will be provided for safety of road users. ➤ Contractor will ensure that no construction materials and debris are lying on the road. It will be collected and disposed of properly. ➤ Unnecessary parking and sound pollution to be strictly avoided near settlements and sensitive receptor such as schools, hospital and cultural centers. ➤ The contractor will ensure that the diversion/ detour is always maintained in running conditions, particularly during the monsoon to avoid disruption to traffic flow. 		incident register; geotagged photos	
25	GBV-SEAH Risks	GBV-SEAH risks may arise due to labor influx	<ul style="list-style-type: none"> ➤ Ensure labor camps are away from settlement areas ➤ Ensure that every worker working in the project has been given an orientation on the Worker's Code of Conduct, especially on GBV and SEAH, and has signed the Code of Conduct. ➤ Conduct periodic awareness programs targeted at women laborers and women and children of communities residing close to the work sites for reporting incidents of GBV- SEAH ➤ Ensure complaints of GBV- SEAH are recorded and addressed with urgency. Ensure that name(s) of complainant(s) are kept in confidence and enable 	Contractor	Signed CoC register; GBV training log; GBV complaint record	MPWD/PMC/CSC

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Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			<p>anonymous reporting of complaints.</p> <p>➤ Activate GBV Grievance Redressal Committee immediately on receipt of any GBV- SEAH complaint. Take action on recommendation of the GBV Grievance Redressal Committee within 24 hours of submission of the report.</p>			
26	Chance Finds	There is a possibility of Cultural relics, Chance finds at the construction sites. Without proper plan these artefacts may be misused by contractor/ workers.	<p>➤ If any cultural remains of geologic or archaeological interest are found, CSC and MPWD shall be immediately informed of such discovery and carry out the instructions for dealing with the same.</p>	Contractor	Chance find report; Notification records	MPWD/PMC/CSC
27	Compliance to Labour Welfare Laws and reporting	Workplace accidents and injuries, unsafe working condition, loss of productivity etc.	<p>➤ Establish a policy and ensure the compliance within the organization, from the top to the lowest-level employee, understands the importance of complying with labour laws and reporting.</p> <p>➤ Employees should be trained on their rights and responsibilities under labour laws.</p> <p>➤ Employees should have a way to report violations of labour laws without fear of retaliation. This could be a hotline, an email address, or a suggestion box.</p> <p>➤ Investigating and taking action on violations. This could include disciplinary action against the violator, or even legal action.</p> <p>➤ Employees should be kept updated on the organization's compliance with labour laws. This could be done through regular training sessions,</p>	Contractor	Labour law compliance record; Training attendance record	MPWD/PMC/CSC

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Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			newsletters, or other communication channels.			
28	Labour Influx	Strain on infrastructure, such as housing, healthcare, and education; social tension, as new arrivals compete with locals for jobs and resources.	<ul style="list-style-type: none"> ➤ Proper plan for labour influx by investing in infrastructure and social services. ➤ Governments can regulate the flow of labour to ensure that it is orderly and sustainable. ➤ Local communities can engage with new arrivals to help them understand the local culture and customs. ➤ Maximum use of local labours 	Contractor	Labour License and registration records; Local labour hiring records.	MPWD/PMC/CSC
29	GRM	Increased impunity, conflict and violence; Loss of trust and confidence	<ul style="list-style-type: none"> ➤ Establish a grievance redressal mechanism ➤ Ensure that the mechanism is impartial and independent ➤ Provide adequate support to people who use the mechanism ➤ Communicate effectively with people about the mechanism 	Contractor	GRM register; Grievance resolution records	MPWD/PMC/CSC
30	Monitoring and Reporting (Monthly/ Quarterly)	Monitoring environmental attributes like (Air, Water, Noise & soil microbiology) and proper reporting are important for the successful ESMP implementation	<ul style="list-style-type: none"> ➤ The parameters to be monitored, frequency and duration of monitoring as well as the locations to be monitored will be as per Monitoring Plan prepared. ➤ Regular submission of CESMP implementation monitoring report 	Contractor	Monthly/quarterly ESMP compliance report; Monitoring data records	MPWD/PMC/CSC
	Operation Phase					
1	Debris and Waste from Clearing/ Closure of Construction Site, Labor Camps, Disposal Sites, and Borrow Areas	Land and soil contamination due to improper waste disposal; Aesthetic degradation; Health risks to nearby communities	<ul style="list-style-type: none"> ➤ Contractor shall prepare and implement a Site Restoration Plan approved by the Engineer. ➤ On completion of works, all temporary structures, debris, and wastes shall be cleared. ➤ Disposal pits and sanitation trenches shall be filled, compacted, and sealed. 	Contractor	Site clearance restoration records and closure NOC; Geotagged photos	MPWD

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Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			<ul style="list-style-type: none"> ➤ Topsoil removed during construction shall be re-spread to aid vegetation regrowth. ➤ Native grass or trees shall be planted to stabilize restored areas and improve aesthetics. 			
2	Soil Erosion due to Runoff over Steep Slopes and Embankments	Loss of fertile topsoil; Siltation of nearby water bodies; Slope instability or road damage	<ul style="list-style-type: none"> ➤ Regularly inspect slopes and embankments for erosion signs. ➤ Implement bioengineering measures like turfing, hydroseeding, and vegetation planting. ➤ Provide stone pitching, retaining walls, or gabions where needed. ➤ Maintain effective drainage systems to reduce concentrated runoff. 	Contractor	Reports on Erosion inspection; implementation of mitigation measures; Drain maintenance log	MPWD
3	Water Pollution from Road Runoff and Drainage into Water Bodies	Deterioration of surface and groundwater quality; Sediment and oil contamination in nearby streams or waterbodies	<ul style="list-style-type: none"> ➤ Conduct regular water quality monitoring during operation phase. ➤ If pollutants exceed prescribed limits, install silt traps, or sedimentation chambers. ➤ Ensure roadside drains are cleaned and desilted regularly. ➤ Conduct public awareness to discourage waste disposal into water bodies. 	Contractor	Water quality monitoring results; Drain cleaning records	MPWD
4	Dust Generation from Vehicular Movement	Deterioration of ambient air quality; Nuisance to roadside residents and vegetation; Reduced visibility	<ul style="list-style-type: none"> ➤ Establish and maintain roadside plantation to serve as dust barriers. ➤ Maintain smooth road surfaces to minimize dust generation. ➤ Install signage discouraging over-speeding, which increases dust levels. 	Contractor	Air quality results; Plantation survival record	MPWD
5	Air Pollution from Vehicular Emissions	Increased levels of NOx, SO ₂ , CO, and PM; Health impacts on local population; Deterioration of roadside vegetation	<ul style="list-style-type: none"> ➤ Conduct ambient air quality monitoring at sensitive locations. ➤ Maintain green buffers along the corridor. ➤ Organize awareness campaigns for 	Contractor	Air quality results; Plantation survival record ; Awareness records	MPWD

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Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			drivers on emission reduction and vehicle maintenance.			
6	Noise Pollution from Increased Traffic Movement	Noise nuisance to residents; Disturbance to schools, hospitals, and wildlife	<ul style="list-style-type: none"> ➤ Conduct periodic noise level monitoring. ➤ Provide dense plantation near sensitive receptors. ➤ Enforce "No Horn" zones near schools and hospitals. ➤ Maintain road surface to minimize noise due to uneven pavement. 	Contractor	Noise monitoring results; Maintenance records	MPWD
7	Road Safety and Accident Risks	Traffic congestion; Increased likelihood of road accidents; Risk to pedestrians and local communities	<ul style="list-style-type: none"> ➤ Install and maintain proper signage, reflectors, and road markings. ➤ Ensure adequate lighting at intersections and pedestrian zones. ➤ Provide speed control measures and pedestrian crossings in settlement areas. ➤ Conduct community road safety awareness programs. 	Contractor	Accident record; Safety audit report; Awareness records	MPWD
8	Maintenance Waste from Roadside Maintenance, Drain Cleaning, or Repairs	Soil and water contamination from indiscriminate disposal; Visual pollution and clogging of drains	<ul style="list-style-type: none"> ➤ Collect and dispose of maintenance waste at designated locations. ➤ Prohibit dumping into drainage channels or low-lying areas. ➤ Reuse or recycle suitable materials (e.g., asphalt, concrete, metal). 	Contractor	Waste logbook; Disposal records	MPWD

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8.3 Performance Indicators

Environmental and social components identified in affecting the environment and social conditions at critical locations have been suggested as performance indicators (PIs). For example, near the construction site, a thick layer of dust over the nearby vegetation/leaf is an indication that the dust control measures are not effective. The performance indicators shall be evaluated under three heads as;

- Environmental condition indicators to determine efficacy of environmental management measures in control of air, noise, water and soil pollution.
- Environmental and social management indicators to determine compliance with the suggested environmental and social management measures. Social monitoring indicators will be indicated as part of the Resettlement Action plan (RAP)/Indigenous People Development Plan (IPDP).
- Operational performance indicators have also been devised to determine efficacy and utility of the proposed mitigation measures.

The performance indicators and monitoring plans prepared for the road stretch are given in **Annexure 8.1**. Details of the performance indicative parameters for each of the component will have to be identified and reported during all stages of the implementation.

8.4 Monitoring Plan For Environmental Conditions

Environmental monitoring involves regular checking of the environmental management issues detailed in the ESMP and to ascertain whether the mitigation measures are achieving their objectives, according to the ESMP, with the progress of the works. It provides the necessary feedback for Project management to keep the programme on schedule.

For each environmental condition, the Monitoring Plan specifies the parameters to be monitored, the locations of monitoring sites, and the frequency and duration of monitoring. It also outlines the applicable standards, as well as the responsibilities for implementation and supervision. The Monitoring Plan, along with details of monitoring locations for environmental condition indicators during the construction and operation stages of the project, is presented in **Table 8.1**.

The monitoring will be carried out by Contractor through the NABL accredited agency and will be supervised by the Environment Specialists of the CSC/PMC and E&S cell MPWD.

8.5 Monitoring Plan for Social Conditions

The social monitoring plan is designed to track and evaluate the effectiveness of social safeguard measures implemented under the Environmental and Social Impact Assessment (ESIA). It ensures compliance with national and international social safeguard frameworks, including the Resettlement Action Plan (RAP) and the Indigenous Peoples Development Plan (IPDP). The monitoring plan for social condition indicators of the sub-project during the construction stage is presented in **Table 8.2**.

Table 8.2: Environmental Monitoring Plan for Environmental condition indicators (Air, Water, Noise and Soil)

Environmental Attribute	Timing	Parameter	Standards	Frequency	Duration	Location	Total no. of Samples during construction and operation stage.	Implementation
Air	Construction	CO, NOx, PM10, PM2.5 and SO2	CPCB Guidelines (NAAQMS/ Volume- I/2013-14)	1 locations for 3 Seasons* for 2 consecutive years	24 hours sampling	1 locations (Construction Plant Sites, settlements and Work Zones)	6	Contractor through NABL accredited Laboratory and supervised by Construction Supervision Consultant
	Operation			1 locations for 3 Seasons for 1 Year		At 1 locations during operation stage where monitoring had been done during construction stage	3	Contractor through NABL accredited Laboratory and supervised by Construction Supervision Consultant
Water	Construction	As per Drinking Water Standards	Indian standards for inland surface waters (IS:2296,1982) and for drinking water (IS:10500-2012)	(surface water at 1 locations for 3 Seasons for 2 consecutive years. ground water at 1 locations for 3 seasons for 2 consecutive years	As per Grab Sampling guidelines	Drinking water samples from the labour camps and from hand pumps. Surface water from the water courses near the work site and River.	4	Contractor through NABL accredited Laboratory and supervised by Construction Supervision Consultant
	Operation			Surface water 1 locations for 3 Seasons for 1 years. Water (Ground water) at 1 locations for 3 Seasons for 1 years.		At 2 locations during operation stage where monitoring had been done during construction stage	4	Contractor through NABL accredited Laboratory and supervised by Construction Supervision Consultant

Environmental Attribute	Timing	Parameter	Standards	Frequency	Duration	Location	Total no. of Samples during construction and operation stage.	Implementation
Noise	Construction	Noise Levels on dB (A) scale	Noise rules 2000 by CPCB	1 locations for 3 Seasons for 2 consecutive years.	Leq in dB(A) of daytime and night-time	Near the working zones, sensitive receptors and construction plant sites.	6	Contractor through NABL accredited Laboratory and supervised by Construction Supervision Consultant
	Operation			1 locations for 3 Seasons for 1year.		At 01 locations during operation stage where monitoring had been done during construction stage	3	Contractor through NABL accredited Laboratory and supervised by Construction Supervision Consultant
Soil	Construction	Monitoring of Pb, SAR and Oil and Grease	(IS): 2720 for 'Method of Test for Soils'	1 locations for 3 Seasons for 2 consecutive years.	Grab Sampling	Soil at 1 location 3 times a year for 24 Months At 2 locations	6	Contractor through NABL accredited Laboratory and supervised by Construction Supervision Consultant
	Operation			1 locations for 3 Seasons for 1Year		During operation stage where monitoring had been done during construction stage	3	Contractor through NABL accredited Laboratory and supervised by Construction Supervision Consultant

*Except Monsoon

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Social Monitoring will be done during Construction stage of the proposed Project as per the details provided in Table 8.3.

Table 8.3: Social Monitoring Plan

Indicator Category	Responsibility	Performance Indicators	Data Collection Method	Frequency
Resettlement & Livelihood Restoration	RP Implementation consultant/ MPWD	% of affected households receiving compensation & assistance	Household surveys, payment records	Quarterly
Labour & Working Conditions	Contractor/ CSC/ MPWD	Compliance with fair wages, working hours, safety	Labour camp inspections, interviews	Monthly
		% of local workforce employed in project	Contractor reports	Quarterly
Social Inclusion & Gender	RP Implementation consultant/ Contractor/ MPWD	% of women engaged in livelihood activities	Beneficiary tracking	Quarterly
Stakeholder Engagement & Grievance Redressal	RP Implementation consultant/ Contractor/ MPWD	No. of community consultations held	Consultation records	Bi-annually
		% of grievances resolved within set timeline	GRM logs	Quarterly
Indigenous Peoples & Cultural Heritage	RP Implementation consultant/ Contractor/ MPWD	Documentation of FPIC & community agreements	Meeting records, video/audio evidence	Ongoing
		No. of cultural sites protected/enhanced	Site inspections, community feedback	Annually

8.6 Reporting System

Reporting system for the project operates at two levels:

- Reporting for environmental condition indicators and environmental & social management indicators at site level
- Reporting for operational performance indicators at the PWD level.

The reporting system for environmental condition indicators and environmental and social management indicators is managed by the Contractor CSC, and E&S Cell - MPWD. The reporting system is presented in **Table 8.4**. Reporting formats prepared by the CSC/PMC for the Contractor will serve as the basis for implementation by the Contractor and monitoring by the CSC, E&S Cell - MPWD. The list of reporting formats prepared for the project is presented in **Table 8.5**.

- The reporting system shall start with the Construction Contractor who is the main executor of the implementation activities. The Contractor will report to the Project Management Consultant (PMC), who in turn shall report to the E&S cell MPWD.
- Contractor will prepare its monthly and quarterly report format and get approval from CSC/PMC and likewise CSC/PMC will get approval of MPWD on its formats before reporting.
- The Contractor shall prepare formats and submit monthly and quarterly environmental and social compliance reports along with formal monthly and quarterly overall project reporting to the CSC.

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- The CSC/PMC shall submit separate quarterly environmental and social monitoring reports to E&S cell MPWD in addition to submission of the summary of the activities of the month in the formal monthly report including any deviations and corrective actions
- E&S cell MPWD /CSC will be responsible for the preparation of the targets for identified non-compliances.
- Solutions for further effective implementation may also emerge as a result of the compliance monitoring reports.
- Environmental and Social Management Compliance Certificate shall be issued by Environment Specialist of CSC/PMC during the submission of each Interim Payment Certificate (IPC). This certificate will be based on compliance status of environmental and social measures during that tenure for which IPC has been produced.
- Photographic records will be kept to provide useful environmental monitoring tools. All material source locations, debris disposal locations, plants locations, Construction camp locations, Crusher locations etc. will have a complete photographic record. Photographs for all these establishments will be taken prior to establishment activities begin, during the establishment and operation process and after rehabilitation. The record will be submitted to CSC/PMC half yearly and will also be availed to PMC/ E&S cell MPWD, as and when required.
- A full record of construction activities shall be kept as a part of normal contract monitoring system.
- The operation stage monitoring reports may be annual, provided the Project Environmental and social completion report shows that the implementation was satisfactory.

This reporting will be as follows:

- Contractor reporting to the CSC (During construction), PMC
- CSC, PMC reporting to the ESMU / MPWD
- ESMU/MPWD reporting to the World Bank

Table 8.4: Reporting System for environmental & social management indicators

Items	Contractor	Project Management Consultant (PMC)		ESMU (MPWD)		World Bank (WB)
	Implementation& Reporting to PMC /CSC	Supervision	Reporting to MPWD	Oversee Compliance Monitoring	Report to WB	Desired Supervision
Construction Stage						
Monitoring of Construction Site and Construction Camp	Before start of work	Regular	Monthly		Quarterly	Quarterly
Pollution Monitoring	As required	As required	Quarterly	Quarterly	Quarterly	Quarterly
Debris Disposal Area	Weekly	Regular	Monthly	Quarterly	Quarterly	Quarterly
Monitoring of Enhancements	Implementation	As required	Quarterly	Quarterly	Quarterly	Yearly

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Topsoil Preservation	Weekly	As required	Monthly	Quarterly	Quarterly	Yearly
Borrow Area/Quarry Area	Regular	Regular	Monthly	Quarterly	Quarterly	Yearly
Tree Cutting	-	-	-	Quarterly	Quarterly	Yearly
Grievance from construction site	Regular	As required	Monthly	Monthly	Monthly	Yearly
Operation Stage						
Pollution Monitoring	For one year	As required	Quarterly	As per monitoring plan	-	-

Table 8.5: Reporting System for operational performance indicators

Item	Stage	Contractor	Project Management Consultant (PMC)	
		Implementation & reporting to PMC	Supervision	Reporting to ESMU
Approval of Construction Camp/Plant Site and its Management Plan	Pre-Construction	One Time	One Time	One Time
Approval of Borrow Management Plan (General & Specific)	Pre-Construction	General –One Time Specific re- development plan - one for each borrow area	Regular	Quarterly
Construction Camp and Plant Site Management	Construction	Monthly	Regular	Quarterly
Topsoil Management	Construction	Monthly	Regular	Quarterly
Pollution Control and Construction Plants	Construction	Monthly	Regular	Quarterly
Pollution Monitoring	Construction and Operation	-		Quarterly
Vehicles and Pollution Control	Construction	Monthly	Regular	Quarterly
Details of the DG Sets and Pollution Control	Construction	Monthly	Regular	Quarterly
Details of Oil Storage	Construction	Monthly	Regular	Quarterly
Working at Water Courses & Pollution Control	Construction	Monthly	Regular	Quarterly
Details of Water Extraction	Construction	Monthly	Regular	Quarterly

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Details of Personal Protective Equipment	Construction	Monthly	Regular	Quarterly
Status of Consent for Water Extraction	Construction	Quarterly	Quarterly	Quarterly
Deviations and Corrective Actions	Construction	—	Monthly	Quarterly
Implementation of Enhancement Measures for Cultural Properties, Water Harvesting Structures	Construction	Monthly	Regular	Quarterly
Debris generated by the hill ward side widening, cutting of hill slopes	During construction	Throughout the construction period	Regular	Quarterly
Grievance Redressal Mechanism during Construction	During Construction	Monthly	Regular	Monthly
Work Force Management	During Construction	Monthly	Regular	Quarterly
Occupational Health Safety Measures	During Construction	Monthly	Regular	Quarterly
Road Safety Measures	During Construction	Monthly	Regular	Quarterly
Accidents Reporting	During Construction	Monthly	Regular	Quarterly

During regular monthly meetings, environmental and social aspects should be discussed, with the staff responsible for implementing the Environmental and Social Management Plan from the Contractor, CSC, PMCan and MPWD/ESMU

Environmental Monitoring Cost

The environmental monitoring budget has been estimated based on the project's length and the existing environmental conditions along the proposed alignment. A total of INR 2,07,000 has been projected to cover environmental monitoring activities during both the construction and operation stages. Detailed cost estimates of Environmental Monitoring are provided in **Table 8.6**.

Table 8.6: Environmental Monitoring Cost

S. No.	Environmental Attribute	Stage	Locations / Seasons	Unit	Quantity	Unit Rate (INR)	Cost (INR)
1	Air quality monitoring	Construction	1 locations, 3 seasons, 2 years	No.	6	9,000	54,000
2	Air quality monitoring	Operation	1 locations, 3 seasons, 1 Year	No.	3	9,000	27,000
3	Water quality	Construction	1 locations, 3 seasons, 2	No.	6	7,000	42,000

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	monitoring		years (For surface and ground water each)				
4	Water quality monitoring	Operation	2 locations, 3 seasons, 1 year. (For surface and ground water each)	No.	3	7,000	21,000
5	Noise quality monitoring	Construction	1 locations, 3 seasons, 2 years	No.	6	3,000	18,000
6	Noise quality monitoring	Operation	1 locations, 3 seasons, 1 Year	No.	3	3,000	9,000
7	Soil quality monitoring	Construction	1 locations, 3 seasons, 2 years	No.	3	6,000	18,000
8	Soil quality monitoring	Operation	1 locations, 3 seasons, 1 Year	No.	3	6,000	18,000
	Total						2,07,000

8.7 Institutional Framework of the Project

The Meghalaya Infrastructure Development and Finance Corporation (MIDFC) will implement the MLCIP, leveraging World Bank experience from projects such as the *Meghalaya Integrated Transport Project (MITP)*, where a PMU coordinates activities across implementing agencies. E&S project staff under the PIU which is the PWD, Government of Meghalaya (MPWD) will manage safeguards as per the World Bank's Environmental and Social Framework (ESF). This will build considerable experience for MIDFC and the MPWD on WB procedures, especially in managing complex issues on resettlement, tribal land rights, biodiversity in hilly terrains, and engagement with Sixth Schedule institutions. Therefore, existing capacities must be leveraged such that experienced personnel are on-boarded during the preparation stage and lessons from past projects are duly integrated.

The project will be implemented through the MPWD, with MIDFC as the central PMU. Respective PIUs will be set up in the Department of Agriculture & Meghalaya Basin Management Agency (MBMA). A Project Management Consultant (PMC) and Construction Supervision Consultant (CSC) will also be engaged to backstop the PMU/PIU on specific technical, institutional, and monitoring tasks. The PMU, PIUs, PMC, and CSC must be adequately staffed with competitively recruited E&S Specialists to support preparing site-specific ESIs for DPRs and other E&S documents.

8.7.1 Governance and Overall Institutional Structure of the Project

The implementation arrangements will align with the current institutional architecture of the Government of Meghalaya (GoM), incorporating Sixth Schedule provisions for tribal autonomy. The MIDFC, responsible for overall project coordination and financing, will be the project holder and lead implementing agency. The MPWD will oversee civil works (roads, bridges, and ropeways), while Department of Agriculture (DoA), and MBMA will implement agrologistics and community components.

The MIDFC-PMU will oversee overall project management and coordination through officers experienced in World Bank procedures. The PMC, a team of experts and consultants headed by a Team Leader, will provide technical support for project activities that exceed the skill set of implementing agencies. The CSC

Disclaimer: This is a Draft Version and is being reviewed by the World Bank will provide construction supervision. Additionally, the PMC/CSC will assist in collating information and documenting the same. The project implementation structure is shown in **Figure 8.1**.

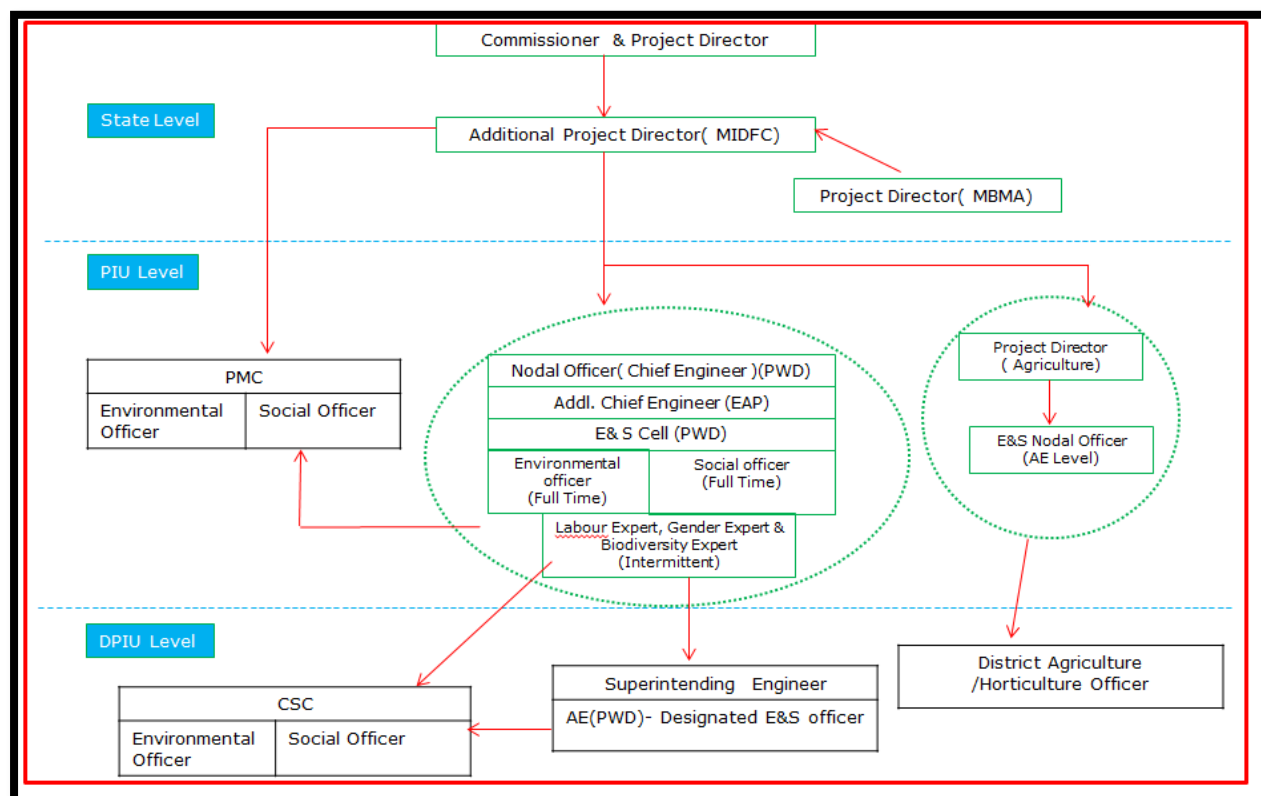


Figure 8.1 Project Implementation Organogram

Meghalaya Infrastructure Development and Finance Corporation (MIDFC) – Project Management Unit (PMU)

The Meghalaya Infrastructure Development and Finance Corporation (MIDFC) serves as the state’s nodal agency for planning, financing, and implementing major infrastructure and development projects across Meghalaya.

The Project Management Unit (PMU) under MIDFC serves as the central coordinating body providing strategic direction, policy alignment, and oversight for the project’s implementation. It manages planning, budgeting, and inter-agency coordination between PWD and MBMA, ensuring compliance with World Bank ESF, national, and state safeguard regulations and leads stakeholder engagement. Key officials include the Commissioner & Project Director, Additional Project Director (MIDFC), and specialized Procurement, Financial, and E&S Experts.

Project Implementation Unit (PIU) – Meghalaya Public Works Department (MPWD)

The Project Implementation Unit (PIU) under MPWD is the main agency implementing MLCIP’s road and connectivity components. It prepares DPRs, manages procurement, and oversees construction through Divisional PIUs and Supervision Consultants. The PIU ensures technical quality, environmental and social safeguard compliance, and coordination with local institutions. It reports progress to the PMU (MIDFC)

Disclaimer: This is a Draft Version and is being reviewed by the World Bank and conducts capacity-building activities for field staff and contractors. Key officials include the Nodal officer (Chief Engineer -Roads), Additional Chief Engineer (EAP), Nodal Officer (Environmental), Liaison Officer (Social) and E&S Officers.

Project Implementation Unit (PIU – MBMA/DoA) for Agrologistics

The PIU within MBMA implements the Agrologistics Component, focusing on value chain enhancement, storage, processing, and market linkages. It identifies and develops agrologistics infrastructure, partners with agribusinesses and FPOs, and promotes sustainable, gender-inclusive models. The PIU ensures safeguard compliance, aligns logistics infrastructure with PWD connectivity works, and builds capacity among farmers and entrepreneurs. Key officials include the Project Director (MBMA), Nodal Officer (Agrologistics), and Social & Environmental Specialists responsible for technical coordination and safeguard adherence.

Divisional Project Implementation Units (DPIU – PWD)

Each DPIU under PWD acts as the field-level unit implementing infrastructure works through contractors under PIU and SC supervision. It ensures quality, safety, and timely execution, coordinates with district authorities and traditional institutions, monitors ESMP compliance, and submits progress reports to the PIU. DPIUs also facilitate community engagement and grievance redressal.

District Project Implementation Unit (DPIU –DoA / MBMA)

The DPIU under MBMA implements district-level agrologistics projects, linking FPOs, cooperatives, and private partners to strengthen value chains. It manages civil and non-civil works, oversees procurement, and ensures safeguard compliance. The unit coordinates with traditional institutions for site selection and promotes sustainable business models for the long-term operation of agrologistics facilities.

Project Management Consultant (PMC)

The Project Management Consultant (PMC) provides technical, managerial, and E&S support to the PMU and PIUs. It assists in DPR preparation, safeguards integration, progress monitoring, and capacity building, ensuring project quality, compliance, and timely implementation across all components.

Supervision Consultant:

The Supervision Consultant (SC) oversees on-site construction to ensure adherence to technical, contractual, and safeguard standards. It monitors quality, safety, and environmental compliance, verifies progress, supports DPIUs in documentation, and reports any deviations to the PIU for corrective action.

Project implementation will be guided by a comprehensive Project Operations Manual (POM), to be prepared by the PMU with support from the Project Management Consultant (PMC). Each implementing entity will provide its respective inputs, and the POM will be finalized within three months of the project's effectiveness date. The Project Operations Manual (POM) will be closely aligned with the Environmental and Social Management Framework (ESMF) to ensure that environmental and social safeguard processes are fully integrated into project planning, implementation, and reporting. It will

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include detailed operational guidance on screening, risk categorization, preparation of Environmental and Social Impact Assessments (ESIAs), and implementation of Environmental and Social Management Plans (ESMPs). The POM will also define roles and responsibilities of the PMU, PIUs, and DPIUs in environmental and social compliance, outline reporting formats, and specify timelines for monitoring and audits. This alignment will ensure uniform application of safeguard measures across all project components, promote accountability, and strengthen the overall monitoring and evaluation (M&E) system under MLCIP.

8.7.2 Institutional Arrangement for E&S Management

- ❖ **Project Management Unit (PMU):** MIDFC will constitute a PMU, drawing from the pool of officers that already have experience with the World Bank procedures. PMU will be responsible for management and coordination of project implementation.
- ❖ **Project Implementation Unit (PIUs):** MIDFC will be supported by PIUs in the Public Works Department (Roads & Bridges), Agriculture, Horticulture, and MBMA, GoM. There will be Nodal Officers at E&S at all the PIUs. The PIUs will have Nodal Officers with assigned charge for E&S. They will not only oversee the implementation of Environmental and Social Codes of Practice during the construction but will also support in the integration of the environmental and social aspects into the agrologistics and community interventions. Currently, there is limited E&S staff in the PIUs – especially at Agriculture and MBMA levels such capacities will be required (and client has agreed to mobilize them before implementation begins).
- ❖ **Environment and Social (E&S) Cell :** Established within PWD, headed by the Additional Chief Engineer (EAP), and supported by two Executive Engineers, Environmental Officer (full-time), Social Officer (full-time), Labour Expert (intermittent), Gender Expert (intermittent), Biodiversity Expert (intermittent) and support staff. The E&S Cell will provide support to MIDFC and PIUs across all project stages:
 - Preparatory: Screening, assisting ESIA preparation, integration into DPRs, assisting PMC/CSC for statutory clearances
 - Implementation: Site inspections, monitoring, capacity building
 - Post-Implementation: Audits, lessons learned
- ❖ **Project Management Consultant (PMC):** The technical support for implementation of project activities that are beyond skill-set of implementing agencies will be brought in by the PMC, with a team of experts/consultants, headed by the Team Leader (TL). The PMC will have one Environmental and one Social Officer to support the PMU/PIU in the implementation of the ESMF for the project and the ESMP for each sub project. The Environment and Social Specialist will verify on site the implementation of the ESMP before each bill is submitted to PMU with recommendation for payment.
- ❖ **Construction Supervision Consultant (CSC)** The CSC will provide day-to-day supervision of construction works, with Environmental Specialist, Social Specialist, to ensure contractor compliance with ESMPs, OHS, labour standards, gender inclusion, and social safeguards.

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The implementation structure for the environmental and social management has been aligned to the institutional structure of the project. The E&S institution would help integrate the sustainability principle in the ESMF into the construction of roads, bridges, ropeways, and Agrologistics systems, and the use of infrastructure in agriculture and logistics interventions planned under this project. The PMU, PIUs, PMC, CSC, and the organizations supporting this project would ensure the effective engagement of stakeholders and handhold them through the project cycle to ensure that the project makes positive environmental and social benefits. The Institutional structure for implementation of the Environmental and Social Safeguard is presented in Figure 8-2.

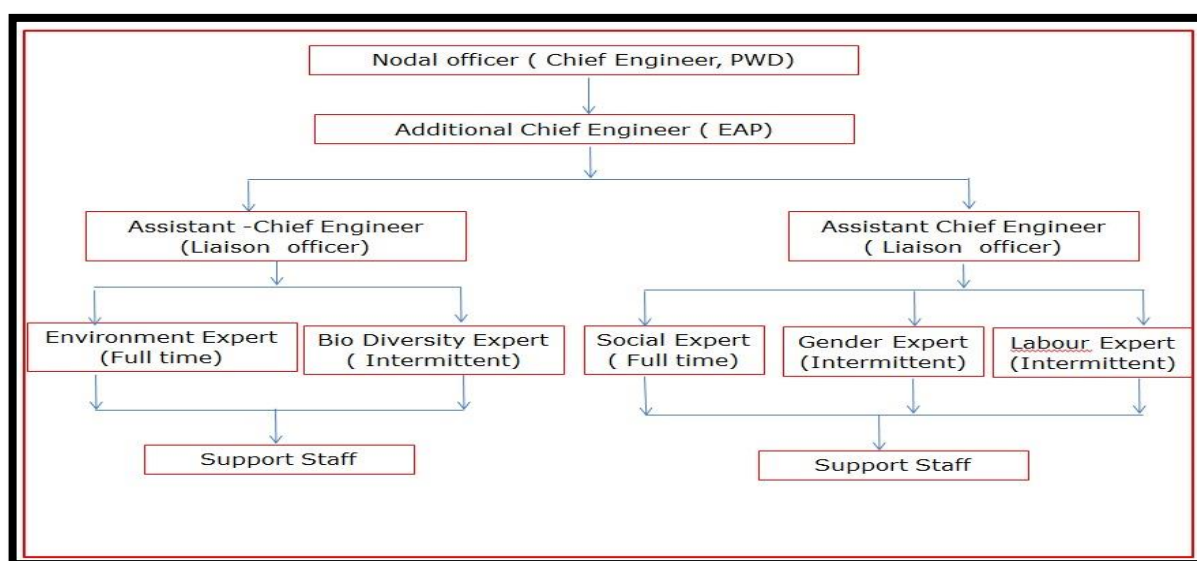


Figure 8.2: Organizational Structure of the E&S Cell

8.7.3 Roles and Responsibilities of Key Staff and Entities

The implementation of the Environmental and Social Management Framework (ESMF) under the Meghalaya Logistics Connectivity Improvement Project (MLCIP) will be supported by a multi-disciplinary team across the Project Management Unit (PMU), Project Implementation Units (PIUs), and field divisions. The key responsibilities of staff and entities involved are summarized below:

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Table 8.7: The Key Responsibilities of Staff and Entities

Designation	Institution / Entity	Core Roles and Responsibilities	Environmental & Social Responsibilities (ESF-linked)	Reporting / Coordination Line
Commissioner-cum-Project Director (PMU)	MIDFC / Government of Meghalaya	Provides overall leadership and strategic direction for MLCIP. Ensures policy alignment, resource allocation, and compliance with World Bank ESF and national/state laws. Chairs Project Steering Committee and oversees inter-departmental coordination.	Responsible for ensuring full ESF compliance, approval of ESMPs, oversight of land acquisition, labour management, stakeholder engagement, and reporting to World Bank.	Reports to Chief Secretary, GoM; Coordinates with PWD, MBMA, and World Bank.
Additional Project Director (MIDFC)	MIDFC	Supports the Commissioner in day-to-day project management, coordination, budgeting, and decision-making. Oversees PIUs and ensures timely implementation and reporting.	Supervises implementation of ESMF, monitors environmental and social safeguard performance, ensures disclosure and grievance redress follow-up.	Reports to Commissioner-cum-Project Director; coordinates with PIUs, consultants, and PMU specialists.
Project Director (MBMA)	Meghalaya Basin Management Agency	Leads agrologistics component implementation, ensures integration of agricultural value chains, market linkages, and climate-resilient infrastructure.	Ensures compliance with ESS5 (Land Acquisition), ESS7 (Indigenous Peoples), and ESS10 (Stakeholder Engagement). Guides community consultations and inclusion of women	Reports to Additional Project Director, MIDFC; coordinates with Agriculture, Horticulture, and FPOs.

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Designation	Institution / Entity	Core Roles and Responsibilities	Environmental & Social Responsibilities (ESF-linked)	Reporting / Coordination Line
			and tribal groups.	
Nodal Officer Cum Project Director (Chief Engineer, PWD)	Public Works Department	Heads design, technical standards, and construction quality control for connectivity works. Integrates environmental and social considerations in DPRs and tendering.	Ensures engineering designs include environmental safeguards, slope protection, and labour-safety features. Supervises PIU-PWD E&S compliance.	Reports to Commissioner (PMU) and coordinates with PIU engineers and E&S Cell.
Additional Chief Engineer (EAP)	PWD (Externally Aided Projects Wing)	Supports coordination with contractors and consultants for schedule, budget, and compliance.	Monitors contractor adherence to ESMP and safety standards. Provides quality assurance and periodic technical audits.	Reports to Chief Engineer; liaises with PMU and supervision consultants.
Environmental Expert	E&S Cell, PIU (PWD/MBMA)	Leads environmental screening, scoping, and monitoring of subprojects. Advises on mitigation measures, pollution control, and natural resource management.	Ensures ESMP implementation, site inspections, contractor environmental performance, and reporting under ESS1 and ESS3.	Reports to Additional Chief Engineer (EAP) and Nodal Officer/Chief Engineer, PWD.
Social Expert	E&S Cell, PIU (PWD/MBMA)	Conducts social screening, stakeholder consultations, and supervises RAP and IPDP implementation.	Monitors ESS5, ESS7, ESS10 compliance, supports GRM operation, and prepares social	Reports to Additional Chief Engineer (EAP) and Nodal Officer/Chief Engineer, PWD.

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Designation	Institution / Entity	Core Roles and Responsibilities	Environmental & Social Responsibilities (ESF-linked)	Reporting / Coordination Line
		Ensures fair compensation and livelihood restoration.	audit reports.	
Gender Expert (Intermittent)	E&S Cell (PIU/PMU Shared)	Provides technical input on gender inclusion, women's employment, and gender-based violence prevention strategies.	Implements Gender Action Plan (GAP) and ensures compliance with ESS2 and ESS10.	Advises and reports to E&S Cell, PIU
Labour Expert (Intermittent)	E&S Cell (PIU/PMU Shared)	Advises on labour welfare, OHS standards, and contractor compliance. Conducts periodic labour audits and site safety training.	Ensures compliance with ESS2, BOCW Act 1996, and national labour codes. Supports management of worker grievances.	Advises and reports to E&S Cell, PIU
Biodiversity Expert (Intermittent)	E&S Cell (PIU/PMU Shared)	Provides expertise on ecological sensitivity, biodiversity conservation, and compensatory afforestation plans.	Ensures compliance with ESS6 (Biodiversity Conservation), screens sites for ecological risk, and develops mitigation strategies.	Advises and reports to E&S Cell, PIU and coordinates with Forest Department.
Environmental Expert	Project Management Consultant (PMC)	Supports PMU and PIU in reviewing environmental documents, conducting audits, and quality assurance for ESMP implementation.	Verifies compliance with ESS1, ESS3, ESS4, and national environmental laws. Provides training inputs.	Reports to PIU and PMC Team Leader.

MLCIP - Improvement of Ampati to Purakhasia Road (AP) from 20th to 28th Km **ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT REPORT**

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Designation	Institution / Entity	Core Roles and Responsibilities	Environmental & Social Responsibilities (ESF-linked)	Reporting / Coordination Line
Social Expert	Project Management Consultant (PMC)	Advises on social safeguards, assists in RAP and IPDP implementation, and monitors GRM effectiveness.	Ensures ESS5 and ESS10 compliance, conducts stakeholder engagement verification, and prepares review reports.	Reports to PIU and PMC Team Leader.
Project Director (DPIU)	Divisional/District PIU (PWD/MBMA)	Leads division/district-level implementation, supervises contractors, and coordinates community liaison. Ensures field-level compliance with ESMPs.	Implements safeguard measures locally, supervises labour conditions, safety, and community consultations.	Reports to PIU Project Director and PMU.
Environmental & Social Officer	DPIU	Supports Project Director (DPIU) in monitoring E&S compliance, maintaining records, and conducting field verification.	Implements ESMP at site, manages grievance records, and reports progress to PIU.	Reports to DPIU Project Director and PIU E&S Cell.
Environmental Expert	Supervision Consultant	Conducts day-to-day site inspections, monitors ESMP compliance, and prepares environmental progress reports.	Ensures mitigation measures are implemented and recommends corrective actions for non-compliance.	Reports to PIU and PMC.
Social Expert	Supervision Consultant	Monitors social safeguards on-site,	Ensures adherence to RAP and IPDP	Reports to PIU and PMC.

MLCIP - Improvement of Ampati to Purakhasia Road (AP) from 20th to 28th Km **ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT REPORT**

Disclaimer: This is a Draft Version and is being reviewed by the World Bank

Designation	Institution / Entity	Core Roles and Responsibilities	Environmental & Social Responsibilities (ESF-linked)	Reporting / Coordination Line
		manages community engagement and grievance redress, and reports social performance.	commitments and ESS5 compliance.	
Project Director (Agriculture) / E&S Nodal Officer (Agrologistics)	Department of Agriculture / MBMA	Coordinates agrologistics subprojects, ensures integration of production, storage, and market infrastructure.	Ensures compliance with ESS3, ESS7, and ESS10. Oversees environmental management of cold-chain and market facilities.	Reports to Project Director (MBMA) and coordinates with District Agriculture Officers.
District Agriculture Officer	Department of Agriculture	Implements agrologistics facilities at field level, supports FPOs, and supervises sustainability practices.	Ensures environmentally sustainable operations and equitable access for smallholders and women farmers.	Reports to E&S Nodal Officer (Agrologistics) and MBMA.
Contractor	Contractor Team EHS	Executes construction in compliance with technical and E&S requirements. Prepares Contractor's ESMP (C-ESMP) and maintains OHS measures.	Ensures compliance with ESS2, ESS3, ESS4, and ESS10, manages worker welfare, waste disposal, and safety.	Reports to DPIU/PIU; supervised by Supervision Consultant.

Under the institutional arrangement for MLCIP, strict enforcement mechanisms ensure accountability in environmental and social (E&S) compliance. A 1% retention from each contractor bill is applied for E&S non-compliance. The issue must be rectified within two billing cycles, failing which the amount is forfeited. More than

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five forfeitures trigger contract termination and encashment of the Environmental and Social (ES) Bank Guarantee
by the PMU.

9. GRIEVANCE REDRESSAL MECHANISM

9.1 Introduction

Effective grievance redressal mechanisms ensure good governance, accountability, and transparency in managing and mitigating the environmental and social issues of a particular project. This consists of defining the process for recording/receiving complaints and their redressal in respect of environmental and social matters.

An integrated system will be established with Grievance Redressal Cells (GRCs), with necessary officers, officials, and systems at MIDFC (PMU). Grievances, if any, may be submitted through various mediums, including in person, in written form to a noted address, e-mail, or through direct calls to concerned official/s. The Social and Environmental Expert within PMU shall be responsible for coordination of grievance/complaints received.

The grievance redress mechanism should be in place at the time of initiating the implementation of R&RAP and civil construction activities in the project area. A platform for grievance redressal should be organized and its regular meetings may be conducted so as to allow people to put forth their grievances. It will help the appropriate authority to find solutions and amicably address the issues. The project, apart from web-based mechanism, will have a two-tier grievance redressal mechanism, i.e., (1) at the project site level, (2) State level (PMU level) .

Web-based grievance mechanism: MIDFC website will include a link where affected person(s) can register their complaints online. A telephone number will also be on the website of MIDFC and the project sites, so that the general public can register their complaint with the PMU office. In case of grievances received through a toll-free number or web-based system, a person should be made in-charge of screening and resolution of the same/communicating with the concerned divisions for resolution of the same. The person in-charge, based on the nature of the complaint, should forward the same to the concerned official. A ticket or a unique number will be generated for all such complaints. The complainant should follow up based on that unique number. All calls and messages should be responded to within 15 days. If a response is not received within 15 days, the complaint should be escalated to the Project Director.

Tier I: Under this project, the local Village Employment Councils (VECs) and community-level organizations will function as nodal point for the first-tier grievance redress mechanism. The local Headman will serve as the focal point responsible for receiving, documenting, and addressing complaints and feedback from stakeholders.

The Tier I Grievance Redress Cell shall operate under the Chairmanship of the Divisional/District Project Director (DPD) and will include the Resident Engineer (representing the Engineer), Environmental and Social (E&S) Experts of Construction Supervision Consultant (CSC), Environmental and Social Officers from the Divisional Project Implementation Unit (DPIU), representatives from relevant line departments, and representatives from local institutions.

Upon receipt of a grievance, the focal point shall review and assess the complaint for resolution at the local level. If the grievance or dispute cannot be satisfactorily resolved at the VEC level within fifteen (15) days from the date of submission, the matter shall be escalated to the Project Management Unit (PMU)/ State Level for further review and mediation.

Tier II: If the aggrieved person is not satisfied with the decision of the site-level Grievance Cell, the grievance may be escalated to the PMU/State-level Grievance Redress Cell (Tier II). The Tier II Cell shall be chaired by the Secretary, Department of Planning, and shall include the Chief Engineer, Project Director, and Social Development Expert of the Project as members. The State-level Grievance Redress Cell shall review the case and provide its decision or recommendations within fifteen (15) days of receiving the grievance.

If the aggrieved person is not satisfied with the decision of the State-level Grievance Cell, they shall have the right to seek redress through the judiciary. The Project Proponent shall extend all necessary assistance and support to the aggrieved person in pursuing the matter before the judicial authorities.

9.2 Grievance Redressal Mechanism (GRM) Flowchart

The following flowchart illustrates the three-tier grievance redressal mechanism with responsibilities and timelines for resolution.

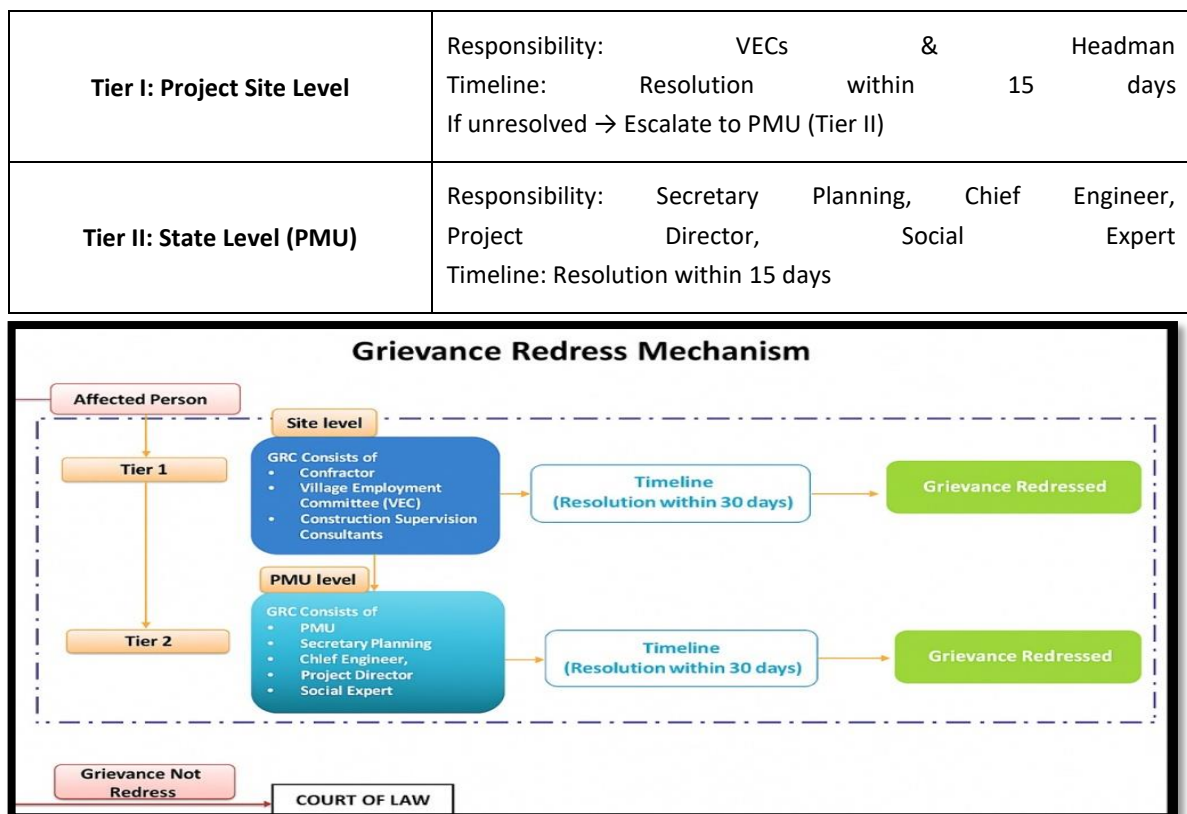


Figure 9.1: Grievance redressal Mechanism

(MIDFC website will include a link where affected person(s) can register their complaints online. A telephone number will also be on the website of MIDFC and the project sites, so that the general public can register their complaint with the PMU office)

9.2.1 Expanded Grievance Redressal Mechanism Details

To ensure the effectiveness and accessibility of the grievance redressal mechanism, it's crucial to elaborate on specific aspects of its implementation and operation. This includes detailed procedures, communication strategies, monitoring mechanisms, and capacity-building initiatives. Detailed Procedures for Grievance Submission and Processing

1. Multiple Channels for Grievance Submission:

In-Person: Designated officers at the project site and PMU office will be available during specified hours to receive grievances directly from affected persons. A standard form, available in local languages, will be provided to facilitate the submission process. The officer will assist individuals who may have difficulty filling out the form.

Written Submission: A dedicated postal address will be established for receiving written grievances. The address will be widely publicized through community meetings, public notices, and the project website.

Electronic Submission: The MIDFC website will feature a user-friendly online grievance submission portal. This portal will allow individuals to submit complaints in their preferred language. Upon submission, an automated acknowledgment will be sent to the complainant, along with a unique tracking number.

Toll-Free Helpline: A toll-free helpline will be operational during working hours, staffed by trained operators who can record grievances and provide information on the redressal process. The helpline number will be prominently displayed at project sites and in public areas.

Email Submission: A dedicated email address will be established for receiving grievances electronically. This address will be monitored regularly by the grievance focal point.

Details of contact for Grievances

Description	Contact details
Company:	PWD, Meghalaya
To:	Chief Engineer-cum-Nodal officer
Address:	HV9P+GFJ, Lachumiere, Shillong, Meghalaya 793001
E-mail:	esmlcip@gmail.com
Website:	http://megpwd.gov.in/contacts.html
Telephone:	Tel: 0364-3572466
Fax:	-

2. Grievance Logging and Acknowledgment:

All grievances received through any channel will be logged into a centralized Grievance Management System (GMS). The GMS will record the date of receipt, complainant details, nature of the grievance, and the assigned tracking number,

Within three working days of receiving a grievance, the complainant will be sent an acknowledgment letter or email, confirming receipt and providing the tracking number for future reference.

3. Grievance Screening and Assessment:

The grievance focal point will screen all logged grievances to determine their eligibility and relevance to the project. Grievances that are clearly outside the scope of the project or are frivolous will be rejected, with a clear explanation provided to the complainant.

Eligible grievances will be assessed to determine their severity, urgency, and complexity. This assessment will inform the prioritization and allocation of resources for investigation and resolution.

4. Grievance Investigation:

The grievance focal point will assign the grievance to the appropriate officer or department for investigation. The investigation will involve gathering information from relevant sources, including the complainant, project staff, community members, and technical experts.

The investigation will be conducted in a fair, impartial, and transparent manner. The complainant will be kept informed of the progress of the investigation and will be given the opportunity to provide additional information or clarification.

5. Grievance Resolution:

Based on the findings of the investigation, the grievance focal point will develop a proposed resolution, in consultation with relevant stakeholders. The resolution will aim to address the root cause of the grievance and provide a fair and equitable outcome for all parties involved.

The proposed resolution will be communicated to the complainant, along with an explanation of the rationale behind it. The complainant will be given the opportunity to accept or reject the proposed resolution.

6. Grievance Closure:

If the complainant accepts the proposed resolution, the grievance will be closed, and the outcome will be documented in the GMS.

If the complainant rejects the proposed resolution, the grievance will be escalated to the next tier of the grievance redressal mechanism.

9.2.2 World Bank Grievance Redressal System

The World Bank's Grievance Redress Services (GRS) provides a confidential mechanism for individuals and communities affected by World Bank financed projects to submit complaints regarding actual or potential harm. In the context of Meghalaya, integration of such a system must consider the state's complex socio-ethnic landscape.

Although community consultations did not report active social conflicts, secondary sources indicate the presence of inter-tribal tensions. Since its formation in 1972, Meghalaya has experienced ethnic conflicts between indigenous tribes and settler non-tribal communities. The dominance of business establishments, labor opportunities, and other economic sectors by settlers primarily economic migrants from Bangladesh, Nepal, and other parts of India created anxiety among the native population, culminating in three major ethnic riots between tribal and non-tribal communities.

By the late twentieth century, relations between ethnic communities showed relative improvement. While interactions between indigenous tribes and settler communities have largely stabilized, emerging tensions have shifted to dynamics among indigenous tribes themselves. This evolving context highlights the importance of a responsive grievance redress system, such as the GRS, that is sensitive to inter-tribal dynamics and ensures that all affected individuals can safely report concerns related to development projects.

Note: please visit <http://www.worldbank.org/GRS> / www.inspectionpanel.org.. For information on how to submit complaints to the World Bank Inspection Panel,

➤ **Conflict Resolution through Grassroots Institutions**

In Meghalaya, conflicts are often resolved within tribal communities through grassroots institutions, guided by uncodified customary laws and practices., the Nokma, function as quasi-judicial bodies to settle disputes, including those related to land. Decisions made by these institutions are widely regarded as legitimate and are generally respected and adhered to by community members, reflecting the continued importance of traditional governance systems in maintaining social harmony.

9.2.3 Communication Strategy

Community Awareness Campaigns: Conduct regular community awareness campaigns to inform local residents about the grievance redressal mechanism, its purpose, and how to access it. These campaigns will utilize a variety of communication channels, including community meetings, public notices, radio broadcasts, and social media.

Information Dissemination: Distribute information leaflets and posters in local languages, outlining the grievance redressal process, contact details, and timelines.

Stakeholder Engagement: Engage with local leaders, community representatives, and civil society organizations to promote awareness and understanding of the grievance redressal mechanism.

Website and Social Media: Maintain an up-to-date website and social media presence to provide information on the grievance redressal mechanism, including frequently asked questions, contact details, and progress updates on grievance resolution.

9.2.4 Monitoring and Evaluation

Grievance Tracking System: Implement a robust Grievance Management System (GMS) to track all grievances received, their status, and the outcomes of the redressal process. The GMS will generate regular reports on grievance trends, resolution times, and complainant satisfaction.

Regular Audits: Conduct regular audits of the grievance redressal mechanism to assess its effectiveness, identify areas for improvement, and ensure compliance with established procedures.

Complainant Feedback: Collect feedback from complainants on their experience with the grievance redressal mechanism. This feedback will be used to improve the quality of the service and ensure that it is meeting the needs of the community.

Key Performance Indicators (KPIs): Define and monitor key performance indicators (KPIs) to measure the effectiveness of the grievance redressal mechanism. These KPIs may include:

- Number of grievances received
- Percentage of grievances resolved within the target timeframe
- Complainant satisfaction rate
- Number of grievances escalated to higher tiers

9.2.5 Capacity Building

Capacity-building activities will include training grievance officers, creating awareness among community members on how to use the GRM, and guiding local leaders in resolving concerns at the community level. Further details are provided in the Capacity Development Chapter.

9.3 Integration with Project Management

Grievance Redressal as an Integral Part of Project Planning and Implementation: Integrate the grievance redressal mechanism into all stages of the project cycle, from planning and design to implementation and monitoring.

Coordination with Project Teams: Foster close coordination between the grievance redressal team and other project teams, such as the environmental and social safeguards team, the community engagement team, and the construction team.

Regular Reporting: Include regular reports on grievance redressal activities in project progress reports.

By implementing these detailed procedures, communication strategies, monitoring mechanisms, and capacity-building initiatives, the project can ensure that the grievance redressal mechanism is effective, accessible, and responsive to the needs of the community. This will contribute to building trust, promoting social harmony, and ensuring the long-term sustainability of the project.

10. CONCLUSION AND RECOMMENDATIONS

10.1 Conclusion

An Environmental and Social Impact Assessment Study was conducted to assess the potential environmental and social impacts of the project. Primary information about the project influence area was gathered using an Environmental and Social Screening Checklist to evaluate the extent of environmental and social impacts resulting from project interventions. Environmental and social baseline data were collected from secondary sources to depict the existing conditions of the project area accurately. This information serves as a foundation for assessing potential environmental and social impacts, as well as enhancing the accuracy of impact predictions. Additionally, public consultations and FPIC were held with stakeholders to incorporate their inputs and concerns. The key findings of the ESIA are summarized as follows:

- Proposed project will ease the traffic flow and create safe and smooth mobility to motor vehicles as well as pedestrians. The proposed road improvement can reduce travel time from the farthest section of the road to the nearby market from one hour to just 30 minutes. The project is imperative for encouraging more trade and commercial activity (including public transport) in the district of South West Garo Hills.
- The environmental and the social impact assessment have been conducted in accordance with World Bank ESF and National & State regulations. All the potential impacts were identified in relation to pre-construction, construction, and operation phases.
- The proposed project alignment does not pass through any Wildlife Sanctuary/National Park/Biosphere Reserve/Tiger Reserve.
- No ASI Protected monuments found within 0.5 km from the project site.
- Approximately 15 nos. of trees are located within the existing Right of Way (RoW) along both sides of the road. To mitigate the ecological impact of tree felling, compensatory afforestation should be undertaken in line with applicable environmental regulations and guidelines.
- The project road is expected to have some environmental and social impacts due to construction activities along the corridor, its proximity to culturally important sites such as community center, church, school, etc. and potential effects on Project-Affected Persons (PAPs) arising from access-related issues.
- Stakeholder Consultations were conducted to assess the perception of the people about the proposed project. The outcome of the consultations suggested that people are in general with the project because it will improve the present road conditions and connectivity. However, they also raised the requirement for the road safety measures; road furniture's (including streetlights, signage's, speed breaker etc.) and proper compensation for the loss of their assets.
- Occupational health and safety measures for both workers and the local community shall be ensured through the preparation and implementation of a comprehensive Labour Management Plan (LMP), in compliance with the World Bank's Environmental and Social Standard ESS2 on Labor and Working Conditions

- The mitigations will be further assured by a program of environmental and social monitoring conducted during construction and operation to ensure that all measures are implemented, and to determine whether the environmental and social conditions has stipulated or protected. This will include observations on- and off- site, document checks, and interviews with workers and beneficiaries, and any requirements for remedial action will be reported by the contractor to the MPWD.
- The ESMP shall be included in the bidding document along with appropriate contractual clauses for safeguarding the environment and social impacts during the project construction and operation (maintenance period).
- An overall project level and also construction stage level Grievance Redress Mechanism (GRM) will be formed to receive, feedback, suggestions and complaints, if any, from affected parties and addressing them during the construction stage and operation stage.
- The prepared ESMP will assist the Contractor and MPWD in mitigating the Environmental and Social impacts and guide them in the environmentally sound execution of the proposed project.

A copy of the updated ESMP shall be always kept on-site during the construction period. As per the World Bank policy requirements, the prepared safeguard documents shall be disclosed in the World Bank website.

During the field survey, as well as consultations with the Detailed Project Report (DPR) team and the Public Works Department (PWD), several key issues were identified. For each observation, appropriate mitigation measures have been proposed to minimize adverse impacts and ensure smooth project implementation. These observations and their corresponding recommendations are summarized in **Table 10.1**.

Table 10.1: Environmental and social assessment findings with mitigation measures

Chainage	EIS observation	Proposed
20+500	Observed soil erosion near the river bank	Protection work required at the riverbank due to soil Erosion.
21+200 to 21+300	On the LHS side of river bank, Observed soil erosion near the river bank	Eroding riverbank protection work needed (LHS)
22+600 to 23 +920	Observed Broken road, need improvement	-
23+200	Partially damaged culvert	Apron repairing required at Culvert Location
23+800	Government School. Speed reduction measures is to be adopted (20 KMPH)	Speed reduction measures
23+850	Observed erosion at the abutment location of the minor bridge	Protection work required at this section due to erosion at the abutment location of the minor bridge
25+200	Church, No Impact	-
25+300	JJM, No Impact	-
25+480	Observed Big Hole, Need repair	-
25+000	Observed Soil Erosion at the Riverbank (LHS)	River training work required due to Soil Erosion at the Riverbank (LHS)

25+300	Observed Curve improvement	Protection work needed a Minor Bridge Section. Curve improvement needed.
26+600, 26+650	Minor Bridge	-
25+850	Primary School, No Impact	-
27+100	Church, No Impact	-
27+350	Minor Bridge, No Impact	-
27+460	Observed Curve, improvement is required	Curve improvement needed by reducing the Curve radius to protect the Building Structure.
28+000	Observed Traffic at Junction	Junction Improvement by providing traffic islands.

10.2 Recommendations

- The Contractor should prepare a site-specific contractor's Environmental and Social Management Plan called as C-ESMP based on final design and identifications of locations of construction camps, quarries and borrow areas etc. within one month from the date of entering into the contract.
- MPWD to conduct required consultations regularly/periodically at Preliminary assessment, ESIA preparation, Before and after ESIA disclosure, Preparation of RAP and IPDP or when required with all the stakeholders, including local residents, village councils and public representatives and maintain the record of each consultation and meeting;
- MPWD to organize training for the capacity development of concerned staff of ESMU/PMC and district level MPWD engineers on ESHS policies, regulations, implementation, monitoring and reporting about the ESMP implementation before construction activities.
- Contractors will engage the experienced ES&HS Staff for ESMP implementation as well as to ensure imparting induction, work-specific and other required trainings to the workers;
- MPWD will support Project Affected Peoples (PAP) as per RAP prepared for the AP Road stretch.
- Contractor/ MPWD to ensure the compliance of applicable laws at state/national level and relevant policies and best practices.
- The shifting of public utilities will be planned in advance to maintain supply of electricity and telephone services to people without or minimum disruptions, with prior intimation through Media, newspaper and other mode of communication.
- MPWD to monitor the implementation and redress of grievances timely and amicably.
- The contractor to ensure safe access to vulnerable people such as elderly and people with disabilities during the construction stage.

ANNEXURES

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Annexure 2.2: Comparative Analysis of Existing State / National Legislations and World Bank ESF

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WB Environment and Social standards	Equivalent National and State Environment/ Social Policy/ Regulation	Policy Gaps, Remedies and Redressal
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 EIA Notification March 2020. The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013	Borrowing of the minor minerals (earth, sand, aggregates, etc.) for embankments, bridges, approach roads, trucks and bus halts, etc. will require permissions from SEIAA and will require prior environmental clearance under the mining of minor minerals category. The MPWD will ensure that the ESIA and ESMPs prepared during project design, forms a part of the bid documents. MPWD will also ensure that provisions laid down in ESMPs, are implemented through civil work contractors and monitored by the MPWD Divisions/ E&S Specialists of MPWD/ consultants.
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 Meghalaya 1952 Payment of Gratuity Act, 1972 The payment of gratuity rules Meghalaya 1972 Employees Provident Fund and Miscellaneous Provision Act, 1952 Maternity Benefit Act, 1951 Meghalaya Maternity benefit Rules 1965	The National And State legal provisions cover all requirements of ESMF. A Labour Management Procedures is prepared for MPWD to regulate working conditions and management of labour relations including worker specific GRM, terms and conditions of employment, code of conduct, non-discrimination and 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 are the provision of Code of Conduct for workers, GBV prevention measures, GRM for workers, etc., compliance to applicable labour laws, documentation on labour management by contractors and orientation training of civil work contractors and workers. The ESMP being prepared by the consultant need to ensure that the World Bank ESMF 2018 requirements are integrated in the document with adequate monitoring provisions. The consultant has to ensure relevant penalty clauses are integrated in the ESMP document to be attached to the bidding documents. The MPWD will ensure implementation of ESMP prepared by the

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WB Environment and Social standards	Equivalent National and State Environment/ Social Policy/ Regulation	Policy Gaps, Remedies and Redressal
	<p>Payment of Bonus Act, 1965 The Payment of Bonus Rules Meghalaya 1975 The Bonded Labour (Abolition) Act 1976 Bonded Labour System (Abolition) Rules 1976 The Trade Union Act, 1926</p>	<p>consultants by the contractors and it have to be monitored by the MPWD Divisions/ E&S consultants. The concerned Labour Officers will also be monitoring these.</p>
Resource Efficiency and Pollution Prevention and Management	<p>The Mines and Minerals (Development and Regulation) Act, 1957 Meghalaya Minor Mineral Concession Rules 2013 Meghalaya 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 amendments 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</p>	<p>The majority of World Bank ESMF 2018 requirements are directly addressed by existing regulations and indirectly for resource efficiency and climate change aspects, including pollution prevention and management. However, there are gaps in monitoring and reporting requirements, leading to insufficient data on pollution levels, resource consumption, and waste generation.</p> <p>Consultants preparing ESIA and ESMP will ensure relevant provision are integrated in these documents. Bidding documents too shall be integrated with the relevant provisions and this will be monitored by the MPWD Divisions/E&S Specialists of MPWD/ consultants. The MSPCB will also be monitoring these.</p>
Community Health and Safety	<p>The Gas Cylinder Rules 2016 Hazardous & Other Waste (Management and Trans-boundary Movement) Rules, 2016 Disaster Management Act, 2005 Meghalaya State Disaster Management Policy 2010 Solid Waste management Rules, 2016 Plastic waste management Rules, 2016 E-Waste Management Rules, 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</p>	<p>These existing laws and rules are to protect community health and safety. Hence, these laws and rules fulfill the community health and safety requirements. The BIS standards and building codes address the community health and safety requirements. In addition, an ESMP will be prepared to be implemented by the contractors, keeping community health and safety in mind.</p> <p>There is a gap in the consideration of excavation activities within sectors that may involve legacy contamination, which may pose risks to both occupational workers and the surrounding community. This policy gap highlights the need for clear regulatory guidance, mandatory site assessments prior to excavation, and integration of contamination risk management into project planning to prevent exposure, ensure worker</p>

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WB Environment and Social standards	Equivalent National and State Environment/ Social Policy/ Regulation	Policy Gaps, Remedies and Redressal
	(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	safety, and protect public health. MPWD will ensure that the consideration of excavation areas with legacy contamination and implementation of suitable safety measures are incorporated to address community health and safety. The ESMP prepared during project preparation and implementation shall deal with community health and safety which shall include an OHS plan, labour Influx management Plan, workers camp management plan, traffic and road safety management plan, construction phase safety etc.
LA, Restriction on Land Use and Involuntary Resettlement	The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 Meghalaya Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Rules, 2017 Street Vendors (Protection of Livelihood and Regulation of Street Vending) Act, 2014 & Meghalaya Street Vendors (Protection of Livelihood and Regulation of Street Vending) Rules, 2016 The Meghalaya Highways Act, 1972	Gap exists specifically related to aspects such as the identification of non-titleholders as PAPs and cut off dates for non-titleholders. The gaps will be addressed with suitable provisions in RPF. Consultants preparing ESIA and ESMP will ensure relevant provision are integrated in these documents. Bidding documents too shall be integrated with the relevant provisions and this will be monitored by the MPWD Divisions/E&S Specialists of MPWD/ consultants.
Biodiversity Conservation and Sustainable Management of Living Natural Resources	The Forest (Conservation) Act, 1980 and Amendments and The Forest (conservation) Rules 1981 and Amendments National Forest Policy 1988 Biological Diversity Act, 2002 Meghalaya Biodiversity Rules, 2010 Eco-sensitive Zone Notifications 2015 State Compensatory Afforestation Fund Management and Planning Authority Forest (Conservation) Amendment Rules, 2014 Meghalaya manages compensatory afforestation through the Meghalaya State Compensatory Afforestation Fund Management and Planning Authority (MSCAFMPA), established under the Compensatory Afforestation Fund (CAF) Act, 2016, Meghalaya Tree (Preservation) Act, 1976, Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)	The concept of ecosystem resource management in India is addressed through various environmental and forestry laws, policies, and guidelines. One of the key legislations in this regard is the Forest (Conservation) Act, 1980. While the main focus of this act is on the conservation of forests, it encompasses the sustainable management of ecosystem resources. It includes considerations for environmental impact assessments, compensatory afforestation, and wildlife conservation. Additionally, the National Forest Policy of India, last revised in 1988, provides a broader framework for the sustainable management of forest resources, including ecosystems. It outlines principles for maintaining environmental stability, preserving biodiversity, and ensuring the overall health of ecosystems. The Wildlife Protection Act, 1972 primarily focuses on wildlife conservation and not only emphasizes the protection of wild animals but also includes provisions related to the preservation and management of their habitats. The act designates specific areas as "protected areas," such as wildlife sanctuaries, national parks, and community reserves, with the aim of

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WB Environment and Social standards	Equivalent National and State Environment/ Social Policy/ Regulation	Policy Gaps, Remedies and Redressal
	EIA Notification 14th Sep 2006 and subsequent amendments	<p>conserving wildlife and maintaining ecological balance. Recognizing the vital role of habitats in the well-being of wildlife species, the act underscores the importance of declaring certain areas as protected zones to safeguard biodiversity.</p> <p>The Environmental Impact Assessment (EIA) process, governed by the Environment Impact Assessment Notification, 2006 addresses mitigation measures for projects that may have environmental and habitat implications.</p> <p>A significant policy gap exists in India, as there is no specific comprehensive law that explicitly mandates a 'net gain' standard for biodiversity or habitat conservation across the country. To bridge this gap and to align with the World Bank Environmental and Social Standards (particularly ESS6 on Biodiversity Conservation and Sustainable Management of Living Natural Resources), project-specific ESMPs should incorporate habitat treatment standards and apply net gain principles through a systematic and integrated approach to environmental and social management. In addition, the ESMP should address the presence and movement of wildlife outside protected areas and within the project road corridor, including critical habitats, by incorporating measures to identify, mitigate, and manage potential project impacts on these sensitive ecosystems through a dedicated Biodiversity Management Plan.</p> <p>The MPWD will ensure that the World Bank ESMF 2018 provisions are implemented through them and contractors and monitored by the PWD Divisions/ E&S Specialists of PWD/ consultants. The Forest Department and the concerned Wildlife Wardens will be monitoring the implementation of these measures.</p>
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.	Constitutional provisions define essential characteristics for a community to be identified as Scheduled Tribes and an area to be defined as Scheduled Area. The legislation on acquisition RFCTLAR&R mandates FPIC in Scheduled areas. Thus, the legislation meets the requirements of World Bank ESF 2018 including FPIC.

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WB Environment and Social standards	Equivalent National and State Environment/ Social Policy/ Regulation	Policy Gaps, Remedies and Redressal
	Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006	The MPWD will ensure that the World Bank ESMF 2018 provisions are implemented through them and monitored by the PWD Divisions/E&S Specialists of PWD/ consultants. The concerned Tribal Development Councils will monitor these provisions.
Cultural Heritage	Ancient Monuments and Archaeological Sites and Remains Act, 1958 and 1959 The Treasure Trove Act 1878	<p>The legislation meets the requirements of ESMF, mandating conservation of cultural and historical remains found within the country boundary. The Chance Finds procedures are available in the legislation. The chance find procedures will be included in ESMP. Impacts on religious structures (not protected, but social and cultural value) will be mitigated or managed through provisions for restoration.</p> <p>The PWD will ensure that the World Bank ESMF 2018 provisions are implemented through them and contractors and monitored by the PWD Divisions/ E&S Specialists of PWD/ consultants.</p>
Stakeholder Engagement and Information Disclosure	<p>EIA Notification 14th Sep 2006 and amendments till date. The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013</p> <p>Right to Information Act, 2005</p>	<p>The legislation partly covers this ESS with the Acts mandating the need to provide information when asked for. Almost all government agencies have GRM and Citizen Charters detailing the redressal and service services.</p> <p>Stakeholder Engagement Plan (SEP) or equivalent document that is accessible to all stakeholders will be prepared. Further, national or state laws may have varying degrees of inclusivity in decision-making processes, potentially leading to marginalized communities' concerns being overlooked.</p> <p>Forest rights, and eco system services of the community shall be captured during engagement by the consultants.</p> <p>The PWD will ensure that the World Bank ESMF 2018 provisions are implemented through them and contractors and monitored by the PWD Divisions/E&S Specialists of PWD/ consultants.</p>

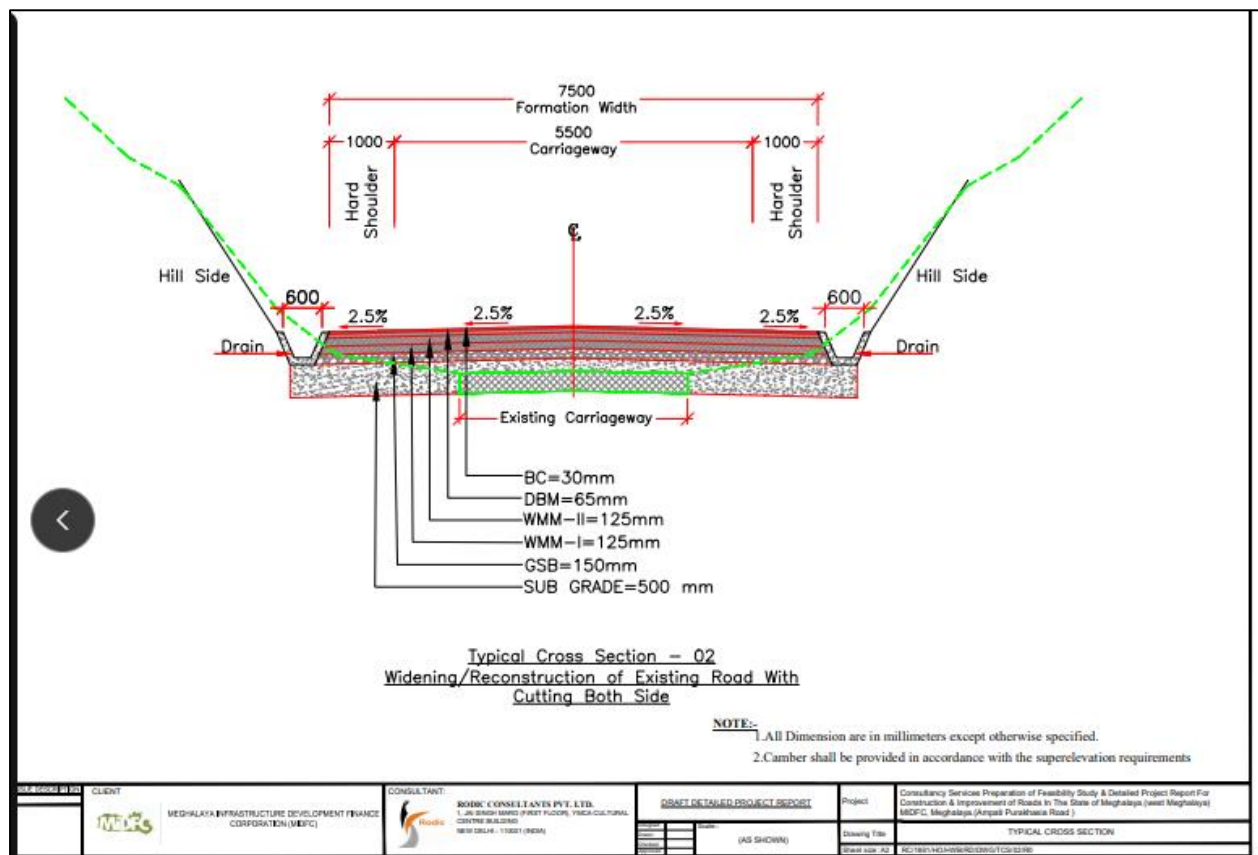
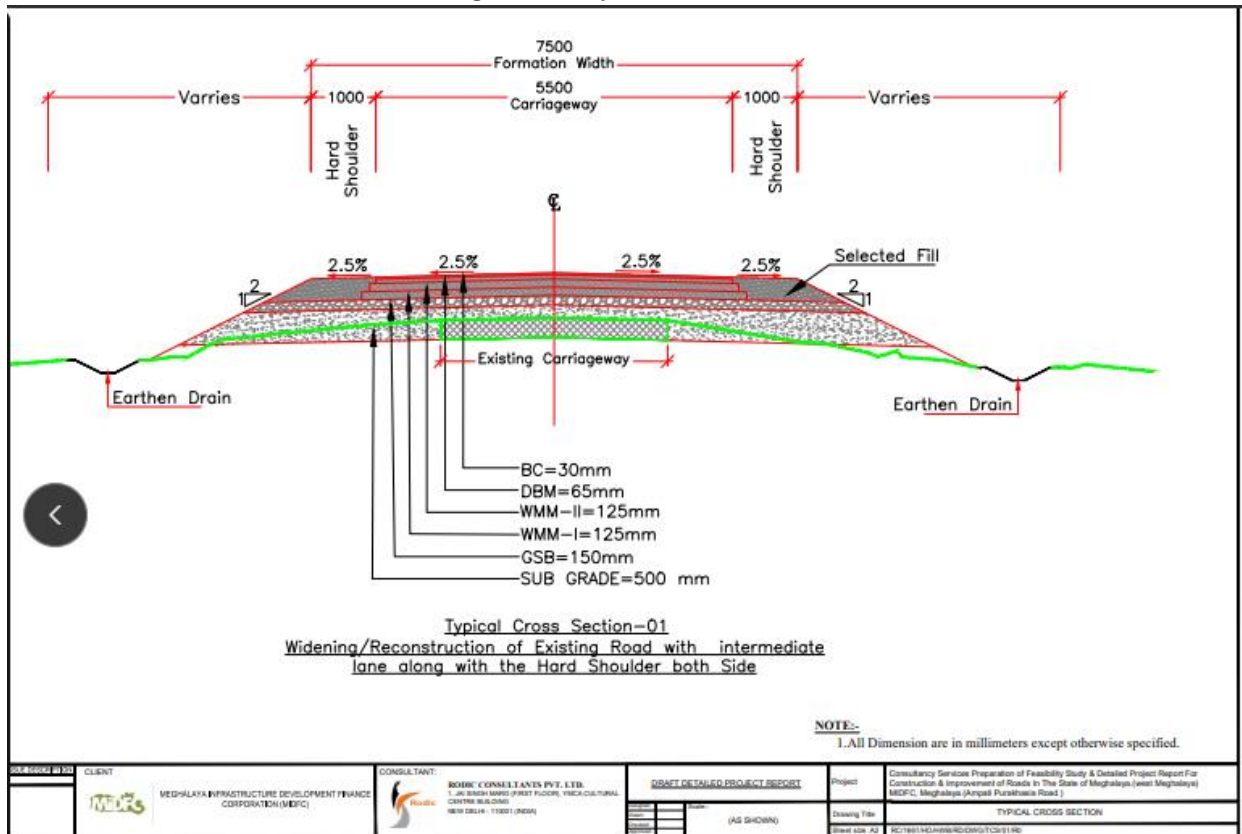
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Annexure 3.1: Proposed Road Cross-Sections

(a) Typical road cross sections for Corridor 8

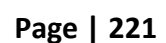
SL. No	From	To	Length	TCS Type	TCS Description
1	19000	21090	2090	TCS-1	Widening/Reconstruction of Existing Road with intermediate lane
2	21090	21170	80	TCS-2	Widening/Reconstruction of Existing Road with Cutting Both Side
3	21170	21320	150	TCS-4	Widening/Reconstruction of Existing Road in built-up section with footpath cum drain both side
4	21320	21470	150	TCS-3	Widening/Reconstruction of Existing Road With filling both Side
5	21470	21730	260	TCS-1	Widening/Reconstruction of Existing Road with intermediate lane
6	21730	21940	210	TCS-2	Widening/Reconstruction of Existing Road with Cutting Both Side
7	21940	22070	130	TCS-3	Widening/Reconstruction of Existing Road With filling both Side
8	22070	24420	2350	TCS-1	Widening/Reconstruction of Existing Road with intermediate lane
9	24420	24540	120	TCS-3	Widening/Reconstruction of Existing Road With filling both Side
10	24540	27410	2870	TCS-1	Widening/Reconstruction of Existing Road with intermediate lane
11	27410	27540	130	TCS-3	Widening/Reconstruction of Existing Road With filling both Side
12	27540	27670	130	TCS-1	Widening/Reconstruction of Existing Road with intermediate lane
13	27540	28039	499	TCS-4	Widening/Reconstruction of Existing Road in built-up section with footpath cum drain both side

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Typical Cross Section - 03
Widening/ Reconstruction of Existing Road
With filling both Side

NOTE:-
 1. All Dimension are in millimeters except otherwise specified.



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Annexure 3.2: Environment and Social Management Plan

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
	PRE-CONSTRUCTION					
1	Consents/ Permits/ Approvals/ Compliances	Non-compliance to various Environmental/ social/ regulatory requirements pertaining to the proposed project could lead to legal Implications	<ul style="list-style-type: none"> ➤ Obtain all necessary statutory clearances (CTE, CTO, Labour License, Fire NOC, Tree Cutting Permission, etc.) ➤ Renew permits before expiry. 	Contractor/ MPWD	CTE, CTO, Labour License, Fire NOC, Tree Cutting Permission to be submitted and tracked	MPWD/PMC/CSC
2	Land Procurement	Loss of Land/ Livelihoods	<ul style="list-style-type: none"> ➤ RPF and RAP shall be followed. 	MPWD division, contractor and concerned authorities	Compensation records maintained; Grievances resolved	MPWD/CSC/NGO
3	Contractor's ESMP (CESMP) Preparation and Implementation	Inadequate preparation and implementation of CESMP by Contractor can leave environmental and social issues unattended	<ul style="list-style-type: none"> ➤ The contractor needs to follow the project ESMP to formulate the CESMP and get it approved by MPWD. 	Contractor	Approved CESMP including TMP, LMP and other relevant plans, and implemented;	MPWD/PMC/CSC
4	Identification of land for material storage yard/ construction camp/ labour camp	Discharges from Yards/ Camps to pollute the surroundings and lead to social tension.	<ul style="list-style-type: none"> ➤ Contractor needs to identify suitable land for storage yard/ construction camp/ labour camp ➤ The land shall not be closer to the water bodies, waterlogged areas or wetlands. ➤ The land will be handed back to the owner in the same condition as it was prior to the commencement of project activities, once the project is completed. ➤ Contractor to produce the lease 	Contractor	Approved site location; Lease/NOC copies;	MPWD/PMC/CSC

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			agreements, NOC etc. for these lands.			
5	Supply of Construction Material	Sourcing materials from unauthorized sources.	➤ Procurement of construction material only from approved quarries and sites and licensed/ authorized vendors/ manufacturers. Contractor to produce approvals and receipts.	Contractor	EC, Permits, challans, Material source approval copies;	MPWD/CSC
6	Water	Pollution of surface and groundwater sources.	➤ The Contractor will be responsible for arranging adequate supply of water for the entire construction period. ➤ The contractor will minimize the pollution and wastage of water during construction	Contractor	Permission for Water source; Usage records; Wastewater management measures	MPWD/PMC/CSC
7	Appointment of Environment, Social and Safety Officers	Inefficient and incompetent supervision by contractors may lead to negative impacts on environment, Social, health and safety.	➤ The Contractor would prepare OHS plan and other required plans; as a part of CESMP, as per the WB guidelines. ➤ The contractor will appoint qualified and experienced Environment. Social and Safety personnel to ensure implementation of CESMP and occupational health and safety issues at the camps and construction work sites.	Contractor	To be mobilized before construction; approved OHS plan	MPWD/PMC/CSC
8	Identification of OHS Hazard and Risk Categorization	May cause physical harm, injury, illness, or death to workers.	➤ Conducting workplace inspections to identify hazards and document. ➤ Consulting with workers to identify hazards that may not be obvious to employers or safety professionals. ➤ Reviewing safety data sheets (SDSs) to collect information about the hazards of chemicals and other substances used in the workplace. ➤ Consulting with industry standards and regulations to identify specific hazards that must be addressed in the workplace.	Contractor	OHS hazard register; Inspection reports;	MPWD/CSC

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9	Other Construction Vehicles, Equipment and Machinery	Vehicles and equipment not complying with regulations may lead to pollution of environment.	➤ The contractor will maintain records of fitness and Pollution Under Control (PUC) certificates for all vehicles and generators used during the contract period	Contractor	Records of valid PUC / fitness; Inspection log	MPWD/PMC/CSC
10	Tree Cutting	Loss of green cover and biodiversity	<ul style="list-style-type: none"> ➤ Maximum efforts shall be made to minimize the number of trees to be felled. ➤ Tree cutting and disposal shall be done as per the Forest Dept. 	Contractor	Records of trees cut and saved.	MPWD/CSC
11	Joint field verification	The impacts may not have been identified in time.	➤ The MPWD and the Contractor shall carry out joint field verification to ascertain the local complaints/suggestions and to confirm the need for additional protection measures or changes in design/scale/nature of protection measures including the efficacy of enhancement measures suggested in the ESMP. The MPWD shall maintain proper documentation and justifications/reasons in all such cases.	Contractor	Verification reports;	MPWD
12	Damage to existing eco-system due to borrowing activities	Indiscriminate borrowing activities may damage the eco-system and lead to unproductive environment	<ul style="list-style-type: none"> ➤ The Contractor will have to obtain the Environmental Clearance for borrow areas. ➤ The borrow area will be operated as per the MoEFCC guidelines issued by the concerned SEAC and SEIAA. 	Contractor	Borrow area EC copy; Approved management and closure plan	MPWD /CSC
13	Identification of construction material transportation route	Inconveniences and safety issues to the public due to the material transport vehicles.	<ul style="list-style-type: none"> ➤ The material transport route through existing network of roads should be planned and approved by the local transport authorities. ➤ The local communities need to be consulted with prior information on any likely inconveniences. 	Contractor	Approved route plan; Community consultation record	MPWD/CSC
14	Identification of sites	Pollution due to	➤ MPWD Division and the Contractor are	Contractor	Approved disposal	MPWD/CSC

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	for debris disposal or wastes generated from construction camps and site offices	indiscriminate dumping of wastes. Wastes entering water bodies and groundwater causing pollution	responsible for identifying a suitable area in consultation with local administration to dispose of the wastes from labour camps, construction sites and site offices.		site and its management plan; NOC, Agreement with landowner; Waste disposal records;	
15	Relocation of Utility and Common Property Resources (CPR)	Loss of services from utilities and common property resources for the public	<ul style="list-style-type: none"> ➤ When the utilities/ Common Property Resources need to be shifted, they will be shifted in consultation with the communities and with least inconvenience to the public. ➤ If any displacement of Utility/CPRs is required, they will be relocated with prior approval of the concerned agencies. The relocation site identification will be in accordance with the choice of the community. 	Contractor/ MPWD Division	Records of Relocation completion.	MPWD/ PMC/CSC
CONSTRUCTION						
1	Crushers, Hot mix Plants & Batching Plants	Impacts due to establishment and operation of plants and equipment	<ul style="list-style-type: none"> ➤ Crushers, hot-mix and batching plants shall be located at least 1000m (1km) away from residential/ settlements, forests, wildlife movement areas, and commercial establishments, preferably in the downwind direction. ➤ The Contractor shall submit a detailed layout plan for all such sites and seek prior approval before entering into a formal agreement with a landowner for setting-up such sites. ➤ Specifications of crushers, hot mix plants, and batching plants shall comply with the technical requirements of the contract and prior Consent / NOC for all such plants shall be obtained. ➤ No such installation by the Contractor 	Contractor	Approved layout plan; Valid NOCs/Consents; Dust suppression records; Air quality monitoring reports	MPWD/PMC/CSC

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			shall be allowed till all the required legal clearances are obtained from the competent authority.			
2	Borrow Areas	Impacts due to improper operation and closing of borrow areas	<ul style="list-style-type: none"> ➤ Borrow area should be located at a minimum distance of 300m from the residential/ settlement area. Proper barricading should be provided and access to the borrow areas should be restricted to the unauthorized persons. ➤ The Contractor should submit the EC, a copy of agreement with the landowner, borrow area management and closure plan before initiating any kind of borrowing activities. 	Contractor	EC and lease copies; Approved Borrow area restoration and Closure plan	MPWD/PMC/CSC
3	Quarries	Impacts due to improper management, operation and closing of quarries	<ul style="list-style-type: none"> ➤ The Contractor shall identify materials from legally valid quarries with existing NOC from the relevant departments. ➤ No quarry or associated plants can be set-up within 1000m from the residential/ settlement locations ➤ Contractor shall prepare a haul road network for quarry transport and ensure the suitability of such haul roads from the safety of residents, biodiversity and other environment points of views. 	Contractor	Quarry permit, EC; Safety inspection report; Haul road maintenance record, dust suppression measure, geotagged photos	MPWD/PMC/CSC
4	Dismantling of Bridges/ Culverts/ Structures	Impacts due to improper dismantling and disposal	<ul style="list-style-type: none"> ➤ All necessary precautions shall be taken while working near cross-drainage channels, to prevent earthwork, stonework, construction materials from obstructing cross-drainage at rivers, streams, and drainage systems, or from causing flooding. ➤ Reusable materials (e.g., steel, stones, bricks) shall be segregated and stored 	Contractor	Debris disposal/reuse records; Approved Site restoration plan; Photographic documentation.	MPWD/PMC/CSC

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			<p>properly for reuse or recycling.</p> <ul style="list-style-type: none"> ➤ Non-recyclable debris and waste materials shall be transported to approved disposal sites identified and approved by the concerned authority. ➤ Disposal sites shall be located away from water bodies, agricultural lands, and other environmentally sensitive areas. ➤ Temporary barriers or silt fences shall be provided to prevent debris from entering watercourses. ➤ Upon completion, the associated disposal sites shall be restored to their original condition or as directed by the Engineer 			
5	Bituminous waste disposal	Impacts due to hazardous wastes	<ul style="list-style-type: none"> ➤ The contractor shall maintain records of quantities generated, transported, and disposed of, along with details of the disposal site and approvals obtained. ➤ Bituminous waste shall be collected and stored temporarily in impermeable, lined containers or areas to prevent leaching or contamination of soil and groundwater. ➤ The disposal of bituminous wastes shall be carried out by the Contractor at secure landfill sites approved by the concerned government authorities. ➤ No bituminous waste shall be disposed of in water bodies, open lands, agricultural fields, or along the roadside ➤ Periodic inspections shall be carried out to ensure compliance with waste 	Contractor	Records of Waste reused/disposed; Details of approved disposal site; Photographic documentation.	MPWD/PMC/CSC

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			<p>management guidelines.</p> <ul style="list-style-type: none"> ➤ Where feasible, recycling or reuse of scarified bituminous material in road base or other construction activities shall be promoted, subject to environmental and quality standards. 			
6	Contamination of Soil	Soil pollution due to Oil and fuel spills from construction equipment and plants.	<ul style="list-style-type: none"> ➤ Construction plants, workshops, and fuel storage areas shall be located at least 500 m away from any surface water body and environmentally sensitive locations. ➤ Oil interceptors shall be installed at construction camps, vehicle parking, and washing areas to trap oil and grease before wastewater is discharged. ➤ All fuel and lubricant storage tanks shall be placed on impermeable platforms or within bunded (contained) areas. ➤ Regular maintenance and inspection of construction equipment and vehicles shall be carried out to prevent leakage of oil, fuel, or hydraulic fluids. ➤ Spill control kits (absorbent pads, sand, and containment booms) shall be available at all fuel storage and handling locations. ➤ Used oil and lubricants shall be collected, stored in labelled, leak-proof containers, and handed over only to authorized aggregators/recyclers for disposal in compliance with applicable hazardous waste regulations. ➤ Records of fuel usage, storage, and waste oil disposal shall be maintained 	Contractor	Spill log; Waste oil disposal records; Fuel storage inspection record. Photographic documentation.	MPWD/PMC/CSC

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			<p>and made available for inspection.</p> <ul style="list-style-type: none"> ➤ Stormwater runoff from fuel and equipment storage areas shall be directed through oil-water separators before discharge. 			
7	Air Pollution - Dust Generation	Dust generation will cause air pollution and will have impacts on health and safety.	<ul style="list-style-type: none"> ➤ Vehicles delivering materials should be covered to reduce spills and dust blowing off the load. ➤ Water should be sprinkled regularly on the work sites. ➤ Road slopes to be covered immediately after completion. ➤ Speed limits shall be enforced for construction vehicles within and near project sites to reduce dust generation. ➤ Personal protective equipment (PPE) such as masks shall be provided to all workers exposed to dusty environments. ➤ Air quality monitoring shall be conducted periodically to ensure compliance with prescribed air quality standards. ➤ Community complaints related to dust shall be recorded, and addressed promptly. 	Contractor	Air quality monitoring reports; Dust suppression log; PPE compliance records	MPWD/PMC/CSC
8	Emissions	The emissions from vehicles and construction equipment will pollute the air causing health and safety issues as well.	<ul style="list-style-type: none"> ➤ Fitness and PUC of the vehicles and equipment's need to be ensured. ➤ LPG shall be used as fuel for cooking of food at construction labour camp instead of fuel wood. ➤ Dust extraction, collection and control systems shall be installed at batching plants, crushers, and material handling areas to minimize particulate 	Contractor	Valid PUC certificates; Equipment maintenance log; Emission test results	MPWD/PMC/CSC

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			emissions.			
9	Contamination of Surface / Ground Water	Discharges from construction activities and construction camps/labour will lead to surface/groundwater pollution.	<ul style="list-style-type: none"> ➤ All the debris resulting from construction activities and labour camp shall be removed from the site and disposed at approved sites away from water bodies, on a regular basis to prevent them from getting into surface runoff. ➤ Adequate sanitation and waste management facility to be provided in construction camp. ➤ Construction labours should be restricted from polluting the water sources or misusing the sources. ➤ Use least amount biodegradable bentonite slurry during piling work. ➤ Contain the Bentonite slurry properly, to not enter waterways or soil and dispose of the slurry appropriately after use. 	Contractor	Water quality monitoring report; Waste disposal records; Camp inspection records. Photographic documentation.	MPWD/PMC/CSC
10	Water requirement for project	Over extraction or exploitation of ground/surface water will lead to water scarcity.	<ul style="list-style-type: none"> ➤ Contractor to ensure optimum and judicious use of water; ➤ Discourage labour from wastage of water and applicable prior approvals shall be obtained from concerned authorities. ➤ Rainwater harvesting structures shall be installed at construction camps and plant sites to promote sustainable use of water. ➤ Awareness programs shall be conducted for laborers and staff on responsible water use and conservation practices. ➤ Records of daily water consumption shall be maintained as part of regular 	Contractor	Water consumption log; Permission for water source; Installation of Rainwater harvesting structure	MPWD/PMC/CSC

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			reporting.			
11	Coffer dam to make dry working space for bridge work	Change in the flow pattern and quality of water, effect on local habitat	<ul style="list-style-type: none"> ➤ Selecting the right location for the cofferdam to minimize its impact on the environment. ➤ Using environmentally friendly materials to construct the cofferdam eg. Biodegradable/ reusable materials can be used instead of concrete. ➤ Restoring the environment after construction. This may involve replanting vegetation and removing any debris. 	Contractor	Worksite inspection record; Restoration completion record	MPWD/PMC/CSC
12	Noise from vehicles, plants and equipment	Noise from construction vehicles, plant and equipment will lead to noise pollution and cause health and safety issues	<ul style="list-style-type: none"> ➤ Construction operations should be undertaken primarily during day time to minimize noise impacts. ➤ Fitness and PUC of the vehicles and equipment's need to be ensured. ➤ No noisy construction activities will be permitted around educational institutions/ health centers (silence zones) and up to 100 m from other sensitive receptors. ➤ Noise level monitoring shall be carried out as per the monitoring schedule. In case there is increase in noise level, preventive measures should be taken to reduce the noise level. ➤ Noise barriers and Hearing Protection devices (earplugs or earmuffs) should be provided 	Contractor	Noise level test report; PPE usage record; Complaint register; vehicles, plants and equipment maintenance records.	MPWD/PMC/CSC
13	Blasting	Unmanaged blasting result in health and safety issues and accidents.	<ul style="list-style-type: none"> ➤ The Contractor will inform well in advance and obtain permission as is required from all Government Authorities, public bodies and private parties; ➤ Blasting will be carried out only with 	Contractor	Approved Blasting management Plan; Blasting permission; Incident log. Geotagged photos.	MPWD/PMC/CSC

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			<p>permission of Engineer-in-charge. All the statutory laws and regulations, rules etc., pertaining to acquisition, transport, storage, handling, and use of explosives will be strictly followed.</p> <p>➤ Blasting management plan shall be developed and should be approved by the concerned authority. The same shall be strictly followed by the contractor.</p>			
14	Loss of trees and Plantation works	Cutting of trees can lead to loss of biodiversity.	<p>➤ Clearing and uprooting should be avoided beyond that which is directly required for construction activities.</p> <p>➤ Kerosene / LPG should be preferably used to avoid felling of the trees or provide community kitchen for the labour camps for cooking.</p> <p>➤ Camps and storage yards shall be located in the areas already devoid of vegetation or having little vegetation</p>	Contractor	Tree felling register; Plantation record;	MPWD/PMC/CSC
15	Terrestrial Flora and Fauna	Construction activities and workers may cause harm to flora and fauna.	<p>➤ All the workers will need to be oriented and monitored by the contractor so as not to cause any harm to the flora and fauna.</p> <p>➤ Hunting and fuel wood collection will be strictly prohibited</p> <p>➤ Speed coming measures, safety signages and Installation of AI-based camera systems (as per RDSO specifications, RDSO/SPN/TC/65/2021).</p>	Contractor	Worker awareness attendance ; Wildlife sighting log	MPWD/PMC/CSC
16	Aquatic Fauna	Construction activities and workers may cause harm to fauna.	➤ Any works affecting aquatic habitat will be done during low flow (when water depth is less than 5 m) and when banks would be dry.	Contractor	Work timing records; Site inspection checklist	MPWD/PMC/CSC

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			<ul style="list-style-type: none"> ➤ Where any GI wire mesh gabions are used; all GI wire ends need to be folded inside. ➤ Ensure that no construction activities will be carried out during monsoon and the fish breeding season. 			
17	Occupational Health and Safety	When Occupational Health and Safety are compromised the associated risks from accidents and incidents could affect health and safety of the workers and others on construction/ project sites. Improper first aid facilities on the sites could affect health and safety of workers and others.	<ul style="list-style-type: none"> ➤ The Contractor would prepare OHS plan and other required plans as per the WBs guidelines. ➤ All the laborers to be engaged for construction works shall be screened for health and adequately treated before issue of work permits. ➤ Periodic health check-up of construction workers. ➤ Prevention of mosquito breeding need to be ensured at the project site and other ancillary areas ➤ The contractor's Environment and Safety personnels, shall ensure implementation of CESMP including Occupational health and safety issues at the camp, construction work sites ➤ Avoiding collection of stagnant water. Adequate drainage, sanitation and waste disposal will be provided at workplaces. ➤ All workers and staff should be provided with Personal Protective Equipment (PPE) appropriate to their job on-site and their use shall be ensured. ➤ All construction sites should be barricaded properly. ➤ Smoking should be prohibited near areas of fire or explosion risk. 	Contractor	Approved OHS plan; OHS training log; PPE checklist; Awareness programme and Health inspection reports	MPWD/PMC/CSC

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			<ul style="list-style-type: none"> ➤ Sufficient supply of potable water should be ensured for all workers and employees on-site. ➤ Ensure a FA room at the camp and first aid kits are available in all work areas. ➤ Safe working techniques will be followed up and all the workers will be trained. ➤ An Emergency Response system in case of any incidence will be developed and implemented. ➤ The Contractor will conduct awareness programmes on EHS, HIV/AIDS and other sexually transmitted diseases for workers at least once in a quarter and the record of such training programme must be recorded. ➤ Conduct regular safety audits on safety measures adopted during construction. 			
18	Community Health and Safety	The safety aspects like (i) safety of road users including pedestrians and cyclists (ii) safety of cattle; (iii) safety of local community (iv) unsafe/ hazardous traffic conditions due to construction vehicle movement need to be considered during the construction stage. Children are most vulnerable to injury due to vehicular accidents.	<ul style="list-style-type: none"> ➤ Plants and equipment will be installed sufficiently away from the settlements. ➤ Proper caution signage, barricading, delineators, lightings etc. will be installed at construction zone and temporary diversions. ➤ Hard barricading will be provided at construction zone near habitation area and public roads, and the same will be maintained throughout the construction period. ➤ Proper traffic management will be ensured near roads of the Construction zone. ➤ Road safety education will be imparted to drivers running 	Contractor	Safety signage installed; Community complaint register; Traffic control records	MPWD/PMC/CSC

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			<p>construction vehicles. In case of negligent driving, suitable action will be taken.</p> <ul style="list-style-type: none"> ➤ Speed restrictions shall be imposed on project vehicles to control speeding. ➤ Installation of temporary speed bumps to control speed near designated pedestrian crossing areas/school areas/ market places/ religious places/ human habitations. ➤ The general public/ residents shall not be allowed to any of the risk areas of the project, e.g., excavation sites, construction sites and areas where heavy equipment is in operation. ➤ In the consideration of risk at civil works, each labour should be covered under ECA 1923 insurance until completion of work. 			
19	Emergency Response system	Absence may result to increased incidents, injury, economic loss etc.	<ul style="list-style-type: none"> ➤ Develop and implement ERS ➤ Train personnel and Establish communication channels ➤ Systematic planning and training for emergencies. 	Contractor	Approved ERP; Emergency drill and training report; Incident response record	MPWD/PMC/CSC
20	Health Management – Communicable Diseases	The water fringe areas provides suitable habitats for the growth of vectors of various diseases, which is likely to increase the incidence of water-borne diseases.	<ul style="list-style-type: none"> ➤ There would be possibility of the transmission of communicable diseases due to migration of labour population from other areas at the construction site. ➤ Agreement shall be made with nearby health centre or hospital for emergency treatment. ➤ Special Measures for COVID 19 should be strictly followed at the camp and construction site. 	Contractor	Health screening record; Awareness session log; Medical report; Agreement with nearby hospital	MPWD/PMC/CSC

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21	Risk of Natural Hazards	The project area is at risk from floods and Earthquakes.	<ul style="list-style-type: none"> ➤ Protection of Agriculture Land near roads/ bridges. ➤ The mitigation measures should be adopted as per norms of State Disaster Management Authority, Government of Meghalaya. 	Contractor	Site assessment report; Record of Compliance with SDMA norms	MPWD/PMC/CSC
22	Risk of Force Majeure Combine with previous	These unforeseen risks can have both adverse environmental and social impacts	<ul style="list-style-type: none"> ➤ All reasonable precaution will be taken to prevent danger of the workers and the public from fire, flood, drowning, etc. ➤ All necessary steps will be taken for prompt first aid treatment of all injuries likely to be sustained during the course of work. ➤ Contractor has to prepare a response plan before start of construction works 	Contractor	Force majeure preparedness plan; Emergency contact list	MPWD/PMC/CSC
23	Hygiene	Impacts related to unhygienic surroundings	<ul style="list-style-type: none"> ➤ At every workplace, good and sufficient water supply shall be maintained to avoid waterborne diseases to ensure the health and hygiene of workers. ➤ Adequate drainage, mobile toilets shall be provided at workplace. ➤ Preventive Medical care shall be provided to workers. ➤ Proper Hygiene shall be maintained 	Contractor	Sanitation inspection record; Hygiene logbook	MPWD/PMC/CSC
24	Traffic Management	Unplanned and unmanaged traffic diversion and detours can result in public nuisance.	<ul style="list-style-type: none"> ➤ Before start of the construction, proper traffic management plan will be prepared and submitted to MPWD for approval. Secure assistance from local police for traffic control during the construction. ➤ Necessary signage and barricading will be provided for safety of road users. ➤ Contractor will ensure that no 	Contractor	Approved TMP; Signage/barricade checklist; Traffic incident register; geotagged photos	MPWD/PMC/CSC

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			<p>construction materials and debris are lying on the road. It will be collected and disposed of properly.</p> <ul style="list-style-type: none"> ➤ Unnecessary parking and sound pollution to be strictly avoided near settlements and sensitive receptor such as schools, hospital and cultural centers. ➤ The contractor will ensure that the diversion/ detour is always maintained in running conditions, particularly during the monsoon to avoid disruption to traffic flow. 			
25	GBV-SEAH Risks	GBV-SEAH risks may arise due to labor influx	<ul style="list-style-type: none"> ➤ Ensure labor camps are away from settlement areas ➤ Ensure that every worker working in the project has been given an orientation on the Worker's Code of Conduct, especially on GBV and SEAH, and has signed the Code of Conduct. ➤ Conduct periodic awareness programs targeted at women laborers and women and children of communities residing close to the work sites for reporting incidents of GBV- SEAH ➤ Ensure complaints of GBV- SEAH are recorded and addressed with urgency. Ensure that name(s) of complainant(s) are kept in confidence and enable anonymous reporting of complaints. ➤ Activate GBV Grievance Redressal Committee immediately on receipt of any GBV- SEAH complaint. Take action on recommendation of the GBV Grievance Redressal Committee within 24 hours of submission of the report. 	Contractor	Signed CoC register; GBV training log; GBV complaint record	MPWD/PMC/CSC

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26	Chance Finds	There is a possibility of Cultural relics, Chance finds at the construction sites. Without proper plan these artefacts may be misused by contractor/workers.	<ul style="list-style-type: none"> ➤ If any cultural remains of geologic or archaeological interest are found, CSC and MPWD shall be immediately informed of such discovery and carry out the instructions for dealing with the same. 	Contractor	Chance find report; Notification records	MPWD/PMC/CSC
27	Compliance to Labour Welfare Laws and reporting	Workplace accidents and injuries, unsafe working condition, loss of productivity etc.	<ul style="list-style-type: none"> ➤ Establish a policy and ensure the compliance within the organization, from the top to the lowest-level employee, understands the importance of complying with labour laws and reporting. ➤ Employees should be trained on their rights and responsibilities under labour laws. ➤ Employees should have a way to report violations of labour laws without fear of retaliation. This could be a hotline, an email address, or a suggestion box. ➤ Investigating and taking action on violations. This could include disciplinary action against the violator, or even legal action. ➤ Employees should be kept updated on the organization's compliance with labour laws. This could be done through regular training sessions, newsletters, or other communication channels. 	Contractor	Labour law compliance record; Training attendance record	MPWD/PMC/CSC
28	Labour Influx	Strain on infrastructure, such as housing, healthcare, and education; social tension, as new arrivals compete with	<ul style="list-style-type: none"> ➤ Proper plan for labour influx by investing in infrastructure and social services. ➤ Governments can regulate the flow of labour to ensure that it is orderly and 	Contractor	Labour License and registration records; Local labour hiring records.	MPWD/PMC/CSC

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		locals for jobs and resources.	<ul style="list-style-type: none"> sustainable. ➤ Local communities can engage with new arrivals to help them understand the local culture and customs. ➤ Maximum use of local labours 			
29	GRM	Increased impunity, conflict and violence; Loss of trust and confidence	<ul style="list-style-type: none"> ➤ Establish a grievance redressal mechanism ➤ Ensure that the mechanism is impartial and independent ➤ Provide adequate support to people who use the mechanism ➤ Communicate effectively with people about the mechanism 	Contractor	GRM register; Grievance resolution records	MPWD/PMC/CSC
30	Monitoring and Reporting (Monthly/Quarterly)	Monitoring environmental attributes like (Air, Water, Noise & soil microbiology) and proper reporting are important for the successful ESMP implementation	<ul style="list-style-type: none"> ➤ The parameters to be monitored, frequency and duration of monitoring as well as the locations to be monitored will be as per Monitoring Plan prepared. ➤ Regular submission of CESMP implementation monitoring report 	Contractor	Monthly/quarterly ESMP compliance report; Monitoring data records	MPWD/PMC/CSC
	Operation Phase					
1	Debris and Waste from Clearing/ Closure of Construction Site, Labor Camps, Disposal Sites, and Borrow Areas	Land and soil contamination due to improper waste disposal; Aesthetic degradation; Health risks to nearby communities	<ul style="list-style-type: none"> ➤ Contractor shall prepare and implement a Site Restoration Plan approved by the Engineer. ➤ On completion of works, all temporary structures, debris, and wastes shall be cleared. ➤ Disposal pits and sanitation trenches shall be filled, compacted, and sealed. ➤ Topsoil removed during construction shall be re-spread to aid vegetation regrowth. ➤ Native grass or trees shall be planted to stabilize restored areas and improve aesthetics. 	Contractor	Site clearance restoration records and closure NOC; Geotagged photos	MPWD
2	Soil Erosion due to	Loss of fertile topsoil;	➤ Regularly inspect slopes and		Reports on Erosion	

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	Runoff over Steep Slopes and Embankments	Siltation of nearby water bodies; Slope instability or road damage	<ul style="list-style-type: none"> embankments for erosion signs. ➤ Implement bioengineering measures like turfing, hydroseeding, and vegetation planting. ➤ Provide stone pitching, retaining walls, or gabions where needed. ➤ Maintain effective drainage systems to reduce concentrated runoff. 	Contractor	inspection; implementation of mitigation measures; Drain maintenance log	MPWD
3	Water Pollution from Road Runoff and Drainage into Water Bodies	Deterioration of surface and groundwater quality; Sediment and oil contamination in nearby streams or waterbodies	<ul style="list-style-type: none"> ➤ Conduct regular water quality monitoring during operation phase. ➤ If pollutants exceed prescribed limits, install silt traps, or sedimentation chambers. ➤ Ensure roadside drains are cleaned and desilted regularly. ➤ Conduct public awareness to discourage waste disposal into water bodies. 	Contractor	Water quality monitoring results; Drain cleaning records	MPWD
4	Dust Generation from Vehicular Movement	Deterioration of ambient air quality; Nuisance to roadside residents and vegetation; Reduced visibility	<ul style="list-style-type: none"> ➤ Establish and maintain roadside plantation to serve as dust barriers. ➤ Maintain smooth road surfaces to minimize dust generation. ➤ Install signage discouraging over-speeding, which increases dust levels. 	Contractor	Air quality results; Plantation survival record	MPWD
5	Air Pollution from Vehicular Emissions	Increased levels of NO _x , SO ₂ , CO, and PM; Health impacts on local population; Deterioration of roadside vegetation	<ul style="list-style-type: none"> ➤ Conduct ambient air quality monitoring at sensitive locations. ➤ Maintain green buffers along the corridor. ➤ Organize awareness campaigns for drivers on emission reduction and vehicle maintenance. 	Contractor	Air quality results; Plantation survival record ; Awareness records	MPWD
6	Noise Pollution from Increased Traffic Movement	Noise nuisance to residents; Disturbance to schools, hospitals, and wildlife	<ul style="list-style-type: none"> ➤ Conduct periodic noise level monitoring. ➤ Provide noise barriers, dense plantation near sensitive receptors. ➤ Enforce "No Horn" zones near schools 	Contractor	Noise monitoring results; Maintenance records	MPWD

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			and hospitals. ➤ Maintain road surface to minimize noise due to uneven pavement.			
7	Road Safety and Accident Risks	Traffic congestion; Increased likelihood of road accidents; Risk to pedestrians and local communities	➤ Install and maintain proper signage, reflectors, and road markings. ➤ Ensure adequate lighting at intersections and pedestrian zones. ➤ Provide speed control measures and pedestrian crossings in settlement areas. ➤ Conduct community road safety awareness programs.	Contractor	Accident record; Safety audit report; Awareness records	MPWD
8	Maintenance Waste from Roadside Maintenance, Drain Cleaning, or Repairs	Soil and water contamination from indiscriminate disposal; Visual pollution and clogging of drains	➤ Collect and dispose of maintenance waste at designated locations. ➤ Prohibit dumping into drainage channels or low-lying areas. ➤ Reuse or recycle suitable materials (e.g., asphalt, concrete, metal).	Contractor	Waste logbook; Disposal records	MPWD

To enhance the capabilities for implementation and monitoring of the Environmental and Social Management Plan (ESMP), it is recommended that structured training programs be conducted for all contractor and project personnel. These trainings will ensure compliance with regulatory requirements, improve awareness, and build competence in managing environmental and social (E&S) risks.

On-Boarding Phase

a. Induction Training

- Mandatory for all personnel before starting work.
- Covers Contractor's Environmental and Social Management Plan (C-ESMP), relevant national and international Environmental, Social, Health, and Safety (ESHS) regulations, and good practices.

b. Specialized Training

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- Tailored training for personnel assigned to specific roles (e.g., environmental officer, safety officer, waste management supervisor).
- Delivered during the mobilization stage to ensure readiness for assigned responsibilities.

Implementation Phase

- **Ongoing Toolbox Talks:**
Conducted daily or weekly to address evolving risks, reinforce safety practices, and maintain continuous awareness among workers.
- **Supplemental Training:**
Provided after incidents or when new risks are identified. Designed to prevent recurrence and ensure the workforce remains updated on new safety/environmental requirements.
- **Routine Quarterly Training:**
- Organized by the contractor every three months to:
 - Review E&S compliance status and progress.
 - Share lessons learned from the previous quarter.
 - Develop action plans to address identified gaps or challenges.
 - Ensure alignment with sub-project E&S objectives and promote continuous improvement.

Table: Given below is the specialized training outline for contractor

Sl. No.	Training Title	Content Summary	Target Group	Purpose	Schedule / Stage
1	Code of Conduct Induction	Sensitization on local issues, introduction to the Code of Conduct, labor camp management	All workers	Ensure awareness of expected behavior, local sensitivities, and compliance with regulations	Onboarding (before deployment)
2	Health, Safety, and Environmental Hygiene	Safety procedures, first aid, environmental hygiene practices	All workers	Reduce occupational hazards and promote safe practices	Onboarding
3	Health and Safety Induction	Special focus on road safety, occupational health, and safety concerns	All workers	Educate on health and safety requirements	Onboarding and as needed
4	Toolbox Sessions	Task-specific safety measures and procedures for work environments	All workers	Reinforce safety protocols and reduce risks	Daily / Weekly
5	Equal Employment	Emphasis on equal employment opportunities and non-discrimination	All workers and management	Ensure ethical and fair employment practices	Onboarding and as needed
6	Social and Cultural Norms of Tribal	Orientation on local cultural practices, traditions, and norms	Workers	Promote respect and awareness of tribal culture	Ongoing / as part of Code of Conduct

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	Communities				
7	SEA/SH Prevention	Awareness on Gender-Based Violence (GBV), Sexual Exploitation, Abuse, Harassment, unsafe migration, and human trafficking	All workers	Prevent and address SEA/SH incidents	Induction / Toolbox Talks / Ongoing
8	HIV/AIDS & STD Awareness	Programs on HIV/AIDS, STDs, and links to SEA/SH risks	All workers and local communities	Promote awareness and prevention of health risks	Ongoing
9	Safe Handling of Hazardous Materials	Safety procedures for handling, storage, and disposal of hazardous substances	Workers involved in hazardous tasks	Ensure safe handling and reduce chemical risks	Onboarding and as needed
10	PPE Usage	Correct selection and use of Personal Protective Equipment (PPE)	All workers	Protect workers from occupational hazards	Onboarding and as needed
11	GRM and SEA/SH Reporting	Mechanisms for grievance redressal and confidential SEA/SH incident reporting	All workers and local communities	Ensure accessible, safe, and effective grievance mechanisms	Ongoing

These training programmes are expected to impart in-depth knowledge from experienced professional working at geographically distant locations.

However, these training programmes are only indicative and can be considered in coordination with the respective institutes in geographically distant areas of the

Indian sub-continent

A. Penalty Clause for Non – Compliance

Penalties for non-compliance of ESMP	
Contractor's Responsibilities: <ul style="list-style-type: none"> • Implement all assigned mitigation measures as per the ESMP and contract documents • Address grievances raised by the public during project implementation • Undertake regular reporting to the CSC/PMC and E&S 	
<ul style="list-style-type: none"> • Any non-compliance in implementing the above responsibilities will attract penalties as detailed in the clause. 	
<ul style="list-style-type: none"> • Major non-compliances <ol style="list-style-type: none"> a) Failure to obtain clearances/ permissions/ NoC/ Registrations/ Consent under statutory environment and labour regulations b) Unaddressed public complaints within the Contractor's scope, formally registered and communicated, within the time period set by CSC/PMC/E&S c) Inadequate safety arrangements or compromising occupational safety/serious hazards posing high risk levels to lives of personnel on site or conditions leading to possible suspension of work until safety is ensured, significant degradation of environment and continuous disturbances in settlements as determined by CSC/PMC/E&S d) Reoccurrence of any minor non-compliances • All non-compliances, which are not major lapses, will be categorized as minor lapses 	

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Penalty for lapses:

- A penalty amount of Rs. 5,000 per day or otherwise fixed by the MPWD for each minor non-compliance with CESMP
- A penalty amount of Rs. 10,000 per day or otherwise fixed by the MPWD for each all-major non-compliance with CESMP. The amount shall be released only if the identified non-compliances are rectified within the duration specified by the MPWD/CSC/PMC. Duration specified shall consider the environmental and social damage/risks associated with non-compliances. Such specified duration shall not be more than 15 days.
- Reoccurrence of the minor non compliances shall be treated as major lapses • Reoccurrence of all major non compliances, a penalty of Rs. 50,000 shall be levied for each such non - compliance.

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Annexure 4.1: Biodiversity Methodology (A Comprehensive Sampling Design and Indicators)

SECONDARY/DESKTOP DATA COLLECTION

1. Secondary data collection complemented primary field efforts by providing historical and contextual insights into the biodiversity of **South West Garo Hills**. The approach included:
2. Literature Reviews and Consultations:
 - a. Reviewed peer-reviewed articles, biodiversity reports, and government publications relevant to the region.
 - b. Consulted databases such as the IUCN Red List, ZSI records, and previous Environmental Impact Assessments (EIAs) conducted in nearby areas.
3. Use of Historical Biodiversity Records:
 - a. Incorporated species data from earlier surveys and studies conducted in **South West Garo Hills**.
 - b. Verified and updated records based on field observations to ensure data accuracy.
4. Subsequently, comprehensive tools such as IBAT-Alliance, Web-Based Sources and the following list (Below Table) of sources are used for the secondary data collection.

Table 1: Tools/Sources for identifying critical habitats

SI No.	Indicators	Tools	References
1	Natural Habitat/ Modified Habitat	Global Forest Watch Land Cover Layer	https://www.globalforestwatch.org/
2	Land Use Land Cover	Land Cover data by ESRI and Impact Observatory	Environmental Systems Research Institute, California
3	PAs, Conservation Reserve, Community Reserve, Reserve Forest & Eco-sensitive Zone	Parivesh portal	https://stgdev.parivesh.nic.in/kya-dev/#/
4	Tiger Reserve & Corridor	Download boundary file and overlay the project area	https://ntca.gov.in/dss/#decision-support-system
5	Protected Wetland of Meghalaya	State Notification (2023)	Wetlands (Conservation and Management) Rules, 2017
6	Ramsar Site	Ramsar Sites Information Services	https://rsis Ramsar.org/
7	Key Biodiversity Area/Important Bird Area	Key Biodiversity Area	https://www.keybiodiversityareas.org/sites/search
8	Schedule Species (I-IV), Wildlife (Protection) Act, 1972	List of schedule species list (I - IV)	Wild Life (Protection) Amendment Act, 2022

Primary data collection:

5. Primary data collection involved direct fieldwork is conducted between August 2025 to September 2025 to assess the biodiversity of the direct impact area of the project road. Key activities and followed

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methods included in the below Table.

Table 2: Primary data collections methods and indicators

Sl. No.	Biodiversity survey	Methods	Indicators
1	Vegetation	Nested quadrat method	Species richness, density, diversity indices and dominance
2	Mammal (diurnal and nocturnal)	Visual encounter and sign surveys using line transect method	Species richness and diversity and encounter rate
3	Avifauna	Line transects	Species richness and diversity and encounter rate
4	Reptiles and amphibians	Visual encounter (transect survey)	Species richness and diversity and encounter rate
5	Butterfly	Transect survey	Species richness and diversity and encounter rate
6	Aquatic fauna	Transect/Netting survey/Rod-line methods	Species richness and diversity and encounter rate

Meetings with Local government officials:

6. Various interactions and meetings were conducted with, Environmental expert of MPWD & other officials of MPWD responsible for the project road. Meetings with forest department officials were done to request information about their working plan circles and their management of protected areas and to discuss about animal corridors if present in the vicinity of the project road.

7. Additionally, discussions were held with inhabitants near the project site, engaging various individuals to understand the current status of fauna along the road and nearby protected areas. The conversations focused on gathering information about the presence of wildlife, the frequency of sightings along the roadside, and in nearby community forests.

8. Data Analysis Methods

Collected data was analyzed using the following methods:

Species Categorization:

- Species were classified based on their taxonomic groups for Flora (Trees, Herbs, shrubs, Climbers and Grasses and Fauna (mammals, birds, amphibians, reptiles, etc.).
- Conservation statuses were assigned using IUCN Red List categories and Wildlife Protection Act (WPA) schedules.

Threat Assessment:

- Identified species at risk due to habitat fragmentation, road construction, and human disturbances.
- Assessed habitat quality and connectivity using geographic data and field observations.

Habitat Mapping:

- Mapped key biodiversity hotspots and critical habitats along the proposed road alignment.
- Spatial data mapping- Ecological sensitive areas - proximity to respected PAs has been identified based on GIS SHP files obtained from forest/MPWD department, topo sheets and satellite imagery

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Annexure 4.2: Detailed List Of Flora, Fauna, And Aquatic Biodiversity, Along With Their Conservation Status

During the survey, the team has also given emphasis to the presence of different species within the 10 km Buffer area of the project site through interview, field visit and literature review. The tree species common to the project site includes – *Teak*, *Ficus*, *Arjuna tree*, *Bamboo*, *Areca nut*, *Ber*, *Guava*, *Banana* etc.

List of trees: (Source : Primary and Secondary data)

Sl. No.	Common Name	Scientific Name	IUCN Status	Family
1	Ficus recemosa	<i>Ficus recemosa</i>	NL	Moraceae
2	Hovenia dulcis	<i>Hovenia dulcis</i>	LC	Rhamnaceae
3	Leucaena	<i>Leucaena leucocephala</i>	NL	Fabaceae
4	Acacia-tree	<i>Acacia auriculiformis</i>	LC	Fabaceae
5	Amla	<i>Phyllanthus emblica</i>	LC	Phyllanthaceae
6	Amoora	<i>Aglaia spectabilis</i>	LC	Meliaceae
7	Areca palm	<i>Areca catechu</i>	LC (Decreasing)	Arecaceae
8	Arjun tree	<i>Terminalia arjuna</i>	NL	Combretaceae
9	Baheda	<i>Terminalia bellirica</i>	LC	Combretaceae
10	Bamboo	<i>Melocanna baccifera</i>	NL	Poaceae
11	Banana	<i>Musa balbisiana</i>	LC	Musaceae
12	Bando lata	<i>Spatholobus parviflorus</i>	LC	Fabaceae
13	Bhelu	<i>Tetrameles nudiflora</i>	LC	Tetramelaceae
14	Black catechu	<i>Senegalia catechu</i>	LC	Fabaceae
15	Black Plum	<i>Syzygium cumini</i>	LC	Myrtaceae
16	Black Siris	<i>Albizia odoratissima</i>	LC	Fabaceae
17	Bonsum	<i>Phoebe goalparensis</i>	NL	Lauraceae
18	Burflower-tree	<i>Neolamarckia cadamba</i>	LC	Rubiaceae
19	Chamkathal	<i>Artocarpus chaplasha</i>	LC	Moraceae
20	Cashew	<i>Anacardium occidentale</i>	LC	Anacardiaceae
21	China berry	<i>Melia azedarach</i>	LC	Meliaceae
22	Chorai	<i>Vitex peduncularis</i>	LC	Lamiaceae
23	Cluster fig tree	<i>Ficus racemosa</i>	NL	Moraceae
24	Coconut palm	<i>Cocos nucifera</i>	NL	Arecaceae
25	Common jujube	<i>Ziziphus jujuba</i>	LC	Rhamnaceae
26	Cotton tree	<i>Bombax ceiba</i>	LC	Malvaceae
27	Dog Teak	<i>Dillenia pentagyna</i>	LC	Dilleniaceae
28	Dotted fig	<i>Ficus geniculata</i>	NL	Moraceae
29	Drumstick tree	<i>Moringa oleifera</i>	LC	Moringaceae
30	Dulloo bamboo	<i>Schizostachyum dullooa</i>	NL	Poaceae
31	East Himalayan Dalbergia	<i>Dalbergia stipulacea</i>	LC	Fabaceae
32	Elephant rope tree	<i>Sterculia villosa</i>	LC	Malvaceae
33	False ashoka tree	<i>Polyalthia longifolia</i>	LC	Annonaceae

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Sl. No.	Common Name	Scientific Name	IUCN Status	Family
34	Forest red gum	<i>Eucalyptus tereticornis</i>	LC	Myrtaceae
35	Gamhar	<i>Gmelina arborea</i>	LC	Lamiaceae
36	Ghora neem	<i>Melia azedarach</i>	LC	Meliaceae
37	Golden shower	<i>Cassia fistula</i>	LC	Fabaceae
38	Guava	<i>Psidium guajava</i>	LC	Myrtaceae
39	Gulmohor	<i>Delonix regia</i>	LC	Fabaceae
40	Hairy fig	<i>Ficus hispida</i>	NL	Moraceae
41	Hibiscus	<i>Hibiscus rosa-sinensis</i>	LC	Malvaceae
42	Hog Creeper	<i>Deguelia scandens</i>	LC	Fabaceae
43	Indian ash tree	<i>Lannea coromandelica</i>	LC	Anacardiaceae
44	Indian Bael tree	<i>Aegle marmelos</i>	NT	Rutaceae
45	Indian gooseberry	<i>Phyllanthus emblica</i>	LC	Phyllanthaceae
46	Indian mahogany	<i>Cedrela toona</i>	LC	Meliaceae
47	Indian sandalwood	<i>Santalum album</i>	VU	Santalaceae
48	Indian trumpet flower	<i>Oroxylum indicum</i>	LC	Bignoniaceae
49	Jackfruit	<i>Artocarpus heterophyllus</i>	NL	Moraceae
50	Kassod	<i>Senna siamea</i>	LC	Fabaceae
51	Khasi pine	<i>Pinus kesiya</i>	LC	Pinaceae
52	Lychee	<i>Litchi chinensis</i>	VU	Sapindaceae
53	Mango	<i>Mangifera indica</i>	DD	Anacardiaceae
54	Mohaneem	<i>Azadirachta indica</i>	LC	Meliaceae
55	Night-blooming jasmine	<i>Nyctanthes arbor-tristis</i>	LC (Stable)	Oleaceae
56	Orchid tree	<i>Bauhinia tomentosa</i>	LC	Fabaceae
57	Peepal tree	<i>Ficus religiosa</i>	LC	Moraceae
58	Pongam Tree	<i>Pongamia pinnata</i>	LC (Stable)	Fabaceae
59	Teak	<i>Tectona grandis</i>	EN	Lamiaceae
60	Tamarind tree	<i>Tamarindus indica</i>	LC (Stable)	Fabaceae
61	Tree bean	<i>Parkia timoriana</i>	LC	Fabaceae
62	Wild guava	<i>Careya arborea</i>	LC	Lecythidaceae
62	Woolly Rosebay	<i>Wrightia arborea</i>	LC	Apocynaceae

Species observed during Primary Survey are highlighted with Blue colour

List of Shrubs (Source: Primary and Secondary data)

Sl. No.	Common Name	Scientific Name	IUCN Status	Family
1.	Bogang	<i>Clerodendrum buchananii</i>	Not Listed	Lamiaceae
2.	Orange Chinese hat plant	<i>Holmskioldia sanguinea</i>	Not Listed	Lamiaceae
3.	Siam Weed	<i>Eupatorium odoratum</i>	Not Listed	Asteraceae
4.	Lantana	<i>Lantana camara</i> L.	Not Listed (Invasive)	Verbenaceae
5.	Wild Nongmangkha	<i>Phlogacanthus curviflorus</i>	Not Listed	Acanthaceae
6.	Ronga bahak	<i>Phlogacanthus thyrsoformis</i>	Not Listed	Acanthaceae

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Sl. No.	Common Name	Scientific Name	IUCN Status	Family
7.	Castor bean	<i>Ricinus communis</i> L.	LC	Euphorbiaceae
8.	Indian Snakeweed	<i>Stachytarpheta indica</i> (L.) Va	Not Listed	Verbenaceae

Species observed during Primary Survey are highlighted with Blue colour

List of Herb: (Source : Primary and Secondary data)

Sl. No.	Common Name	Scientific Name	IUCN Status	Family
1.	Fringed Pod Toothache Plant	<i>Acmella</i> (Kunth)	NL	Asteraceae
2.	Marsh para cress	<i>Acmella uliginosa</i>	NL	Asteraceae
3.	Sticky snakeroot	<i>Ageratina adenophora</i>	NL (Invasive)	Asteraceae
4.	Chick weed	<i>Ageratum conyzoides</i> L.	NL (Invasive)	Asteraceae
5.	Bluemink	<i>Ageratum houstonianum</i>	NL	Asteraceae
6.	Alligator weed	<i>Alternanthera philoxeroides</i>	NL (Invasive)	Amaranthaceae
7.	Pineapple	<i>Ananas comosus</i> (L.)	LC	Bromeliaceae
8.	Beggar Tick	<i>Bidens pilosa</i> L.	LC	Asteraceae
9.	Feather celosia	<i>Celosia argentea</i> L.	LC	Amaranthaceae
10.	Siam weed	<i>Chromolaena odorata</i> (L.)	NL (Invasive)	Asteraceae
11.	Redflower ragleaf	<i>Crassocephalum crepidioides</i> (Benth.)	NL	Asteraceae
12.	Gallant soldier	<i>Galinsoga parviflora</i>	LC	Asteraceae
13.	Fringed quickweed	<i>Galinsoga quadriradiata</i>	NL	Asteraceae
14.	Pennsylvania cudweed	<i>Gamochaeta pensylvanica</i>	LC	Asteraceae
15.	Jom lakhut	<i>Hellenia speciosa</i>	LC	Costaceae
16.	Cogon grass	<i>Imperata cylindrica</i>	LC	Poaceae
17.	Durun bon	<i>Leucas aspera</i>	LC	Lamiaceae
18.	Sensitive plant	<i>Mimosa pudica</i> L.	NL	Fabaceae
19.	Congress grass	<i>Parthenium hysterophorus</i> L.	NL (Invasive)	Asteraceae
20.	Stinking cassia	<i>Senna tora</i>	LC	Fabaceae
21.	Asian broom grass	<i>Thysanolaena latifolia</i>	LC	Poaceae

Species observed during Primary Survey are highlighted with Blue colour

List of Fern (Source: Primary and Secondary data)

Sl. No.	Common Name	Scientific Name	IUCN Status	Family
1.	Walking maidenhair fern	<i>Adiantum philippense</i>	NL	Pteridaceae
2.	Tree fern	<i>Alsophila latebrosa</i> .	NL	Cyatheaceae
3.	Bird's nest fern	<i>Asplenium nidus</i> L.	LC	Aspleniaceae
4.	Creeping Fern	<i>Bolbitis heteroclita</i>	NL	Dryopteridaceae
5.	Ardisia	<i>Ardisia solanacea</i>	LC	Primulaceae
6.	Indigo Plant	<i>Strobilanthes cusia</i>	LC	Athyriaceae
7.	Dhekia	<i>Diplazium esculentum</i>	NL	Athyriaceae
8.	Lace fern	<i>Odontosoria chinensis</i>	NL	Lindsaeaceae
9.	Giant Vine Fern	<i>Stenochlaena tenuifolia</i>	NL	Blechnaceae

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Sl. No.	Common Name	Scientific Name	IUCN Status	Family
10.	Downy maiden fern	<i>Thelypteris dentata</i>	NL	Thelypteridaceae

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List of Grass species (Source : Primary and Secondary data)

Sl. No.	Common Name	Scientific Name	IUCN Status	Family
1.	Bermuda Grass / Durva	<i>Cynodon dactylon</i>	Least Concern (LC)	Poaceae
2.	Giant reed	<i>Arundo donax</i> L.	NL (Invasive)	Poaceae
3.	Mint / Pudina	<i>Mentha arvensis</i>	Least Concern (LC)	Lamiaceae
4.	Wild Ginger	<i>Zingiber zerumbet</i>	Least Concern (LC)	Zingiberaceae
5.	Turmeric / Haldi	<i>Curcuma longa</i>	Data Deficient (DD) in IUCN; widely cultivated	Zingiberaceae
6.	Gotu kola / Indian Pennywort	<i>Centella asiatica</i>	Least Concern (LC)	Apiaceae
7.	Broom Grass / Tiger Grass	<i>Thysanolaena maxima</i>	Least Concern (LC)	Poaceae

Species observed during Primary Survey are highlighted with Blue colour

List of Fauna:

List of Bird Species (Source : Primary and Secondary data)

Common Name	Scientific Name	IUCN Status	WPA 1972 Schedule	Migration / Resident Status
Black Drongo	<i>Dicrurus macrocercus</i>	Least Concern	IV	R
Blue-throated Barbet	<i>Psilopogon asiaticus</i>	Least Concern	IV	R
Common Myna	<i>Acridotheres tristis</i>	Least Concern	IV	R
Common Tailorbird	<i>Orthotomus sutorius</i>	Least Concern	IV	R
Emerald Dove	<i>Chalcophaps indica</i>	Least Concern	IV	R
Great Barbet	<i>Psilopogon virens</i>	Least Concern	IV	R
House Sparrow	<i>Passer domesticus</i>	Least Concern	IV	R
Indian Pond Heron	<i>Ardeola grayii</i>	Least Concern	IV	R
Jungle Myna	<i>Acridotheres fuscus</i>	Least Concern	IV	R
Red-vented Bulbul	<i>Pycnonotus cafer</i>	Least Concern	IV	R
Shikra	<i>Accipiter badius</i>	Least Concern	IV	R
Spotted Dove	<i>Spilopelia chinensis</i>	Least Concern	IV	R
White-throated Kingfisher	<i>Halcyon smyrnensis</i>	Least Concern	IV	R
Oriental White-eye	<i>Zosterops palpebrosus</i>	Least Concern	IV	R
Asian Koel	<i>Eudynamis scolopaceus</i>	Least Concern	IV	R
Common Hoopoe	<i>Upupa epops</i>	Least Concern	IV	WM

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Rufous Woodpecker	<i>Micropternus brachyurus</i>	Least Concern	IV	R
Common Iora	<i>Aegithina tiphia</i>	Least Concern	IV	R
Scarlet Minivet	<i>Pericrocotus flammeus</i>	Least Concern	IV	R
Bronzed Drongo	<i>Dicrurus aeneus</i>	Least Concern	IV	R
Black-hooded Oriole	<i>Oriolus xanthornus</i>	Least Concern	IV	R
Rufous Treepie	<i>Dendrocitta vagabunda</i>	Least Concern	IV	R
Barn Swallow	<i>Hirundo rustica</i>	Least Concern	IV	WM
Asian Pied Starling	<i>Gracupica contra</i>	Least Concern	IV	R
Paddy Field Pipit	<i>Anthus rufulus</i>	Least Concern	IV	R
Oriental Turtle Dove	<i>Streptopelia orientalis</i>	Least Concern	IV	R
Red-collared Dove	<i>Streptopelia tranquebarica</i>	Least Concern	IV	R
Green Bee-eater	<i>Merops orientalis</i>	Least Concern	IV	R
White Wagtail	<i>Motacilla alba</i>	Least Concern	IV	WM
Grey Wagtail	<i>Motacilla cinerea</i>	Least Concern	IV	WM
Citrine Wagtail	<i>Motacilla citreola</i>	Least Concern	IV	WM
Common Stonechat	<i>Saxicola torquatus</i>	Least Concern	IV	R
Crimson Sunbird	<i>Aethopyga siparaja</i>	Least Concern	IV	R
Purple Sunbird	<i>Cinnyris asiaticus</i>	Least Concern	IV	R
Jungle Owlet	<i>Glaucidium radiatum</i>	Least Concern	IV	R
Jungle Babbler	<i>Turdoides striata</i>	Least Concern	IV	R
Greater Necklaced Laughing Thrush	<i>Garrulax pectoralis</i>	Least Concern	IV	R
Black-throated Sunbird	<i>Aethopyga saturata</i>	Least Concern	IV	R
Green-tailed Sunbird	<i>Aethopyga nipalensis</i>	Least Concern	IV	R
Purple-rumped Sunbird	<i>Leptocoma zeylonica</i>	Least Concern	IV	R
Ruby-cheeked Sunbird	<i>Chalcoparia singalensis</i>	Least Concern	IV	R
Scarlet-backed Flowerpecker	<i>Dicaeum cruentatum</i>	Least Concern	IV	R
Plain Prinia	<i>Prinia inornata</i>	Least Concern	IV	R
Red-headed Vulture	<i>Sarcogyps calvus</i>	Critically Endangered	I	R
White-rumped Vulture	<i>Gyps bengalensis</i>	Critically Endangered	I	R

- R = Resident

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- WM = Winter Migrant
- SV = Seasonal Visitor

Species observed during Primary Survey are highlighted with Blue colour

List of Mammals, Reptiles (Source : Primary and Secondary data)

Sl. No.	Name	Scientific name	IUCN status	Schedule status (WPA 2022)
Mammals				
1.	Rehsum Macaque	<i>Macaca mulata</i>	LC	NS
2.	Boro endur	<i>Cannomys badius</i>	LC	NS
3.	Large Indian Civet	<i>Viverra zibetha</i>	LC	II
4.	Masked Palm Civet	<i>Paguma larvata</i>	LC	II
5.	Irrawaddy Squirrel	<i>Callosciurus pygerythrus</i>	LC	NS
6.	Western Hoolock Gibbon	<i>Hoolock hoolock</i>	EN	I
7.	Chinese Pangolin	<i>Manis pentadactyla</i>	EN	I
8.	Bengal Slow Loris	<i>Nycticebus bengalensis</i>	EN	I
Reptiles				
1.	Common Garden Lizard	<i>Calotes versicolor</i>	NE	NS
2.	Bronze Skink	<i>Eutropis macularia</i>	LC	NS
3.	White-spotted Supple Skink	<i>Lygosoma albopunctata</i>	LC	NS
4.	Banded Krait	<i>Bungarus fasciatus</i>	LC	NS
5.	Common Kukri Snake	<i>Oligodon arnensis</i>	LC	NS
6.	Snail-eater	<i>Pareas monticola</i>	LC	NS
Amphibians				
1.	Indian Bullfrog	<i>Hoplobatrachus tigerinus</i>	LC	II
2.	Baibung Small Treefrog	<i>Theloderma baibungense</i>	LC	NS
Butterflies				
1.	Teinopalpus imperialis	<i>Byasa dasarada</i>	NT	NS
2.	Bhutanitis lidderdalii	<i>Graphium aggamemnon</i>	LC	NS
3.	Troides helena	<i>Delias descombesi</i>	LC	NS
4.	Papilio bianor	<i>Hypolimnias bolina</i>	LC	NS
5.	Papilio paris	<i>Moduza procris</i>	LC	NS
6.	Papilio memnon	<i>Charaxes bharata</i>	LC	NS
7.	Papilio polytes	<i>Graphium cloanthus</i>	LC	NS
8.	Papilio clytia	<i>Kallima inachus</i>	LC	NS
9.	Graphium sarpedon	<i>Papilio polytes</i>	LC	NS
10.	Graphium doson	<i>Junonia almana</i>	LC	NS
11.	Graphium agamemnon	<i>Junonia iphita</i>	LC	NS
12.	Atrophaneura varuna	<i>Acraea issoria</i>	LC	NS
13.	Lamproptera curius	<i>Troides helena</i>	LC	NS
14.	Pachliopta aristolochiae	<i>Pachliopta aristolochiae</i>	LC	NS

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Sl. No.	Name	Scientific name	IUCN status	Schedule status (WPA 2022)
15.	Kallima inachus	<i>Papilio eurypylus</i>	LC	NS
16.	Hypolimnas bolina	<i>Elymnias patna</i>	LC	NS
17.	Elymnias hypermnestra	<i>Cyrestis thyodamas</i>	LC	NS
18.	Junonia atlites	<i>Troides aeacus</i>	LC	NS
19.	Junonia lemonias	<i>Papilio helenus</i>	LC	NS
20.	Danaus chrysippus	<i>Graphium macareus</i>	LC	NS
21.	Tirumala limniace	<i>Danaus chrysippus</i>	LC	NS
22.	Parantica aglea	<i>Graphium doson</i>	LC	NS
23.	Euploea core	<i>Junonia orithya</i>	LC	NS
24.	Neptis hylas	<i>Prosotas nora</i>	LC	NS
25.	Ypthima baldus	<i>Heliophorus epicles</i>	LC	NS

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Aquatic Biodiversity**List of Fish**

Order	Scientific Name	Common Name	Local Name	IUCN Status	Habitat Type
Cypriniformes	<i>Puntius sophore</i>	Pool Barb	Na Patchi / Puti	LC	Rivers, floodplains, ponds
Cypriniformes	<i>Puntius chola</i>	Barb	Na Patchi / Puti	LC	Rivers, floodplains
Cypriniformes	<i>Gudusia chapra</i>	Indian River Shad	Na Patchi / Puti	LC	Rivers, reservoirs
Cypriniformes	<i>Raiamas bola</i>	Trout Barb	–	LC	Clear hill streams
Cypriniformes	<i>Labeo rohita</i>	Rohu	Khabaw	LC	Rivers, ponds, floodplains
Cypriniformes	<i>Catla catla</i>	Catla	–	LC	Rivers, reservoirs
Other Cypriniformes	<i>Cyprinus carpio</i>	Common Carp	–	VU	Lakes, still waters, reservoirs
Perciformes	<i>Channa stewartii</i>	Snakehead	Na Chi	LC	Streams, ponds, slow waters
Nemacheilidae	<i>Aborichthys garoensis</i>	Garo Stone Loach	–	VU	Hill streams, bottoms in Garo Hills
Synbranchidae	<i>Garo khajuriai</i>	Garo Spineless Eel	–	NT	Freshwater demersal, hill streams / bottoms

(Source: Primary and Secondary data)

List of Phytoplanktons

Class	Genus / Species Found
Bacillariophyceae (Diatoms)	<i>Frustulia</i> sp., <i>Gyrosigma</i> sp., <i>Navicula</i> sp., <i>Tabellaria</i> sp., <i>Gomphonema</i> sp., <i>Fragilaria</i> sp., <i>Diatoma</i> sp., <i>Synedra</i> sp., <i>Pinnularia</i> sp.
Chlorophyceae (Green algae)	<i>Staurostrum rotundum</i> , <i>Staurostrum leptocladium</i> , <i>Cosmarium decoratum</i> , <i>Cosmarium reniforme</i> , <i>Cosmarium leibleinii</i> , <i>Draparnaldiopsis</i> sp., <i>Hyalotheca</i> sp., <i>Spirogyra</i> sp., <i>Gonatozygon</i>

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	<i>sp., Ulothrix sp., Eudorina sp.</i>
Cyanophyceae / Cyanobacteria	<i>Anabaena sp., Oscillatoria sp., Microcystis aeruginosa, Nostoc sp.</i>
Desmidiaceae (Green algae)	<i>Closterium sp., Pirulina sp.</i>
Chrysophyceae (Golden-brown algae)	<i>Dinobryon sociale</i>
Dinophyceae (Dinoflagellates)	<i>Ceratium sp., Glenodinium sp., Ceratium hirudinella</i>

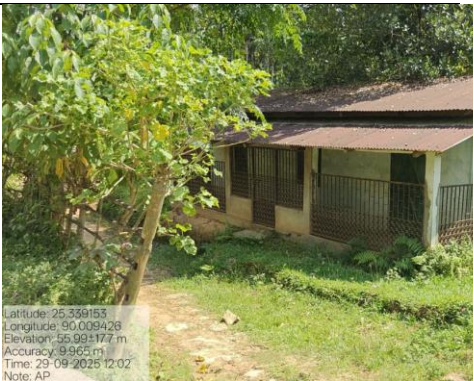
Secondary source reference: Working Plan of South West Garo Hills Tura Division

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Annexure 4.3: Structure Details**TABLE 1: LIST OF STRUCTURES**

S+ No+	LHS/RHS	Chainage and distance	Distance from centre line	Type of Impact	Photo
1.	RHS	19+450	5.3	Temporary shop	 <p>Latitude: 25.369242 Longitude: 90.000818 Altitude: 51.77134.2 m Accuracy: 8.092 m Time: 29-09-2025 11:41 Note: AP</p>
2.	LHS	19+450	5.2	Bamboo fencing of house	 <p>Latitude: 25.362289 Longitude: 90.010033 Elevation: 117.2343.94 m Accuracy: 5.564 m Time: 29-09-2025 11:47 Note: AP</p>
3.	LHS	23+100	5.4	Bamboo fencing of house	 <p>Latitude: 25.340451 Longitude: 90.010029 Elevation: 51.5519.54 m Accuracy: 7.697 m Time: 29-09-2025 11:56 Note: AP</p>
4.	LHS	23+200	5.2	House and Community Hall	 <p>Latitude: 25.311549 Longitude: 90.006586 Elevation: 52.35412.3 m Accuracy: 9.591 m Time: 29-09-2025 12:27 Note: AP</p>

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5.	RHS	26+950	5.8	Temporary Shop	 <p> Latitude: 25.336153 Longitude: 80.609428 Elevation: 55.981177 m Accuracy: 9.965 m Time: 29-09-2025 12:02 Note: AP </p>
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Annexure 5.1: Dumpsite Stabilization Plan

1. Introduction

The MLCIP road project involves widening, cutting, slope trimming, excavation for retaining walls, and construction of culverts/bridges. These activities will generate excavated soil, rock fragments, and construction spoils (collectively referred to as muck). Proper muck management is crucial in Meghalaya due to steep terrain, fragile geology, and high rainfall that increase erosion and landslide risks.

2. Quantity & Sources of Muck

Excavation will mainly occur along road cuttings, drainage works, and foundations for retaining/breast walls. The proposed road construction activity will involve the total fill quantity is 29111.61m³, and the cut quantity is 1234426.3 m³. After balancing cut and fill requirements, there remains a surplus of approximately 1205314.69 m³ of excavated material.

3. Criteria for Muck Disposal Site Selection

The following criteria shall guide the selection of muck disposal sites:

- **Proximity to Work Sites** – Disposal sites should be located within 2–3 km of the excavation area to minimize fuel consumption, traffic congestion, and road safety risks from muck transport.
- **Slope Stability** – Sites shall be located on naturally stable and gently sloping terrain (preferably <25°) and away from landslide-prone or erosion-prone areas.
- **Distance from Water Sources** – A minimum buffer of 50 m from streams/drains and 100 m from rivers/lakes shall be maintained to prevent siltation and contamination.
- **Avoidance of Habitation & Agriculture** – Disposal shall not be carried out near settlements, schools, or agricultural land to avoid livelihood and health impacts.
- **Non-Forest/Non-Encroachment Land** – Sites should preferably be on barren, community, or government land, avoiding forest land unless prior approval is obtained.
- **Approval & Community Consent** – All disposal sites must be approved by the Village Employment Council (VEC) / traditional institutions under KHADC/JHADC/GHADC, and endorsed by the State MPWD/PIU.
- **Accessibility & Safety** – Sites should be accessible by haul roads without requiring major additional cutting, and safe for vehicle maneuvering.

The details for the muck disposal sites are presented in Table below:

Table: Details for the Muck disposal site

Dumping Location			Coordinate		Area m ²
SL. NO	LOCATION CHAINAGE	SIDE	X	Y	
1	19+850	LHS	199059.03	2808346.15	3500

4. Methodology of Muck Disposal

Utilization priority: Maximum use of excavated material in road embankment, shoulder filling, and construction of retaining/breast walls.

Disposal management include:

- Dumping muck in designated sites at slope $\leq 30^\circ$.
- Layer-wise compaction using machinery.
- Retaining walls or gabion walls constructed at toe of disposal sites.

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- Drainage channels with weep holes for safe water passage.
- Temporary fencing to prevent spillage and encroachment.

5. Rehabilitation of Muck Disposal Sites

- Engineering Measures

- Construction of breast walls/retaining walls.
- Compaction of dumped muck in layers (500–700 mm).
- Surface levelling and provision of drainage.

- Biological Measures

- Covering muck with topsoil.
 - Plantation of native species
- Bamboo crib wall
- Turfing of slopes to minimize erosion.
 - Community-based maintenance through Village Employment Councils/ Self-Help Groups.

6. Monitoring & Compliance

Regular monitoring will be conducted by PIU/PMC to ensure muck disposal is done only at designated sites. Compliance will be ensured with Meghalaya State Pollution Control Board (MSPCB) and MoRTH/IRC environmental guidelines. Geo-tagging of muck disposal sites under MLCIP will also be carried out.

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Annexure 5.2: Labour Management Plan (LMP)

For

Meghalaya Logistics and Infrastructure Connectivity Project (MLICP)

1. Introduction:

The Labour Management Plan (LMP) outlines the framework for managing labour-related issues in the Meghalaya Logistics and Infrastructure Connectivity Project (MLICP). The objective is to ensure compliance with applicable national labour laws, safeguard worker rights, prevent exploitation, and promote safe, fair, and equitable working conditions. The plan applies to direct workers, contracted workers, community workers, and primary supply workers engaged under the project.

2. Objectives:

- Ensure fair treatment, non-discrimination, and equal opportunity for all workers.
- Protect workers' rights as per Indian legislations and international standards (World Bank ESS2).
- Provide safe and healthy working conditions.
- Prevent the use of child labour and forced labour.
- Establish a functional grievance redressal mechanism (GRM) for workers.
- Strengthen capacity of contractors and sub-contractors for compliance.

3. Applicable Legal Framework:

The project will comply with the following labour laws:

1. Payment of Wages Act, 1936 – timely and fair wage payment.
2. Minimum Wages Act, 1948 – ensure minimum wages for construction workers.
3. Equal Remuneration Act, 1976 – equal wages and non-discrimination.
4. Contract Labour (Regulation & Abolition) Act, 1970 – registration, welfare measures, and licensing for contractors.
5. Payment of Gratuity Act, 1972 – terminal benefits after minimum service.
6. Employees' Provident Fund & Miscellaneous Provisions Act, 1952 – PF contributions and benefits.
7. Payment of Bonus Act, 1965 – bonus to eligible workers.
8. Maternity Benefit Act, 1961 – leave and benefits for women employees.
9. Child Labour (Prohibition & Regulation) Act, 1986 – prohibition of child labour below 14 years.
10. Inter-State Migrant Workmen (Regulation of Employment & Conditions of Service) Act, 1979 – facilities for migrant workers.

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11. Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 – welfare, safety, health, and cess collection.

4. Labour Use in the Project:

The project will engage different categories of labour:

- Direct Workers: Staff hired by the Project Implementing Unit (PIU), PMU, and consultants.
- Contracted Workers: Workers engaged by civil works contractors and sub-contractors.
- Primary Supply Workers: Labour involved in material supply (stone, sand, cement, bitumen, etc.).
- Community Workers (if applicable): Local villagers engaged in small-scale work or maintenance.

5. Labour Influx and Local Norms:

- Most labour will be drawn from local communities.
- Limited skilled/semi-skilled labour may migrate from outside Meghalaya.
- Contractors must ensure registration of inter-state migrant workers as per law.
- Customary land and village institutions (Dorbar Shnong, Nokma, Dolloi, Syiem, etc.) will be consulted to ensure harmony with local governance and community values.

6. Key Labour Risks:

- Influx of outside labour creating pressure on local resources.
- Occupational Health and Safety (OHS) risks due to construction activities.
- Risk of child labour or bonded labour.
- Gender-based violence (GBV), sexual exploitation, and harassment (SEAH).
- Wage disputes and delayed payments.
- Lack of access to grievance redressal for contract workers.

7. Labour Management Procedures:

7.1 Recruitment and Employment:

- Priority to local labour as per community norms.
- Transparent recruitment through contractors, avoiding middlemen.
- Maintain worker registers with demographic and employment details.
- Written contracts/appointment letters for all workers.

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7.2 Wages and Benefits:

- Payment of wages electronically/bank transfer wherever feasible.
- Equal pay for equal work for men and women.
- Wage slips issued monthly.
- Contribution to PF/ESI as per eligibility.

7.3 Working Conditions and Hours:

- Working hours not to exceed 8 hours/day and 48 hours/week.
- Weekly rest, overtime payment as per law.
- Rest shelters and drinking water at worksites.

7.4 Occupational Health & Safety (OHS):

- Compliance with Building and Other Construction Workers Act, 1996.
- Provision of PPE (helmets, gloves, masks, boots, safety harnesses).
- First aid kits and trained personnel on-site.
- Mandatory safety induction and periodic training.
- Accident reporting and compensation mechanism.

7.5 Prohibition of Child and Forced Labour:

- Contractors must certify non-engagement of child labour below 18 years in hazardous work.
- Forced or bonded labour strictly prohibited.

7.6 Gender and Inclusion Measures:

- Equal wages and opportunities for women workers.
- Provision of separate toilets, changing rooms, and crèche facilities (if >50 female workers).
- Sensitization on gender-based violence (GBV), harassment, and zero-tolerance policy.

7.7 Worker Grievance Redressal Mechanism (GRM):

- A separate Workers' GRM within the project GRM.
- Accessible to all categories of workers (direct, contracted, supply).
- Confidential handling of complaints, especially GBV/SEAH.
- Multiple channels: complaint box at site, hotline, community liaison officer.
- Timely resolution and feedback to complainants.

8. Roles and Responsibilities:

- PIU / PMU: Overall monitoring of LMP compliance, reporting to funding agency/World Bank.

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- Contractors: Implementation of labour welfare and OHS measures; maintain registers; ensure legal compliance.
- Supervision Consultants: Monitor contractor compliance, conduct site inspections.
- Village Institutions: Support monitoring of labour influx, community safety, and conflict resolution.

9. Training and Capacity Building:

- Induction training on workers' rights, OHS, GBV/SEAH, and GRM.
- Regular refresher training for workers and supervisors.
- Awareness campaigns in collaboration with local institutions.

10. Monitoring and Reporting:

- Contractors to submit monthly reports on labour use, wage payments, accidents, grievances.
- PIU/PMC to carry out quarterly compliance monitoring.
- Labour audits to verify adherence to laws and LMP provisions.

11. Code of Conduct (CoC):

All workers will sign a Code of Conduct, covering:

- Prohibition of sexual harassment, exploitation, and abuse.
- Respect for local culture and customs.
- Zero tolerance for alcohol/drug use at work sites.
- Respectful behaviour with community members.

12. Budget:

Contractors shall include costs for labour welfare, OHS, training, and GRM in the bid. PIU will allocate resources for monitoring and capacity-building.

Annexure – 1: Standard Contract Clauses for Labour Management and Compliance:

1. General Provisions:

- The Contractor shall comply with all applicable labour laws of India and World Bank's ESS2 on Labour and Working Conditions.
- The Contractor shall ensure fair treatment, non-discrimination, and equal opportunity for all workers, including women, persons with disabilities, and socially vulnerable groups.
- No child labour (below 18 years in hazardous work) or forced labour shall be employed.

2. Recruitment and Employment:

- Priority shall be given to hiring local workers from within the project area in consultation with traditional institutions (Dorbar Shnong, Nokma, Dolloi, Syiem, etc.).

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- All workers shall be registered with complete demographic details.
- Written employment contracts shall be issued to all workers, specifying wages, working hours, benefits, and conditions.

3. Wages and Benefits:

- The Contractor shall pay wages not less than those prescribed under the Minimum Wages Act, 1948, and as notified by the Government of Meghalaya.
- Wages shall be paid at least once every month, preferably through bank transfers.
- Equal pay for equal work shall be ensured for men and women workers.
- Wage slips shall be provided to workers with details of payments and deductions.
- Mandatory contributions (EPF, ESI, Bonus, etc.) shall be made in accordance with applicable laws.

4. Working Conditions:

- No worker shall be required to work for more than 8 hours per day and 48 hours per week, except with overtime compensation as per law.
- Workers shall be entitled to one day of rest every seven days.
- The Contractor shall provide:
 - Adequate drinking water, sanitation facilities (separate for men and women), and rest shelters.
 - Proper accommodation for migrant workers, where applicable.
 - Medical facilities including first aid, doctor-on-call, and emergency transport.

5. Occupational Health and Safety (OHS):

- The Contractor shall comply with the Building and Other Construction Workers Act, 1996 and other safety regulations.
- All workers shall be provided with Personal Protective Equipment (PPE) such as helmets, gloves, boots, safety belts, and masks at no cost.
- Safety induction and regular training shall be provided to workers.
- Accident/incident registers shall be maintained, and accidents shall be reported immediately to the Engineer/PIU.
- Compensation for injury or death shall be provided in line with the Employees' Compensation Act, 1923.

6. Gender Equality and Inclusion:

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- Women workers shall not be discriminated against in wages, work allocation, training, or promotions.
- Separate toilets, washing facilities, and changing rooms shall be provided for women.
- Where more than 50 female workers are employed, the Contractor shall provide crèche facilities as per the Maternity Benefit Act, 1961.
- Sensitization programs on Gender-Based Violence (GBV), Sexual Exploitation and Abuse (SEA), and Sexual Harassment at Workplace shall be conducted.

7. Grievance Redressal Mechanism (GRM):

- The Contractor shall establish a workers' grievance mechanism at the site with multiple options (complaint box, helpline, community liaison officer).
- Grievances shall be resolved within 7 working days and escalated to PIU if unresolved.
- Special confidential channels shall be available for GBV/SEA-related complaints.

8. Code of Conduct (CoC):

- All workers (including sub-contractors and suppliers) shall sign a Code of Conduct covering:
 - Prohibition of sexual harassment, exploitation, and abuse.
 - Respect for local customs, culture, and community norms.
 - No alcohol, drugs, or violence at worksites.
 - Zero tolerance for child labour and forced labour.

9. Monitoring and Reporting:

- The Contractor shall submit **monthly labour reports** including:
 - Number of workers employed (by category, gender, origin – local/migrant).
 - Wage payments and deductions.
 - OHS compliance, accidents/incidents.
 - Grievances received and resolved.
- The PIU/Supervision Consultant shall have unrestricted access to worksites, labour camps, and records for monitoring compliance.

10. Sanctions for Non-Compliance:

- Non-compliance with these provisions shall attract penalties, including:
 - Withholding of payments.
 - Deduction of costs incurred by PIU in ensuring compliance.

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- Termination of contract for repeated violations.

Annexure – 2: Sample Code of Conduct (CoC) for Workers and Supervisors:

Purpose:

This Code of Conduct sets standards of behaviour expected from all workers, supervisors, contractors, and sub-contractors engaged in the Meghalaya Road Projects. Compliance is mandatory.

Commitments of All Workers:

1. Compliance with Laws and Rules:

- I will comply with all Indian labour laws, project labour management rules, and site safety regulations.

2. Respect for Local Communities and Culture:

- I will respect the customs, traditions, and cultural practices of the local communities.
- I will not trespass or misuse community resources without consent.

3. Prohibition of Child Labour and Forced Labour:

- I will not employ or support the use of child labour (under 18 years in hazardous work).
- I will not participate in or allow forced or bonded labour.

4. Safe Work Practices:

- I will wear and use the personal protective equipment (PPE) provided to me.
- I will follow safety instructions and report unsafe conditions or accidents immediately.

5. Gender Equality and Non-Discrimination:

- I will treat women and men equally in work and wages.
- I will not discriminate against anyone based on caste, ethnicity, religion, gender, or disability.

6. Prohibition of Sexual Exploitation and Abuse (SEA)/GBV:

- I will not engage in sexual harassment, exploitation, or abuse of any person.
- I understand that sexual relations with minors (below 18 years) are strictly prohibited and punishable under law.
- I will not exchange money, goods, or services for sexual favours.

7. Prohibition of Drugs, Alcohol, and Violence:

- I will not consume or be under the influence of drugs or alcohol at the workplace.
- I will not engage in fighting, intimidation, or violent behaviour.

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8. Grievance Reporting:

- I will raise concerns and grievances through the established Worker Grievance Redress Mechanism (GRM).
- I will cooperate in resolving grievances fairly.

Acknowledgement:

I, the undersigned, have read and understood this Code of Conduct. I agree to comply with it throughout my employment on the Meghalaya Road Projects. I understand that violations may result in disciplinary action, including termination of employment or legal action.

Worker's Name: _____

Designation/Role: _____

Signature/Thumbprint: _____

Date: _____

Contractor's Representative (Witness): _____

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Annexure 5.3: Occupational Health and Safety Plan (OHSP)

1. Introduction

The Occupational Health and Safety Plan (OHSP) provide guidelines for managing workplace health and safety risks during the construction and operation of MLCIP Projects. It ensures compliance with relevant Indian legislations and World Bank/IFC Environmental and Social Standards (ESS2 & ESS4). The Plan aims to safeguard workers, contractors, communities, and road users from occupational accidents, injuries, and diseases.

2. Objectives

- Prevent workplace accidents, injuries, and occupational diseases.
- Ensure safe working conditions for all project personnel.
- Comply with national legal requirements and international OHS standards.
- Establish procedures for emergency response, accident reporting, and corrective action.
- Promote health awareness and capacity-building of workers.

3. Roles and Responsibilities:

Project Implementation Unit (PIU):

- ✓ Ensure contractor compliance with OHS requirements.
- ✓ Monitor safety performance through site inspections and audits.

Contractor:

- ✓ Prepare and implement site-specific OHS plans.
- ✓ Appoint a Safety Officer for each package.
- ✓ Provide Personal Protective Equipment (PPE) to all workers.
- ✓ Maintain records of accidents, near misses, and corrective actions.

Construction Supervision Consultant (CSC):

- ✓ Verify contractor compliance.
- ✓ Conduct joint safety inspections with PIU and Contractor.
- ✓ Provide training and awareness sessions.

Workers:

- ✓ Follow safety protocols and wear PPE at all times.
- ✓ Report unsafe conditions and accidents immediately.

4. Hazard Identification and Risk Management:

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Key Occupational Hazards:

- ✓ Working at height (bridges, culverts, hill slopes).
- ✓ Roadside excavation, tunneling, and blasting in hilly terrain (If applicable).
- ✓ Exposure to dust, noise, and vibrations.
- ✓ Manual handling and lifting of heavy materials.
- ✓ Vehicle and machinery movement.
- ✓ Electrical hazards from temporary connections.
- ✓ Extreme weather conditions (heavy rainfall, landslides).

Risk Control Measures (Hierarchy of Controls):

- ✓ Elimination – Avoid hazardous practices where possible.
- ✓ Substitution – Use less hazardous materials/processes.
- ✓ Engineering Controls – Guardrails, barricades, warning signs.
- ✓ Administrative Controls – Work permits, job rotation, shift planning.
- ✓ PPE – Helmets, safety shoes, gloves, ear plugs, masks, reflective jackets.

5. Health and Safety Procedures:

General Site Safety:

- ✓ Fencing and barricades around construction sites.
- ✓ Clear signage in English, Garo (local languages).
- ✓ Adequate lighting at night.
- ✓ Safe drinking water, sanitation, and first aid facilities.

Personal Protective Equipment (PPE):

- ✓ Mandatory: Safety helmet, safety shoes, reflective jacket.
- ✓ Task-based: Gloves, ear protection, eye protection, dust masks, harness.
- ✓ Contractor responsible for supply, training, and replacement.

Traffic and Road Safety:

- ✓ Prepare a Traffic Management Plan (TMP).
- ✓ Warning signs, flagmen, and speed limits near work zones.
- ✓ Separate entry/exit for construction vehicles.
- ✓ Awareness campaigns for communities and school children.

Machinery and Equipment Safety:

- ✓ Regular maintenance and inspection.
- ✓ Operator licenses and training.

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- ✓ Emergency shut-off procedures.

Emergency Preparedness and Response:

- ✓ Emergency contact numbers displayed at site.
- ✓ Site-specific Emergency Response Plan (ERP).
- ✓ Fire extinguishers at key locations.
- ✓ First Aid kits with trained first aiders.
- ✓ Tie-ups with nearest Primary Health Centre (PHC)/hospital.

Occupational Health:

- ✓ Pre-employment and periodic medical check-ups.
- ✓ Health awareness on communicable diseases (TB, HIV/AIDS, COVID-19).
- ✓ Separate facilities for men and women workers.
- ✓ Safe accommodation (if labor camps are established).

6. Training and Capacity Building:

Induction training for all workers before mobilization.

Tool-box talks (daily/weekly on-site briefings).

Specialized training: Working at height, First aid and firefighting, Electrical safety, Defensive driving.

7. Incident Reporting and Monitoring

All incidents (accidents, near misses, unsafe acts) must be reported within 24 hours.

Contractor maintains Incident Register.

CSC/PIU investigates major accidents and ensures corrective action.

Monthly OHS performance reports submitted to PIU.

8. Monitoring Indicators:

Indicator	Monitoring Method
Number of accidents and near misses	Incident Register & Reports
Percentage of workers provided with PPE	Site Inspections
Number of safety trainings/tool-box talks conducted	Training Records
Number of safety audits and inspections	Audit Reports
Compliance with OHS standards	Monthly Reports

9. Budgetary Provision:

Contractor must allocate a specific budget for OHS, covering PPE, signage, first aid, training, and worker insurance.

10. Documentation and Record Keeping:

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OHS Policy and Procedures.

Worker orientation and training records.

Medical check-up reports.

Accident/incident investigation reports.

OHS monthly compliance checklists.

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Annexures: OHS Forms and Checklists:

Annexure 1: Accident / Incident Reporting Form:

Date & Time of Incident	
Location of Incident	
Name(s) of Injured Person(s)	
Nature of Injury / Illness	
Description of Incident	
Immediate Action Taken	
Witness Name(s) & Contact	
Reported By / Signature	

Annexure 2: Safety Audit Checklist:

Checklist Item	Yes/No	Remarks
Are all workers provided with appropriate PPE?		
Is PPE being worn correctly?		
Are barricades/signages in place at hazardous areas?		
Are first aid kits available and updated?		
Are fire extinguishers accessible and functional?		
Is site housekeeping maintained?		
Are emergency contact numbers displayed?		
Are tool-box talks conducted regularly?		

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Annexure 3: Toolbox Talk Register:

Date	Topic Discussed	Trainer's Name	Workers Attended (Signatures)

Annexure 4: Medical Check-up Register:

Worker Name	Date of Check-up	Type of Check-up (Pre-employment/Periodic)	Findings / Remarks	Doctor's Signature

Annexure 5: Training Attendance Sheet

Date	Training Topic	Trainer's Name	Worker Name	Signature

Annexure 6: Monthly OHS Performance Reporting Format

Contractor: _____

Package No.: _____

Reporting Month: _____

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Submitted To: PIU (through CSC)

Date of Submission: _____

Section A: Workforce Details:

Indicator	This Month	Cumulative (Project to Date)
Total number of workers employed		
Number of new workers inducted with safety orientation		
Number of skilled operators/drivers licensed		

Section B: Training and Awareness:

Indicator	This Month	Cumulative
Number of safety inductions conducted		
Number of toolbox talks conducted		
Number of safety trainings/workshops conducted		
Number of awareness campaigns (HIV/AIDS, GBV, Road Safety)		

Section C: Health and Medical:

Indicator	This Month	Cumulative
Number of pre-employment medical check-ups		
Number of periodic health check-ups		
Number of health awareness sessions conducted		

Section D: Incidents and Accidents:

Indicator	This Month	Cumulative
Number of fatal accidents		
Number of non-fatal accidents		
Number of near misses reported		
Number of lost workdays due to injury		

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Section E: Safety Compliance:

Indicator	This Month	Cumulative
Percentage of workers provided with PPE		
Number of safety inspections conducted		
Non-compliance issues identified		
Corrective actions implemented from previous inspections		

Section F: Summary:

- Key Safety Achievements: _____
- Major Issues/Challenges: _____
- Corrective Actions Planned for Next Month: _____

Prepared By (Contractor Safety Officer): _____

Verified By (CSC Safety Specialist): _____

Reviewed By (PIU): _____

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	Inspection Items	Implemented?		N/A	Actions to be Taken
		Yes	No		
1.00	General				
1.01	All employees have completed Occupational Health and Safety orientation (induction training)				
1.02	Hazard communication has been implemented				
1.03	Housekeeping acceptable				
1.04	Proper PPE being issued and utilized				
1.05	All construction and emergency signs posted				
1.06	Risk assessment conducted, discussed with all employees, documented and available on site				
1.07	Proper entrances and egress at all work fronts				
1.08	OHS Register and reporting mechanism exists				
2.00	Environment				
2.01	Measures to prevent water pollution in place (clear storm water drains etc.)				
2.02	Water from cleaning of equipment directed to specific locations.				
2.03	Adequate measures taken to prevent contamination of surface water, groundwater and soil by the effluents from storage areas, including raw materials, chemicals, and wastes.				
2.04	Fuel storage tank well banded to contain spill in case of tank failure.				
2.05	Fuelling done away from waterways.				
2.06	Spill kit is available and adequately stocked				
2.07	All site staff trained in emergency spill response.				
2.08	Waste properly managed on the site.				
2.09	Hazardous materials stored appropriately with MSDS's kept nearby.				
2.10	Dust control measures in place.				
2.11	Construction site watered to minimize dust generated				
2.12	Stockpiles of dusty materials covered or watered				
2.13	All vehicles carrying dust materials covered or watered.				

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	Inspection Items	Implemented?		N/A	Actions to be Taken
		Yes	No		
2.14	Proper management of excavated soils.				
2.15	Adequate odor control measures taken.				
2.16	Are plant and equipment well maintained? (any black smoke observed, please indicate the plant/equipment)				
3.00	Site clean and tidy				
3.01	Chemical waste properly stored and labelled				
3.02	Separate labelled containers/areas provided for facilitating recycling and waste segregation				
3.03	Waste removed offsite regularly				
3.04	Is there any waste burnt on site?				
3.05	Are proper measures to control oil spillage during maintenance or to control other chemicals spillage? (e.g. provide drip trays)				
3.06	Are drip trays free of oil and water?				
3.07	Are oil drums and plants/equipment provided with drip trays?				
4.00	Excavation and Trenches				
4.01	All construction and emergency signs posted				
4.02	Barricades present				
4.03	Other underground utility lines mark out				
4.04	Protective systems in place i.e., shoring, shielding and sloping where applicable				
4.05	Proper Ladder available in excavations				
4.06	Excavated soils and equipment away from cut trenches at least one meter away				
5.00	Electrical Safety				
5.01	Do electrical devices have a current inspection and coding?				
5.02	Is electrical equipment properly maintained?				
5.03	Is equipment properly grounded?				
5.04	Are fuses provided?				
5.05	Are electrical dangers posted?				

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	Inspection Items	Implemented?		N/A	Actions to be Taken
		Yes	No		
5.06	Are proper fire extinguisher(s) provided?				
5.07	Are terminal boxes equipped with required covers, and is the cover used?				
5.08	Are circuits labelled in terminal boxes?				
5.09	Are all electrical distribution boards IP rated.				
5.10	LOTO system in place				
5.11	Do electrical circuit has ELCB in place				
6.00	Scaffolding				
6.01	Is erecting the scaffold properly supervised?				
6.02	Are all structural members free from defects, and do they meet safety factors?				
6.03	Are all scaffold connections secured?				
6.04	Are scaffolds erected on solid footing?				
6.05	Is scaffold tied to structure?				
6.06	Are working areas free of dirt, debris, snow, ice, and grease?				
6.07	Are employees protected from falling objects?				
6.08	Is scaffold plumb and square, with cross-bracing?				
6.09	Are guard rails, intermediate rails, and toe boards in place?				
6.10	Is the work platform is 100% Covered				
6.11	Are ropes and cables in good condition?				
6.12	Is fall protection available and in use?				
7.00	Demolition				
7.01	Is an engineering survey provided in writing?				
7.02	Does documentation show operations planned ahead?				
7.03	Is shoring of adjacent structures complete?				
7.04	Are utilities marked and shut off?				
7.05	Are hazardous materials or chemicals removed from any pipes, tanks, or equipment?				

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	<i>Inspection Items</i>	<i>Implemented?</i>		<i>N/A</i>	<i>Actions to be Taken</i>
		<i>Yes</i>	<i>No</i>		
8.00	Fire prevention				
8.01	Are an adequate number and types of fire extinguisher(s) available at labour camps, construction camps, etc?				
8.02	Is fire prevention/extinguisher training performed?				
8.03	Are inspections of fire extinguishers performed periodically?				
8.04	Is the telephone number of the fire department posted?				
8.05	Are fire extinguisher(s) provided on appropriate equipment?				
8.06	Are flammable liquids stored in approved containers and correctly labelled?				
8.07	Are flammable liquids properly stored?				
8.08	Is a fire alarm available?				
8.09	Is a fire evacuation plan established?				
8.10	Are fuel supplies protected from accidental impact?				
8.11	Is fire training given to appropriate personnel?				
8.12	Is equipment shut down prior to refueling?				
8.13	Is equipment properly grounded to fuel trucks before refueling?				
8.14	Are no-smoking signs posted and enforced?				
8.15	Are hydrants clear and access to public thoroughfare open?				
9.00	Hoists, Cranes, and Derricks				
9.01	Are annual inspections completed?				
9.02	Have operators been properly tested, and are their physical exams current?				
9.03	Are daily inspections completed by operators?				
9.04	Are outriggers used?				
9.05	Are power lines deactivated or removed, or are warning signs posted with at least 3M of clearance from overhead power lines				
9.06	Are hoists designed by a competent professional engineer?				
9.07	Is proper loading for capacity at lifting radius?				

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	<i>Inspection Items</i>	<i>Implemented?</i>		<i>N/A</i>	<i>Actions to be Taken</i>
		<i>Yes</i>	<i>No</i>		
9.08	Is equipment operated in accordance with the manufacturer's instructions?				
9.09	Does a competent person inspect the crane?				
9.10	Is equipment properly lubricated and maintained?				
9.11	Is load testing accomplished?				
9.12	Are signal workers properly trained and placed where needed?				
9.13	Are alarms working and audible?				
10.00	Welding and cutting				
10.01	Are all welding and cutting operators qualified?				
10.02	Are screens and shields in place?				
10.03	Is oxygen and acetylene stored properly?				
10.04	Are bottles not in use secured with caps in place?				
10.05	Is proper eye protection and PPE used?				
10.06	Are fire extinguisher(s) located near operations?				
10.07	Is a "hot work" permit completed and posted in areas requiring a permit?				
10.08	Are valves shut off and regulators backed off each night?				
10.09	Are flashback arresters placed on hoses (O2 and fuel gas)?				
10.10	Is electrical equipment grounded?				
10.11	Is the area inspected for fire hazards?				
10.12	Are gas lines and power cables protected and in good				
10.13	Is proper ventilation ensured?				
10.14	Is there a welding permit program?				
11.00	Power Tools				
11.01	Is proper housekeeping conducted where tools are used?				
11.02	Are inspections and proper maintenance of tools performed?				
11.03	Are tools grounded properly or double-insulated?				
11.04	Are tool guards in place and used correctly?				

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	<i>Inspection Items</i>	<i>Implemented?</i>		<i>N/A</i>	<i>Actions to be Taken</i>
		<i>Yes</i>	<i>No</i>		
11.05	Are damaged or malfunctioning tools tagged out until repaired or replaced?				
11.06	Are tools in compliance with local laws and ordinances?				
11.07	Are all operators qualified?				
11.08	Are tools protected from unauthorized use?				
11.09	Is competent instruction and supervision provided?				
11.10	Are cords included in electrical inspection?				
12.00	Traffic Management				
12.01	Area Traffic Management plan is documented and implemented				
12.02	Are traffic signage properly posted and adequate				
12.03	Are there trained personnel i.e., flag men to direct traffic				
12.04	Is there proper delineation of the work front				
12.05	Area traffic diversion signals well luminated during night time				
13.00	Barricades				
13.01	Placed for work site perimeter				
13.02	Placed for all excavations				
13.03	Placed for swing radius of crane or other equipment				
13.04	Placed for drop areas of construction materials				
14.00	Hygiene and Sanitation				
14.01	Drinking water is provided in clean vessels				
14.02	Toilets are available and adequate				
14.03	Hand washing facilities available with soap				
14.04	Toilet range between 1 unit per 6 persons to 1 unit for 15 persons				
14.05	1 urinal units to 15 persons				
14.06	Shower/ Bathroom facilities – 1 unit to 15 persons to 1 unit per 6 persons				
14.07	Separate kitchen facilities. No cooking in living room				
15.00	HIV, AIDS and STIs				
15.01	Awareness campaigns conducted				
15.02	Covid 19 prevention measures implemented				

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	Inspection Items	Implemented?		N/A	Actions to be Taken
		Yes	No		
15.03	Condoms being distributed				
15.04	Employees showing signs and symptoms of covid 19 are allowed to seek medical assistance				
16.00	Policies and Procedures				
16.01	Contractors' health and safety Management Plan is available on site				
16.02	All employees are aware of safe systems of work and the incident management procedure				
16.03	Method statements are available				
17.00	First Aid				
17.01	First Aid kit is available and adequately stocked				
17.02	There is at least one trained first aider on site				
17.03	First aid kit inspection is being conducted				
18.00	Incident Management				
18.01	Incident Management Procedure is available				
18.02	All incidents are reported, documented and investigated accordingly				
18.03	CAPA (Corrective Action and Preventive Action) is being implemented accordingly				
18.04	Emergency contact numbers i.e., health centers/ambulance, safeguards team, first aiders, utility providers, police etc. are available on site				
19.00	Trainings				
19.01	Employees received HSE induction training				
19.02	Training records are available and properly documented				
19.03	Employees involved in high risks activities have received special training				

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Annexure 5.4: Gender-Based Violence (GBV) Action Plan

For

**Meghalaya Logistics and Connectivity Improvement Project (MLCIP) Corridor funded
by the World Bank**

Submitted To



**Meghalaya Infrastructure Development Finance Corporation (MIDFC) Ltd.
House No. L/A-56, Lower Nongrim Hills, Top Floor,
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Prepared By

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Gender-Based Violence (GBV) Action Plan for Road Projects under the Meghalaya Logistics and Infrastructure Connectivity Project (MLICP):

EXECUTIVE SUMMARY – GBV ACTION PLAN:

Purpose & Scope

The GBV Action Plan (GBV-AP) establishes mandatory measures to prevent, mitigate, and respond to Gender-Based Violence (GBV) — including Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH) — linked to road construction and associated civil works in Meghalaya. It applies to:

- Project-affected communities,
- Workers (contractors, subcontractors, labour camps),
- Service providers and stakeholders.

The plan aligns with World Bank Good Practice Notes (2018, 2022) and Indian laws (POSH Act, POCSO Act, DV Act, IPC provisions).

Key Risks Identified

- Labour influx of male-dominated workforce → SEA/SH risks.
- Remote sites, night works, poor lighting → heightened assault risks.
- Inadequate gender-sensitive facilities (WASH, transport).
- Child protection risks under POCSO Act.
- Weak referral services and under-reporting due to stigma.

Core Prevention & Mitigation Measures

At PIU level:

- Adoption and disclosure of GBV-AP.
- Contract clauses requiring GBV compliance.
- Codes of Conduct (CoC) signed by all workers and visitors.

At Contractor level:

- Worker induction on GBV/SEA/SH.
- POSH-compliant workplace redress mechanisms.
- Gender-segregated, safe accommodation and WASH facilities.
- Lighting, safe transport, restricted visitor access.
- Community awareness campaigns in Garo & English.
- Zero tolerance of child labour; child protection protocols.

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Survivor-Centred Response

- **Trained GBV focal persons** at PIU and contractor level.
- Immediate safety, psychological first aid, and confidential referrals.
- Referral network mapped (health, police, legal aid, NGOs, shelters).
- Costs for emergency medical, psychosocial support, and safe shelter covered by project budget.

SEA/SH-Sensitive Grievance Redress Mechanism (GRM)

- Multiple safe channels (toll-free phone, WhatsApp, boxes, female-only options).
- Confidential handling, no retaliation.
- Secure case records, anonymised reporting.
- Independent audits annually.

Capacity Building

- Training for PIU, contractors, workers, and community leaders.
- Refreshers every 6–12 months and during staff turnover.

Monitoring & Indicators

- % workers signing CoC and trained.
- Number of GBV/SEA/SH cases reported and referred within 72 hours.
- Functional GRM response times.
- Availability of gender-sensitive WASH and lighting at worksites.
- Community awareness sessions held.
- Quarterly reporting to PIU and World Bank; immediate notification of severe cases.

Institutional Roles & Resourcing

- PIU: Overall coordination, monitoring, reporting.
- Contractors: Site-level implementation, compliance, training.
- NGOs/Service Providers: Support for referral services and survivor care.
- Authorities (Police, Health, Legal Services): Provide statutory response.
- Budget lines: Training, IEC, focal staff, survivor support, safe infrastructure, monitoring/audits.

Conclusion

The GBV Action Plan provides a comprehensive framework to prevent, mitigate, and respond to gender-based violence, sexual exploitation, and harassment. By integrating prevention measures, victim-cantered response mechanisms, grievance redress systems, capacity building, and robust

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monitoring, the plan ensures that both workers and project-affected communities are protected. Overall, the GBV-action plan strengthens social safeguards, enhances project accountability, and fosters a safe, inclusive, and equitable environment for all stakeholders involved in the MLCIP.

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1. PURPOSE & SCOPE:

This GBV Action Plan (GBV-AP) sets out mandatory prevention, mitigation and response measures for road construction works in Meghalaya where World Bank financing (or Bank-aligned safeguards) and Indian law apply. It covers project-affected communities, workers (contractor staff, labour camps), subcontractors, service providers and other project stakeholders across all civil works packages.

Key objectives:

- Prevent and reduce GBV (including Sexual Exploitation and Abuse — SEA — and Sexual Harassment — SH) associated with civil works and associated influx.
- Provide survivor-cantered, timely and safe response and referrals.
- Ensure compliance with World Bank Good Practice Notes on GBV/SEA/SH and with Indian legislation (POSH, POCSO, Domestic Violence Act, IPC provisions).

2. APPLICABLE POLICY & LEGAL FRAMEWORK:

- World Bank: Good Practice Note — *Addressing Gender-Based Violence in Investment Project Financing involving Major Civil Works* (GPN, 2018) and related ESF/SEA-SH guidance (2022). These set out risk-based requirements for assessment, mitigation, monitoring, and survivor-cantered response.
- **India (national law):**
 - Sexual Harassment of Women at Workplace (Prevention, Prohibition & Redressal) Act, 2013 (POSH) — obligations for workplace prevention and redress (Internal Complaints Committee etc.).
 - Protection of Children from Sexual Offences (POCSO) Act, 2012 — mandatory reporting and child-sensitive procedures for offences against minors.
 - Protection of Women from Domestic Violence Act, 2005 — civil remedies and support services for survivors.
 - Indian Penal Code (notably sections on rape, sexual assault and trafficking), and Criminal Law (Amendment) Acts which expanded definitions and penalties.

These laws, together with World Bank guidance, require a survivor-centred, confidential, timely response and preventive measures such as codes of conduct, worker training, and site/community mitigation measures.

3. RISK PROFILE

- Influx of outside workers and truckers increased SEA/SH and tensions with local communities.
- Remote construction sites and night works with poor lighting elevated risk of assault.
- Male-dominated workforce and lack of female facilities sexual harassment and unsafe sanitation access.
- Child exposure near camps and worksites risk under POCSO.

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- Weak/no confidential reporting channels or fear of retaliation under-reporting.
- Limited local referral services (health, psychosocial, medico-legal) in remote areas.

4. PREVENTION & MITIGATION MEASURES (MINIMUM REQUIRED MEASURES):

4.1 PROJECT-WIDE (OWNER / PIU RESPONSIBILITIES):

- GBV-AP adoption: PIU to adopt and publicly disclose this GBV-AP and ensure contract clauses require contractor compliance. (Incorporate into ESMF/ESCP).
- Codes of Conduct (CoC): Mandatory CoC for all project staff, contractors, suppliers and visitors that prohibit GBV/SEA/SH and set out sanctions. All staff sign before mobilisation. (Annex A: sample CoC).
- Contractual obligations: All construction contracts must include GBV-AP obligations: training, safe accommodation, gender-segregated sanitation, GRM accessible to survivors, and reporting obligations. Contractors' non-compliance leads to sanctions/disqualification per World Bank practice.

4.2 SITE-LEVEL (CONTRACTOR RESPONSIBILITIES):

- **Worker management & workplace safeguards:**
 - Pre-employment checks, code of conduct acknowledgement, worker induction covering GBV/SEA/SH and local cultural sensitivity.
 - Establish workplace sexual harassment redress mechanisms in line with POSH for female employees (Internal Complaints Committee or facility-level arrangement).
 - Gender parity in recruitment where feasible; recruit female staff for site safety focal roles.
- **Accommodation & camp management**
 - Separate, lockable sleeping quarters for women and men; separate WASH (toilet/shower) facilities with lighting and locks; secure water and food distribution; supervision to prevent exploitation.
 - No unauthorised visitors; visitor sign-in and buddy system for movement at night.
- **Infrastructure & site security:**
 - Safe access routes, adequate lighting around camps, work sites, access roads and public toilets; secure fencing where needed.
 - Safe transport to/from work with driver CoC and seat allocation that prevents isolated travel of women at night.
- **Community risk mitigation:**
 - Time-constrained works (limit night work near villages), work scheduling to reduce congregation of workers near sensitive community areas (schools, markets).

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- Community awareness campaigns on GBV risks, rights and available services; engagement with women's groups, panchayats and customary leaders.
- **Child protection:**
- Zero-tolerance for child labour; protocols to prevent children's access to worksites; community awareness regarding POCSO obligations and reporting.

4.3 INFORMATION, EDUCATION & COMMUNICATION (IEC):

- Visible IEC materials in local languages (Garo English) with messages on GBV prevention, how to report, contact points, and confidentiality assurances.
- IEC at community meetings, contractor inductions and with transport operators.

5. SURVIVOR-CENTERED RESPONSE & REFERRAL PATHWAY

All responses must follow survivor-centred principles: safety, confidentiality, choice, non-discrimination, informed consent, and do no harm.

5.1 IMMEDIATE ON-SITE RESPONSE

- Trained GBV focal person (PIU and contractor) receives initial disclosures, ensures immediate safety, provides first-line psychosocial support (PFA), and with consent initiates referrals. Avoid taking statements that are forensic in nature unless survivor requests/consents.

5.2 REFERRAL NETWORK (ESTABLISH BEFORE WORKS BEGIN)

- Map local health facilities capable of clinical management of rape/assault (medico-legal exam), police stations, POCSO Special Juvenile Police Units (for minors), Protection Officers under DV Act, legal aid clinics, NGOs providing GBV/psychosocial support and shelters. Maintain updated contact list in each district/package. (**Annex B: Referral checklist template**).

5.3 REPORTING & MANDATORY OBLIGATIONS

- For GBV incidents involving children, the POCSO Act mandates reporting to police/Authorities — follow legal obligations while protecting the child's best interests.
- Maintain confidentiality: information only shared on a need-to-know basis and with survivor consent, except where law requires mandatory reporting (e.g., POCSO).
- Provide information on legal rights and options, safe transport to services, and cover costs for emergency medical care, psychosocial support and temporary safe shelter (project to establish a budget line).

6. GRIEVANCE REDRESS MECHANISM (GRM) — SEA/SH SENSITIVE

- Multiple reporting channels: in-person (PIU/GRM desk), toll-free phone number, WhatsApp, suggestion boxes near public places, and female-only channels. Ensure anonymity option.

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- Safe intake & triage: Trained staff record basic info, assess risk, and fast-track SEA/SH/child protection cases to a GBV referral team.
- Confidential handling: SEA/SH cases reported through GRM should trigger confidential escalation to the GBV focal person and PIU manager; no public disclosure.
- No retaliation clause: Protect complainants/workers from retaliation; immediate interim measures (reassignment, temporary suspension of alleged perpetrator) while respecting due process.
- Record keeping: Secure, encrypted records with restricted access; aggregate, anonymised data used for monitoring.
- External oversight: Annual audit of GRM handling and quality of response (third-party where appropriate).

7. CAPACITY BUILDING & TRAINING

- PIU & contractor management: 1–2 days training on GBV risks, survivor-centered response, referral pathways, mandatory reporting, confidentiality and monitoring.
- Front-line staff & security personnel: focused training on CoC, safe conduct, non-coercive behaviour, and immediate response protocols.
- Community stakeholders: orientation workshops for village leaders, women's groups, schools on GBV prevention, how to support survivors, and POCsO awareness.
- Regular refreshers: at least every 6–12 months and on staff turnover.

8. MONITORING, INDICATORS & REPORTING

PIU to include GBV indicators in regular monitoring and in the Project's ESMF. Key indicators:

- Number of GBV/SEA/SH incidents reported (disaggregated by type, sex, age).
- Number of reported incidents receiving referral and services within 72 hours.
- Number of staff/contractor workers trained on GBV (by sex).
- Number of worksites with adequate lighting and gender-segregated WASH facilities.
- GRM response times and case closure rates.
- Number of community awareness events and participants (disaggregated by sex/age).

Reporting: Quarterly summary to PIU and World Bank task team; immediate reporting (within 72 hours) of severe incidents to the Bank in accordance with ESF/World Bank requirements.

9. INSTITUTIONAL RESPONSIBILITIES & RESOURCING:

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9.1 ROLES

- Project Implementing Unit (PIU) (Social/GBV focal point): overall GBV-AP coordination, disclosure, oversight of contractors, GRM management, monitoring & reporting.
- Contractor: implement site-level prevention & mitigation measures; maintain confidential incident log; ensure accommodation and transport safety; train workers.
- Third-party service providers/NGOs: provide PSS, legal aid and referrals where government services are limited.
- District Authorities / Police / Health Facilities: receive referrals and provide medico-legal, police investigation and protection services.

9.2 BUDGETING

Allocate dedicated GBV budget lines in each package for:

- Training and IEC materials;
- Staffing (GBV focal points; helpdesk);
- Survivor support (medical, PSS, temporary shelter, legal aid);
- Site infrastructure improvements (lighting, WASH);
- Monitoring, third-party audits and rapid response contingency (emergency funds).

10. CONFIDENTIAL RECORDKEEPING & DATA PROTECTION

- Store GBV case records on secure servers with restricted access; anonymise data used for monitoring.
- No identifying information to be shared in public disclosure documents.
- Follow applicable Indian privacy/data protection rules; obtain survivor consent before sharing any case details except where mandatory reporting applies.

11. COMMUNITY ENGAGEMENT & CULTURALLY SENSITIVE MEASURES

- Engage customary institutions, village councils, women's self-help groups and local NGOs early — co-design awareness and mitigation measures in Garo and English.
- Use local female mobilisers and translators for outreach to women and girls.
- Respect local cultural protocols while aligning with survivor rights and legal obligations.

12. INCIDENT MANAGEMENT WORKFLOW

1. Receipt of disclosure/complaint (GRM / direct to GBV focal person).
2. Initial triage & safety assessment (within 24 hours).

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3. Immediate safety & medical referrals (within 24–72 hours).
4. Offer first-line psychosocial support (PFA) and information on options.
5. If incident involves child — follow POCSO mandatory reporting and child protection protocols.
6. Document (confidential) and monitor case, provide survivor support, and implement interim measures to prevent retaliation.
7. Closure & anonymised reporting; lessons learned to PIU for risk reduction.

12.1 NEXT STEPS / ACTIONS REQUIRED FROM PIU (CHECKLIST)

1. Adopt and disclose this GBV-AP publicly.
2. Complete package-level GBV risk assessments and referral mapping for each project district in Meghalaya.
3. Insert GBV obligations and CoC into tender documents and contracts.
4. Recruit/appoint GBV focal persons in PIU and ensure contractor focal persons.
5. Develop and fund the project-level survivor emergency fund.
6. Begin capacity building for PIU, contractors and local stakeholders, and roll out IEC.
7. Establish GRM channels (including anonymous reporting) and test them before major civil works start.
8. Start monthly monitoring and quarterly reporting (anonymised) and share relevant escalations with the Bank as required.

13. GENDER DISTRIBUTION OF PROJECT-AFFECTED PERSONS:

Out of a total of 20 Project Affected Persons (PAPs), 12 are male (60%) and 8 are female (40 %), indicating an almost equal distribution between male and female beneficiaries. The gender distribution of PAPs is presented in **Table** below.

Table : Gender Distribution of Project-Affected Persons (PAPs)

	Project Affected Persons	Percentage
Male	12	60
Female	8	40
Total	20	100

Source: EIS primary survey – 2025

13. CONCLUSION

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The GBV Action Plan provides a structured framework to prevent and respond to risks of sexual exploitation, abuse, and harassment in Meghalaya Road projects. By embedding accountability in contracts, strengthening referral pathways, and ensuring continuous monitoring, the project commits to a zero-tolerance approach to GBV and to safeguarding the dignity and rights of women, children, and vulnerable groups in Meghalaya.

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Annexure A: Code of Conduct on Gender-Based Violence (GBV), Sexual Exploitation and Abuse (SEA), and Sexual Harassment (SH)

1. Purpose:

This Code of Conduct (CoC) aims to prevent, mitigate, and address Gender-Based Violence (GBV), including Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH), in connection with the Meghalaya Road Projects. All contractor staff, sub-contractors, consultants, suppliers, and project-related personnel are required to understand, sign, and comply with this CoC.

2. Key Principles

All personnel shall:

- Treat women, men, children, and communities with respect, dignity, and fairness.
- Not use language, gestures, or behaviour that is sexually suggestive, abusive, or offensive.
- Maintain a zero-tolerance approach to GBV, SEA, SH, child abuse, and exploitation.
- Respect the cultures, traditions, and laws of Meghalaya while upholding human rights and gender equality.
- Uphold confidentiality and non-retaliation in reporting and responding to GBV/SEA/SH.

3. Prohibited Behaviours

All personnel are strictly prohibited from:

1. Engaging in SEA/SH or any form of GBV against community members, co-workers, or others.
2. Sexual activity with children (anyone under 18 years) regardless of consent — strictly prohibited under Indian law (POCSO Act, 2012).
3. Sexual relationships with community members in exchange for money, goods, employment, or services.
4. Sexual harassment in the workplace, including unwelcome advances, comments, or physical conduct (covered under POSH Act, 2013).
5. Violence, threats, or intimidation against colleagues, community members, or survivors of GBV/SEA/SH.
6. Possession, distribution, or consumption of illegal substances on project sites or camps.
7. Use of children for labour or involving them in hazardous work.

4. Required Conduct

All personnel must:

- Attend mandatory training on GBV/SEA/SH, child protection, and respectful workplace behaviour.
- Sign and acknowledge this CoC before commencing work.
- Report any suspected or actual violations immediately to the GBV Focal Person, GRM channel, or designated authority.
- Support survivor-centered response — ensuring confidentiality, safety, and dignity of survivors.
- Cooperate fully in any investigation or disciplinary process.

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5. Responsibilities of Managers and Supervisors

Managers and supervisors must:

- Ensure that all workers understand and comply with this CoC.
- Promote a respectful workplace and address complaints promptly.
- Take immediate disciplinary action for any CoC violations.
- Ensure safe, gender-segregated living, sanitation, and working conditions at camps and worksites.

6. Sanctions for Non-Compliance

Violations of this CoC will result in disciplinary measures, which may include:

- Verbal or written warning;
- Suspension without pay;
- Termination of employment/contract;
- Referral to law enforcement agencies under Indian Penal Code, POSH Act (2013), POCSO Act (2012), or Domestic Violence Act (2005), as applicable.

7. Acknowledgment

I have read and understood this Code of Conduct. I agree to abide by its terms at all times during my involvement in the Rongjeng - Mangsang Adokgre (RMA) Project. I understand that failure to comply will result in disciplinary action and may lead to termination of my employment and/or legal prosecution.

Name of Worker: _____

Signature: _____

Date: _____

Employer/Contractor: _____

Annexure B:

(B1) Package-Level GBV Risk Assessment

1. Context and Risk Factors

- Geographic context: South West Garo Hills are a predominantly rural, hilly, and forested area with scattered villages and limited road connectivity. Road works will involve camp-based labour near remote settlements.
- Labour influx risk: Medium–High. Contractors are likely to bring in male-dominated workforces from outside Meghalaya (Assam, Bihar, UP, etc.), increasing the risk of SEA/SH and community tensions.
- Demographics & social norms: High proportion of indigenous Garo population, matrilineal system but still strong male decision-making in public domains.
- Local GBV prevalence: Underreporting is common due to stigma and reliance on traditional dispute mechanisms. Women's SHGs and church-based groups are active but formal services are limited.
- Children & adolescents: Vulnerable to risks from worker interaction near schools/market areas; risk of exploitation in exchange for money, gifts, or alcohol.

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2. Risk Rating

- SEA/SH risk: High (due to labour influx, weak formal services, low reporting).
- Workplace sexual harassment risk: Moderate (few women workers expected, but risks exist).
- Child protection risk (POCSO): High (schools located near worksites, children often present on roadsides).
- Community backlash/stigma: Moderate–High (fear of reputational damage leads to underreporting).

3. Mitigation Priorities

- Mandatory Codes of Conduct and repeated training for all workers.
- Strong community awareness in Garo language on GBV/SEA/SH risks and reporting channels.
- Safe camp design (segregated sanitation, lighting, no alcohol zones).
- Engagement of women's SHGs, and church leaders as community allies.
- Partnership with NGOs in East Garo Hills for survivor support; emergency transport for referrals.
- SEA/SH-sensitive Grievance Redress Mechanism (confidential, female focal points).

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(B2) Referral Contact Sheet – South West Garo Hills, Meghalaya

(To be displayed at worksites and GRM desks; in English & Garo versions for accessibility)

Service Type	Institution/Provider	Location & Contact	Notes
Police (Women/Child Protection)	One Stop Centre Ampati, South West Garo Hills,	In-charge: Smti. Sengera Rikrakchi M. Marak, Centre Manager, Mobile: 6009924183.	
Child Protection (POCSO, Juvenile Unit)	District Child Protection Unit (DCPU) South West Garo Hills	DCPO: Smt. Smti. T.M. Sangma — Mobile: 7005689738; E-mail: dcpu.ampati@gmail.com	Emergency: 100.
Health – Emergency & Medico-Legal	State / District helplines	Women Helpline: 181; Child Helpline: 1098; Police emergency: 100 Medical Superintendent, General Medicine 9436113108 State Ambulance/Emergency: 108 (24x7)	For medico-legal: Refer to CHC or Ganesh Das Government Hospital (Shillong) for forensic support.
Psychosocial Support & Counselling	Special Cell for Women (Shillong Police)	Social Welfare Dept: 0364-2500195.	
Legal Aid	Meghalaya State Legal Services Authority (MSLSA):	Helpline: 15100 (toll-free). Address: Shillong	Entitled groups include women, children, SC/ST; apply via district offices.
Shelter / Safe Home	Iohlynti One Stop Centre (Shillong):	Swadhar Greh (Social Welfare): Shelter for distressed women/children; short/long-term stay. Contact via Dept: 0364-2500195.	
Women Helpline (24x7)	National Women Helpline: 181 (toll-free, multilingual support).	Shillong	
Childline (24x7)	Childline India: 1098 (toll-free, nationwide).	Through the DCPU	Women Helpline: 181; Child Helpline: 1098; Police emergency: 100

Advices for Contractors & PIU

- Display this contact sheet in labour camps, site offices, and GRM desks in English and Garo language.
- GBV focal person must ensure confidential referral with survivor consent.
- Keep emergency transport budget ready to transfer survivors to Hospital or NGO services.

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- Regularly update phone numbers and verify service availability.

Annexure C: GBV Incident Intake Form & Triage Checklist:

(Confidential – Do not disclose without survivor consent, except where legally mandated)

Section 1: Survivor Safety & Immediate Needs (Triage)

(To be completed as soon as a survivor discloses an incident)

- Is the survivor in immediate danger? ☐ Yes ☐ No
- Does the survivor need urgent medical attention (within 72 hours)? ☐ Yes ☐ No
- Is the survivor under 18 years old (POCSO Act applies – mandatory police reporting)? ☐ Yes ☐ No
- Does the survivor require emergency shelter? ☐ Yes ☐ No
- Is safe and confidential transport available? ☐ Yes ☐ No

Immediate Action Taken (tick):

- ☐ Survivor referred to hospital
- ☐ Survivor referred to police
- ☐ Survivor referred to psychosocial counsellor
- ☐ Survivor provided temporary safe accommodation
- ☐ Survivor given information on rights and options

Section 2: Basic Incident Details

(Record only minimum necessary information. Do NOT pressure survivor for details.)

- Date of disclosure: ____ / ____ / ____
- Location of disclosure: _____
- Name of focal person receiving disclosure: _____
- Survivor sex/age: ☐ Female ☐ Male ☐ Other | Age: ____
- Survivor consent to referral? ☐ Yes ☐ No (explain options)
- Type of incident (tick all that apply, per survivor's words):
 - ☐ Sexual Harassment
 - ☐ Sexual Exploitation / Abuse (SEA)
 - ☐ Physical Assault
 - ☐ Child Sexual Abuse (POCSO)
 - ☐ Domestic Violence
 - ☐ Other (specify): _____
- Alleged perpetrator: ☐ Worker (contractor) ☐ Community Member ☐ Other
- Incident date (if provided): ____ / ____ / ____
- Incident location (general, no detail): _____

Section 3: Survivor's Choices & Consent

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- Survivor wants to:
 - ☐ Report to Police
 - ☐ Seek medical care
 - ☐ Seek counselling
 - ☐ Request safe shelter
 - ☐ Take no action now
- Survivor consent for information sharing (tick):
 - ☐ Health facility
 - ☐ Police
 - ☐ NGO counsellor
 - ☐ Legal aid
 - ☐ None

Signature/thumbprint of survivor (if willing): _____

Signature of GBV focal person: _____

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Section 4: Referral Actions Taken

- Referred to: _____
- Referral date/time: ____ / ____ / ____ at ____ hrs
- Escort/transport provided: ☐ Yes ☐ No
- Costs covered from emergency fund: ☐ Yes ☐ No
- Follow-up scheduled: ____ / ____ / ____

Section 5: Confidential Recordkeeping

- Case ID (non-identifying code): _____
- File kept in: ☐ Locked cabinet ☐ Secure digital (password protected)
- Access restricted to: PIU GBV focal person + authorised personnel only.
- Survivor informed of confidentiality? ☐ Yes ☐ No

Guidance Notes for Focal Persons

- Use survivor's own words; avoid judgment.
- Do not probe or force details.
- Always prioritise safety, confidentiality, and informed consent.
- If survivor is a minor (<18), you are legally obliged to report to police under the POCSO Act (2012).
- Share only with relevant referral service providers.
- Provide emotional support: listen, believe, and reassure.

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Annexure D: Sample Contract Clauses on GBV/SEA/SH

1. Contractor Obligations

- The Contractor shall adopt and implement the GBV Action Plan as part of the project Environmental & Social Management Plan (ESMP).
- The Contractor shall designate at least one trained GBV/SEA/SH focal person at site level.
- The Contractor shall ensure that all workers (including subcontractors and labour suppliers) sign and adhere to the Code of Conduct (Annex A).

2. Worker Training & Awareness

- All workers must attend mandatory GBV/SEA/SH induction training prior to commencing work.
- The Contractor shall conduct quarterly refresher sessions on:
 - Zero tolerance for SEA/SH
 - Workers' rights under Indian law (POSH Act, POCSO, IPC, Labour Codes)
 - Reporting and referral pathways (Annex B & C).

3. Prohibited Conduct

The Contractor shall ensure that all workers refrain from:

- Sexual harassment, exploitation, or abuse of any person.
- Engaging in sexual activity with persons under 18 years (irrespective of consent – strict liability under POCSO Act).
- Sexual relations with project-affected persons in exchange for money, goods, or services.
- Any form of violence, coercion, or intimidation against workers, community members, or survivors.

4. Reporting & Response

- The Contractor shall establish a confidential grievance redress mechanism (GRM) with channels for anonymous reporting.
- The Contractor shall immediately notify the PIU/Employer's GBV focal person of any reported incident, while safeguarding survivor confidentiality.
- The Contractor shall facilitate survivor referral to medical, psychosocial, legal, and protection services as per the Referral Pathway (Annex B).

5. Accountability & Sanctions

- Failure of Contractor or subcontractor staff to comply with the Code of Conduct or GBV clauses will result in disciplinary measures, including:
 - Formal warning
 - Suspension without pay
 - Immediate termination of employment

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- Reporting to police authorities where legally required.
- The Employer may impose financial penalties for each confirmed GBV/SEA/SH case linked to Contractor personnel, up to 10% of contract value, in addition to legal liability.
- Repeated non-compliance may result in contract termination.

6. Employer Oversight

- The Employer (PIU/Project Authority) shall:
 - Monitor Contractor's compliance with GBV Action Plan during site supervision.
 - Include GBV performance in monthly and quarterly progress reviews.
 - Require Contractor to submit confidential GBV compliance reports.
- Independent audits of GBV measures may be conducted at any stage.

7. Budget Provisions

The Contractor shall allocate sufficient budget to cover:

- Worker training sessions
- Translation and dissemination of Codes of Conduct
- Engagement of GBV focal persons
- Support for safe transport and survivor referral
- Emergency funds for immediate survivor needs (within ethical guidelines).

8. Legal Compliance

- All Contractor actions shall comply with Indian Legislations:
 - POSH Act, 2013 (Sexual Harassment of Women at Workplace Act)
 - POCSO Act, 2012 (Protection of Children from Sexual Offences)
 - IPC Sections 354, 376, 509 (sexual offences)
 - Bonded Labour and Child Labour (Prohibition & Regulation) Acts
 - Relevant Meghalaya state labour laws.
- In case of conflict between national law and World Bank requirements, the higher standard shall prevail.

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Annexure E: GBV Risk Monitoring Framework

1. Objectives

- Track implementation of the GBV Action Plan at package level.
- Ensure accountability of Contractor, PIU, and stakeholders.
- Provide early warning of risks and gaps in prevention/response.
- Report compliance to the World Bank, PIU, and State Authorities.

2. Roles & Responsibilities

Agency	Responsibility
Contractor GBV Focal Person	Maintain records, conduct worker training, track Code of Conduct compliance, report incidents (confidential).
PIU GBV Specialist	Verify contractor reports, conduct site audits, coordinate with service providers, report to World Bank.
Third-Party Monitor / NGO Partner	Independent verification, community consultations, survivor support follow-up.
World Bank Task Team	Oversight, compliance checks, technical guidance.

3. Monitoring Indicators

Domain	Indicator	Frequency	Source of Verification
Contractor Compliance	% of workers who signed Code of Conduct	Monthly	Contractor HR records, random checks
	% of subcontractors oriented on GBV	Quarterly	Training registers
	Number of GBV focal persons appointed & trained	Quarterly	Appointment letters, training reports
Capacity Building	% of workers receiving induction on GBV/SEA/SH	Monthly	Training attendance sheets
	Number of community awareness sessions conducted	Quarterly	PIU/NGO reports
Incident Reporting & Response	Number of GBV complaints received via GRM (disaggregated by type)	Monthly	GRM register (confidential)
	% of cases referred to health, police, legal, or counselling services within 24–48 hrs	Quarterly	Referral Contact Sheet (Annex B)
	% of survivors who report satisfaction with support services (anonymous feedback)	Semi-annual	NGO surveys
Accountability & Sanctions	Number of workers sanctioned for GBV violations	Quarterly	Contractor HR disciplinary records
	Amount of financial penalties imposed for GBV non-compliance	Annual	PIU reports
Community	% of community members aware	Semi-annual	Focus group

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Engagement Audit & Oversight	of GRM and referral pathways		discussions, surveys
	Number of PIU site inspections including GBV monitoring	Quarterly	PIU field visit reports
	Independent audit findings on GBV Action Plan implementation	Annual	Third-party audit report

4. Reporting Framework

- Contractor GBV focal person → submits monthly GBV compliance note to PIU.
- PIU GBV Specialist → consolidates into quarterly GBV report for World Bank.
- Third-party monitor/NGO → provides independent verification reports twice a year.
- Annual consolidated report → submitted to World Bank including lessons learned and corrective actions.

5. Risk Levels & Triggers

Risk Level	Trigger Examples	Required Action
Low	No incidents reported, >80% workers trained, CoC signed	Routine monitoring
Moderate	1–2 minor cases of harassment reported; gaps in training coverage	Corrective Action Plan by Contractor within 30 days
High	>2 confirmed SEA/SH incidents; repeated contractor non-compliance	Financial penalties, management review, intensified monitoring
Critical	Systemic cover-ups, failure to report, survivor backlash	Suspension of contract payments, possible termination, legal escalation

6. Confidentiality & Ethics

- Survivor data must never be disclosed without consent.
- Reports should contain aggregated data only (no personal identifiers).
- Monitoring team must be trained on Do No Harm, GBV principles, and survivor-centered approach.

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Annexure 5.6: Climate Disaster Risks Assessment of Sub-Project Areas

1. Changing Rainfall Patterns

- Extreme rainfall events are increasing in East and North Garo Hills, consistent with regional climate trends, intensifying risks of flash floods and landslides.
- Despite its high rainfall, variability is emerging: erratic monsoon events threaten agriculture, water availability, and infrastructure.
- Local rainfall trends indicate occasional deficits during peak monsoons, affecting traditional jhum cultivation and water-dependent livelihoods.

2. Forest Vulnerability & Biodiversity

- A significant portion of East and North Garo Hills' forests show high vulnerability to climate and human pressures, with NDVI analyses indicating localized forest degradation.
- Key concerns include loss of forest cover, declining carbon stocks, and pressures on biodiversity hotspots, particularly in high-altitude and northern areas.

3. Localized Vulnerability Hotspots

- Block-level analysis in East and North Garo Hills identifies several highly vulnerable areas, driven by limited rural credit, low household incomes, constrained health and education services, and dependence on forest resources.
- These vulnerabilities compound exposure to climate-induced hazards, particularly landslides and soil erosion in steep terrain.

4. Socioeconomic and Ecological Impacts

- Agriculture, largely rain-fed, faces crop failures due to erratic rainfall and shifting monsoon patterns.
- Water resources, including streams and catchments, are under stress, affecting hydropower potential and domestic supply.
- Forest-dependent livelihoods and eco-tourism are disrupted due to forest degradation, biodiversity loss, and changing climatic conditions.

5. Potential impacts of Climate Change trend on road transport infrastructure

Due to the uneven climatic behaviour, it is essential that climate mitigation and adaptation plans to combat the impacts of climate change are factored in the development process to avoid economic burden of adaptation in the long run, and gain from new opportunities that will be thrown up along the way. The Potential impacts of Climate Change trend on road transport infrastructure are provided in Table below:

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Table: Potential impacts of Climate Change trend on road transport infrastructure

Climate Trend / Parameter	Observed Pattern	Impact on Road Infrastructure	Adaptation measures
<ul style="list-style-type: none"> High Rainfall Changes in the seasonal and annual average rainfall 	<p>-- Extreme monthly rainfall (2,020.0 mm in 2020).</p> <p>i. Impact on soil moisture levels, affecting the structural integrity of roads, culverts, bridges standing water on the road base</p> <p>ii Risk of flood from runoff, landslides, slope failures and damage to roads if changes occur in the precipitation pattern</p>	<ul style="list-style-type: none"> - Increased risk of flooding leading to submersion of roads. - Erosion of road embankments and landslides in hilly terrains. - Structural damage to culverts and bridges. 	<ul style="list-style-type: none"> -Certain critical sections affected by overland flooding of the road raised (vertical alignment, embankment improvement) to be free from the onslaught of flooding events under intense precipitation. -Road asset survey has considered certain critical road sections where the sub-grade strength and integrity were found to be compromised; the sub-grade strength specification meeting the recent-most IRC specifications has been adopted. -The highest assessment of design discharge for sizing culverts and bridges from among the several discharge methods as outlined in recent IRC guidelines has been adopted. -In terms of floodwater conveyance to prevent stagnation, closed concrete drains in settlement pockets have been provided. -Improved cross-drainage capacities required for the quick conveyance of floodwater by replacing
		-	

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Climate Trend / Parameter	Observed Pattern	Impact on Road Infrastructure	Adaptation measures
			<p>small diameter pipes with box culverts with higher discharge openings has been considered.</p> <p>-The bottom of the sub-grade has been kept 0.6m above HFL, to avoid over topping, water-logging of the road surface</p>
Rising Temperatures	Sot West Garo Hills- between 20°C to 26°C, and night-time lows dipping to 10°C to 15°C	<p>-Higher temperatures cause thermal expansion of road materials, leading to surface cracks.</p> <p>- Softening of asphalt during hot days can cause deformation and rutting.</p>	<p>a. An adequate binding layer thickness has been proposed to offset the wear, surface fatigue, and rutting under climate stresses.</p> <p>b. In terms of pavement integrity, the choice of viscosity grade VG30 has been maintained</p>
Landslide Risk	- Frequent rainfall and runoff events increase landslide susceptibility in the district's	<p>- Roads in hilly areas may face closures due to landslides.</p> <p>- Increased repair</p>	

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Climate Trend / Parameter	Observed Pattern	Impact on Road Infrastructure	Adaptation measures
	terrain	costs for damaged road sections and disrupted connectivity to remote areas.	

6. Adaptation and Mitigation Measures

To build resilience and protect communities and ecosystems in project area, the following measures are recommended:

- **Slope and Road Stabilization:** Retaining walls, bioengineering techniques, and slope stabilization to prevent landslides.
- **Infrastructure Resilience:** Use of geotextiles, reinforced pavements, and climate-resilient road materials to withstand heavy rainfall.
- **Drainage and Flood Management:** Construction of culverts, roadside drains, and floodwater channels in low-lying areas to manage runoff.
- **Water Resource Management:** Catchment restoration, rainwater harvesting, and climate-resilient irrigation systems.
- **Monitoring & Early Warning:** Regular maintenance, periodic inspection of roads, and landslide early warning systems.
- **Sustainable Livelihood Support:** Promotion of climate-resilient farming practices, biodiversity-friendly land use, and financial inclusion measures for local communities.
 - Songsak forest is located along the project road corridor at chainages 0.000+3+565. However, as all construction activities will remain confined within the existing Right of Way (RoW), no adverse impact on these community forest is anticipated.

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Annexure 7.2 - Stakeholder Engagement Plan

Prepared for:

**MLCIP - Improvement of Ampati to Purakhasia Road (AP) from
from 20th to 28th Km**

November 2025

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INTRODUCTION/PROJECT DESCRIPTION

Meghalaya stands as a vital gateway in India's northeastern landscape, stitching together the Barak and Brahmaputra Valleys like a lush green bridge of hills and clouds. Road transport forms the lifeline of this mountainous state, carrying more than 80 percent of its freight and virtually all passenger movement. Yet, for nearly half of its people, reliable all-weather roads remain a distant promise, and aging timber bridges continue to restrict mobility, like weary sentinels struggling under modern demands.

To address the challenges mentioned above holistically, the Government of Meghalaya, with financing and technical support from the World Bank, has conceptualized a project titled the Meghalaya Logistics and Corridor Improvement Project (MLCIP). MLCIP aims to provide efficient, resilient, and safe connectivity to key regional, rural corridors, and economic centers in Meghalaya by applying best practices in resource management, reducing greenhouse gas (GHG) emissions, improving road safety, and implementing an asset management system. The state aims to significantly increase agriculture's economic contribution and per capita income by improving market access through an efficient, all-weather transport and logistics infrastructure and services network. The improved network will enhance market access and logistics efficiency, reduce average cost/time for select agriculture and horticulture products along key economic corridors, and strengthen institutional capacity for managing efficient, climate-resilient, and safe transport and logistics infrastructure.

The project envisions:

- Upgrading existing roads to intermediate standards, with context-appropriate paved shoulders.
- Reconstructing and strengthening culverts and bridges to ensure durability and safety.
- Constructing new bridges and cross-drainage structures to secure all-weather connectivity and climate resilience.

Project Development Objective (PDO)

The Project Development Objective (PDO) is to enhance the climate and disaster resilience of critical public infrastructure specifically roads and bridges and strengthen agro-logistics infrastructure and services.

Project Components

The MLCIP will be implemented in Meghalaya and comprises the following components

Component 1. Climate-Resilient Roads, Bridges and Road Safety: Upgrading of selected 740 km roads and 347.5 m of bridges with climate-resilient features against flooding and landslides, including: (i) upgradation of damaged road sections to intermediate lane width; (ii) stabilizing hillside slopes by providing weep holes and applying civil and bio-engineering solutions; (iii) enhancing the resilience of side drains, culverts and bridge structures; protecting valley-side slopes; and widening the road formation; (iv) constructing innovative, climate-resilient bridge structures.

Component 2. Agro-Logistics Infrastructure and Service: Developing a green rural freight and public transportation system including: (a) establishing rural transportation hubs, including truck bays, loading and unloading ramps, container bays, sheds, container yards, offices, refreshment areas, taxi/bus bays, and installing solar panels within the compound of the hubs; (b) establishing a freight

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terminal integrated with a district logistics park; (c) establishment of ropeways for transporting farm products from hills; (d) geo-referenced multipurpose bus/taxi/truck stops at farm-product collection points and habitation clusters; (e) high-speed internet/fiber optics connectivity to hubs and multipurpose bus/taxi stops at collection points; and (f) provision of roadside amenities and marketplaces.

Component 3. Institutional Strengthening: Training programs, workshops, and exposure visits; development of technical manuals, SOPs, and guidelines; inclusion of local knowledge and traditional practices; building the institutional capacity of line departments and community organizations.

Component 4. Contingent Emergency Response Component (CERC) The CERC will support PWD/MIDFC in case of an Eligible Crisis or Emergency in responding promptly and effectively to it as per the Contingent Emergency Response Manual. Following an eligible crisis or emergency, the Recipient may request the Bank to re-allocate project funds to support emergency response and reconstruction.

The MLCIP is being prepared under the Environmental and Social Framework (ESF World Bank's Environmental and Social Framework (ESF).

OBJECTIVE/ DESCRIPTION OF SEP

The overall objective of this SEP is to define a program for stakeholder engagement, including public information disclosure and consultation throughout the entire project cycle. The SEP outlines the ways in which the implementing agencies (Public Works Department, Department of Agriculture, Meghalaya Basin Development Authority) will communicate with stakeholders and includes a mechanism by which people can raise concerns, provide feedback, or make complaints about project activities or any activities related to the project. The details are given in *Annexure -I*

STAKEHOLDER IDENTIFICATION AND ANALYSIS

Stakeholder identification is the process of determining all individuals, groups, or institutions that may be directly or indirectly affected by the project or that may influence its outcomes. Categorization ensures that stakeholders are grouped according to their level of impact, interest, and influence, which helps design tailored engagement strategies.

Methodology

In order to meet best practice approaches, the project will apply the following principles for stakeholder engagement:

- **Openness and life-cycle approach:** Public consultations for the sub projects will be arranged during the whole life cycle, carried out in an open manner, free of external manipulation, interference, coercion, or intimidation.
- **Informed participation and feedback:** Information will be provided to and widely distributed among all stakeholders in an appropriate format; opportunities are provided for communicating stakeholder feedback, and for analyzing and addressing comments and concerns.
- **Inclusiveness and sensitivity:** Stakeholder identification is undertaken to support better communications and build effective relationships. The participation process for the projects

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is inclusive. All stakeholders at all times are encouraged to be involved in the consultation process. Equal access to information is provided to all stakeholders. Sensitivity to stakeholders' needs is the key principle underlying the selection of engagement methods. Special attention is given to vulnerable groups that may be at risk of being left out of project benefits, particularly women, the elderly, persons with disabilities, displaced persons, and migrant workers and communities, and the cultural sensitivities of diverse ethnic groups.

For the MLCIP, the following stakeholders have been identified and analyzed per project component. These stakeholders include affected parties, other interested parties and disadvantaged/vulnerable individuals or groups.

▪ Affected Parties

Project-Affected People (PAPs): Individuals, households, and communities residing in the project area who may be positively or negatively impacted (e.g., landowners, tenants, shopkeepers, transport users). Affected parties are local communities, community members, and other individuals or groups who may experience direct impacts from the project i.e. families residing in areas where project interventions (e.g., road construction, corridor development) are planned; Khasi, Jaintia (Pnar), and Garo communities whose land, resources, or livelihoods may be affected, Women, elderly, persons with disabilities, and marginalized households who may face disproportionate impacts; Village councils, clan leaders, and traditional authorities involved in local governance and decision making, Individuals or groups dependent on forests, rivers, or other natural resources in the project area for livelihood, cultural, or religious purposes; Traders, transport operators, and service providers whose activities may be affected during construction or operation.

Table 1: List of affected parties

Component 1: Climate-Resilient Roads, Bridges and Road Safety	<ul style="list-style-type: none"> • Titleholders, including residential owners, commercial property owners, and tenants whose assets or land may be affected. • Non-titleholders such as squatters, encroachers, and street vendors along the right of way (RoW) whose properties or incomes may be temporarily or permanently affected by land procurement or construction activities. • Land users with cultivated land or other uses along the existing RoW who may be impacted. • Rural road users, pedestrians, residents, and communities that may face temporary inconvenience or restricted access due to construction works • Village Councils (, Nokmas etc) whose community owned lands or assets may be affected. • Religious and Indigenous Faith Institutions whose religious structures or land may be affected.
Component 2: Agro-Logistics Infrastructure and Service	<ul style="list-style-type: none"> • Marginal and small farmers, entrepreneurs, Self-Help Groups (SHGs), and Farmer Producer Groups (FPGs) who are expected to benefit from the agricultural development initiatives. • Rural road users, residents and communities that may be temporarily inconvenienced by construction works.
Component 3: Institutional Strengthening	<ul style="list-style-type: none"> • Exposure visits to similar projects, institutions, or regions to exchange knowledge, share best practices, and adopt innovative approaches. • Preparation of standardized manuals, operating procedures, and guidelines to ensure consistency, efficiency, and sustainability in project planning, implementation, and monitoring.

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Other Interested Parties

- Local associations, cooperatives, self-help groups, and civil society organizations/NGOs working on environmental protection, social inclusion, human rights, and indigenous peoples' welfare;
- Academic and research institutions, universities, and think tanks providing technical expertise;
- Religious and cultural institutions;
- Line departments and agencies such as the Revenue Department, Meghalaya State Pollution Control Board, Forest Department, Horticulture Department, Social Welfare Department, Labour Department, District Child Protection Unit, MBMA etc.;
- Industries, traders, and businesses along the corridors;
- NGOs and CBOs working in the project areas;
- Media
- The general Public.

Stakeholders in Community Development

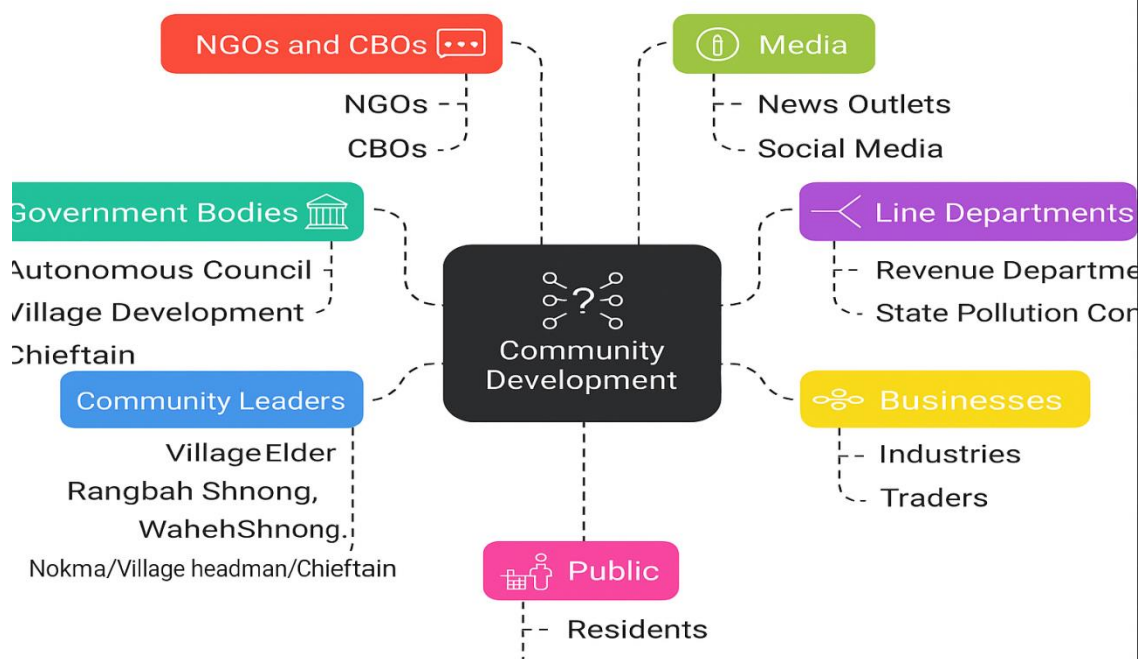


Figure 1: Stakeholders in Community Development

Disadvantaged/vulnerable individuals or groups

Within the Project, the vulnerable or disadvantaged groups may include but are not limited to the following:

Table - 2: Vulnerable Groups

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<p>Component 1: Climate-Resilient Roads, Bridges and Road Safety</p>	<ul style="list-style-type: none"> • Affected parties that belong to the vulnerable category: elderly people, persons with disabilities, ethnic and religious minorities, children, and refugees, Women headed households, scheduled caste, scheduled tribe, and below poverty line (BPL) category— who may be disproportionately impacted due to land procurement. • Persons with disabilities (PWD), elderly who are likely to be affected due to temporary restriction in access. • Indigenous communities (Garos) whose customary lands, traditional territories, and natural resources may be affected, requiring FPIC procedures under ESS7
<p>Component 2: Agro-Logistics Infrastructure and Service</p>	<ul style="list-style-type: none"> • Rural women and girls: Often primary users of public transport for market access, education, or healthcare; they may face safety risks, harassment, or exclusion from new green systems • Low-income farmers and small-scale traders: Rely on freight for goods transport; vulnerable to increased costs or disruptions during transition • Indigenous or ethnic minority communities: In rural project areas, they could be displaced or lose traditional access routes
<p>Component 3: Institutional Strengthening</p>	<ul style="list-style-type: none"> • Women in technical or institutional roles: Often underrepresented in transport/rural development sectors; training may exclude them due to childcare burdens, location biases, or gender norms, perpetuating inequities in manual/SOP creation. • Ethnic minorities or indigenous staff/community representatives: May face language/cultural barriers in training; guidelines could ignore their traditional knowledge, leading to non-inclusive policies. • Persons with disabilities in institutional teams: Training formats (e.g., in-person workshops) might not accommodate mobility or accessibility needs, excluding them from skill-building and manual development.

Vulnerable groups within the communities affected by the project will be further confirmed and consulted through dedicated means, as appropriate. Description of the methods of engagement that will be undertaken by the project is provided in the following sections.


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STAKEHOLDER ENGAGEMENT PROGRAM

Summary of stakeholder engagement done during project preparation

During project preparation, the following public consultation meetings were conducted:

Table 3: Stakeholder Consultation Summary

Sl. No	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
Preliminary consultation						
1	Chopapara	22-08-2025	Local residents	<ul style="list-style-type: none"> Participants appreciated the project and acknowledged its positive impact on the community. Highlighted concerns about non-functional streetlights Requested fair compensation and support in case of any demolitions affecting their properties or livelihoods. 	<ul style="list-style-type: none"> Construct smoother roads to enhance accessibility and improve transportation. Prioritize immediate repairs to address safety and mobility concerns in the community. <p>Ensure fair compensation and support for individuals affected</p>	 <p>Latitude: 25.337388 Longitude: 90.008992 Elevation: 56.12±5.61 m Accuracy: 4.226 m Time: 22-08-2025 13:42</p> <p>Powered by NoteCam</p>
Key Informant Interview						

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Sl. No	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
1	DFO East and North Garo Hill	21-08-2025	DFO	Existing RoW should be maintained at Community land with vegetation and Elephant passing	While designing the road through community land with vegetation areas and identified elephant passing locations, it is recommended that the existing Right of Way (RoW) be maintained without any additional widening, so as to minimize forest clearance and habitat disturbance. The road should be strengthened and upgraded within the available formation width, with slope protection measures such as bio-engineering and turfing instead of concrete structures to retain the natural landscape. At critical elephant crossing points, suitable wildlife-friendly structures such as underpasses or overpasses should be incorporated, along with appropriate signage, speed calming measures, and solar-powered warning systems to alert drivers. Natural drainage patterns must be preserved to	 <p>Latitude: 25.50967 Longitude: 90.599502 Elevation: 286.95±1.04 m Accuracy: 15.03 m Time: 21-08-2025, 14:25</p>

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Sl. No	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
					avoid waterlogging, and noise-reducing pavement surfaces may be adopted to minimize disturbance to wildlife. During construction, night-time activities and dumping of debris within forest stretches should be strictly prohibited. Further, involvement of the local community in monitoring elephant movement, maintaining eco-friendly roadside plantations, and developing alternative fodder sources will help ensure that road development is balanced with ecological conservation and long-term sustainability.	

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Sl. No	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
1	PCCF, Shillo ng	28/8/25	Harish Chaudhry	key issues related to community land with vegetation management and local dependency were highlighted. The seasonal frequency of elephant movement in the project area was discussed, along with potential risks of human-wildlife conflict. The need for appropriate mitigation measures, such as road safety provisions and conservation-friendly design features, was emphasized.	<ul style="list-style-type: none"> Table topping will be done for smooth movement of elephant. <p>Existing RoW should be maintained at community land with vegetation and Elephant passing</p>	


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Sl. No	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
1	DPR Consultant	26-08-2025	DPR Consultants	<ul style="list-style-type: none"> Preliminary observations from an 8 km site visit were presented, along with information requirements. Current data for Existing Right of Way (EroW) and Proposed Right of Way (ProW) is unavailable. ProW will be considered as 12 meters, in accordance with relevant codes for state highways. A topographic survey has been conducted within a 60-meter width. 	<ul style="list-style-type: none"> Incorporate the 12-meter Proposed Right of Way (ProW) into the design to ensure compliance with relevant codes for state highways. Utilize the data from the topographic survey conducted within a 60-meter width to inform the design process and address any topographical challenges. Develop flexible design options that can accommodate variations in the ProW, ensuring that any potential adjustments can be made without significant delays. Integrate drainage solutions into the design to manage water runoff effectively, particularly in areas prone to landslides or flooding. Consider the inclusion of safety features such as guardrails and proper signage to enhance road safety along the newly proposed road alignment. Plan for ecological assessments to ensure that the road design minimizes environmental impacts, especially in sensitive areas identified during the site visit. Allow for future expansion possibilities in the design to accommodate potential 	 <p>Latitude: 25.58179 Longitude: 91.884458 Elevation: 1510.9±2.04 m Accuracy: 286.1 m Time: 25-08-2025 16:48 Note: Discuss/review</p> <p>Powered by NoteCam</p>



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Sl. No	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
					<p>increases in traffic volume and road usage over time.</p> <ul style="list-style-type: none"> Engage with local communities to gather input and address concerns regarding the design, particularly in relation to access and land. Treatment of land slide in land slide affected stretches. 	
1		16/09/2025	<ul style="list-style-type: none"> Street Vendor 	<ul style="list-style-type: none"> Participants appreciated the project and acknowledged its positive impact on the community. 	<ul style="list-style-type: none"> Construct smoother roads to enhance accessibility and improve transportation. 	
	Youth					

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Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
1		25/09/25	Youth (8 No.)	<ul style="list-style-type: none"> Limited local employment opportunities, inadequate platforms for skill development, and the absence of structured career guidance compel many individuals to migrate in search of better prospects; however, this migration, while serving as a coping mechanism, often exposes them to various social and economic challenges and risks. 	<ul style="list-style-type: none"> Integrate capacity-building and skill development components Encourage microenterprise development by promoting small-scale livelihood opportunities 	

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Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
1		03.10.2025	Youth (20 nos.)	<ul style="list-style-type: none"> Promote skill-building, entrepreneurship , Better road connectivity for transportation of goods and services 	<ul style="list-style-type: none"> Establish feedback and monitoring mechanisms through the Stakeholder Engagement Plan (SEP) Integrate capacity-building and skill development components 	
1		09.10.25	Youth (20 nos.)	<ul style="list-style-type: none"> The youth were also taught about access to proper sanitation and other facilities if employed by the contractor during execution of the project. community members expressed their willingness to provide land for the construction of 	If any issues were to be faced by them in the near future then their problems and inconvenience can be brought forward to the GRM.	

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Sl. No	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
				<p>boundary walls,</p> <ul style="list-style-type: none"> Community hall cum bus shelter and separate public toilets for males and females. <p>community members expressed their willingness to provide land for the construction of boundary walls,</p> <ul style="list-style-type: none"> Community hall cum bus shelter and separate public toilets for males and females. They will formally submit written consent for the construction of these proposed structures. 		

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Sl. No	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
	Women FGD					
1		19.09.2025	Women (13)	<ul style="list-style-type: none"> • Women are eager to contribute economically but are constrained by limited opportunities, social barriers, and lack of structured support • There is a pressing need for inclusive, women-centric interventions that promote local entrepreneurship, skills, and connectivity 	<ul style="list-style-type: none"> • Integrate women-focused skill development initiatives • Strengthen participation of women's Self-Help Groups (SHGs) in project-related awareness, monitoring, and plantation maintenance programs. 	

Summary of project stakeholder needs and methods, tools, and techniques for stakeholder engagement

The Stakeholder Engagement Plan below outlines the engagement process, methods, including sequencing, topics of consultations and target stakeholders. The World Bank and the Borrower do not tolerate reprisals and retaliation against project stakeholders who share their views about Bank-financed projects.

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Stakeholder engagement plan

Table: 4 Stakeholder Engagement Plan

Project Stage	Estimated Date/Time Period	Topic of consultation / message	Method used	Target Stakeholders	Responsibilities
Preparation and Implementation stage	During Environmental and Social Impact Assessment (ESIA) and thereafter quarterly	<ul style="list-style-type: none"> - Present the project and receive feedback on project activities, timelines of civil works, and physical restrictions, if any. - Consult on key risks and impacts - Prior information on Workplan and Work schedules - Share details on GBV/ SEA/SH prevention and mitigation measures. <p>Give information on Grievance Redressal Mechanism</p>	<ul style="list-style-type: none"> • Community consultations • Public Meetings • Site visits 	General Public	MPWD and ESIA Consultant
Preparation stage	During ESIA, and thereafter monthly till disbursement is completed.	<ul style="list-style-type: none"> - Present the project and receive feedback on project activities, - Consult on key risks and impacts - Seek Free, Prior, and Informed Consent (FPIC) as per the World Bank ESS7 (Annex 4) - Compensation and R&R provisions as per the Entitlement matrix including payment modalities and disbursement status. <p>Give information on Grievance Redressal Mechanism</p>	<ul style="list-style-type: none"> • Meaningful consultations (Refer to 4.3) • Surveys • Focus Group Meetings/ Discussions • Village level meetings • Site visits 	Affected Parties	MPWD and ESIA Consultant
Preparation stage	During ESIA and Detailed Project Report (DPR) preparation	<ul style="list-style-type: none"> - Present the project and receive feedback on key risks and challenges related to activities - Propose special provisions in place for vulnerable groups. E.g. Additional assistance for ST, BPL and WHH under entitlement matrix. - Measures to address temporary restriction to access during 	<ul style="list-style-type: none"> • Focus Group Meetings/ Discussions • One-on-one interviews (Using tools and 	<p>Vulnerable groups</p> <p>BPL, Women headed households,</p>	ESIA Consultant MPWD

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Project Stage	Estimated Date/Time Period	Topic of consultation / message	Method used	Target Stakeholders	Responsibilities
		<p>construction period.</p> <ul style="list-style-type: none"> - Specific design interventions for persons with disabilities, women, children and elderly to ensure universal accessibility. - Benefits provided under the project for small and marginal farmers and women entrepreneurs. <p>Give information on Grievance Redressal Mechanism in an accessible manner.</p>	methods to ensure accessibility and full participation)	Persons with disabilities, elderly, Children along with their guardians	
Preparation and Implementation stage	During ESIA and thereafter twice a year	<ul style="list-style-type: none"> - Present the project design, scope, approach, benefits, timelines, progress - Process related to public engagement and entitlements prior to alignment of land for developmental activities - Seek Free, Prior, and Informed Consent (FPIC) as per the World Bank ESS7 for initiating the activities. <p>Give information on Grievance Redressal Mechanism</p>	Consult with Heads of Traditional Institutions, Village Elders, Executive Members of the Village Councils (, Nokmas, etc).	Autonomous District Council, Village Development Council (, Nokmas, etc).	MPWD
Preparation stage	During ESIA, and thereafter monthly till disbursement is completed.	<ul style="list-style-type: none"> - Present the project design, scope, approach, benefits, timelines, progress - Process related to land requirement for the project - Disbursement of compensation and R&R - Any prior permission required for initiating the activities <p>Give information on Grievance Redressal Mechanism</p>	<ul style="list-style-type: none"> - One-on-one interviews - Official letter or notification - Approvals by the district administration - Workshops 	District Administration	MPWD

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Project Stage	Estimated Date/Time Period	Topic of consultation / message	Method used	Target Stakeholders	Responsibilities
			and trainings		
Preparation stage	During ESIA	<ul style="list-style-type: none"> - Present the project design, scope, approach, benefits, timelines, progress - Any prior permission required for initiating activities in tribal areas <p>Give information on Grievance Redressal Mechanism</p>	<ul style="list-style-type: none"> - One-on-one interview - Official letter or notification - Approvals by the department - Workshops and trainings 		MPWD
Implementation stage	During construction phase on monthly basis, till completion of civil works	<ul style="list-style-type: none"> - Compliance on relevant labour norms applicable for construction related activities 	<ul style="list-style-type: none"> - Site inspections <p>Compliance reports and records submission Workshops and trainings</p>	Contractor	MPWD
Implementation stage	Prior to commencement of civil works and thereafter as and when reports are required.	<ul style="list-style-type: none"> - Compliance on relevant environmental norms applicable for construction related activities <p>Required permissions, certificates, etc. to be sought</p>	<ul style="list-style-type: none"> - Official letter or notification - Compliance reports and records submission and 	Meghalaya State Pollution Control Board	MPWD

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Project Stage	Estimated Date/Time Period	Topic of consultation / message	Method used	Target Stakeholders	Responsibilities
			approvals by MSPCB Workshops and trainings		
Preparation stage	During ESIA	<ul style="list-style-type: none"> - Present project information and planned activities - Give information on Grievance Redressal Mechanism 	<ul style="list-style-type: none"> - Face to face and virtual meetings Workshops and trainings	Other Line departments- Social Welfare, Police and transport officials	MPWD
Implementation stage	During construction phase on daily basis, till completion of civil works	<ul style="list-style-type: none"> - Occupational and community health and safety requirements as per ESMP and LMP - Workers' code of conduct and other measures to manage SEA/SH risks Give information on workers' Grievance Redressal Mechanism	<ul style="list-style-type: none"> - Face to face trainings - Toolbox trainings for workers Signages in construction sites and camps	Labor Contractors and workers	Supervision Consultants and Contractors
Preparation and Implementation stage	During ESIA and thereafter twice a year.	<ul style="list-style-type: none"> - Present project information and planned activities - Give information on workers' Grievance Redressal Mechanism - Feedback and support in SEA/SH risk management 	<ul style="list-style-type: none"> - One on one interviews - Face-to-face or virtual meetings, webinars - Seminar and workshops 	Autonomous District Council, Village Development Council (Nokmas, etc).	MPWD

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Project Stage	Estimated Date/Time Period	Topic of consultation / message	Method used	Target Stakeholders	Responsibilities
Preparation and Implementation stage	As and when required.	<ul style="list-style-type: none"> - Present project information and planned activities - Outputs and outcomes of the project - Role and support required from media <p>Success stories</p>	<ul style="list-style-type: none"> - Press Release/ Notes - Monthly Health Bulletins - Inputs for OpEds - Short films/ Reels/Posts for social media <p>Social Media platforms of Meghalaya Government</p>	Media	MPWD

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Strategy to incorporate the view of vulnerable groups

The project will implement differentiated engagement measures for groups requiring special attention including women-headed households, persons with disabilities, elderly persons, economically disadvantaged families, and all indigenous communities. Engagement will ensure accessibility through sign language interpretation, large print materials, accessible meeting venues, flexible timing to accommodate care responsibilities, and culturally appropriate protocols respecting traditional governance structures. These targeted consultations will ensure that the perspectives, concerns, and priorities of vulnerable groups are meaningfully incorporated into project planning and decision-making.

To ensure that all stakeholders especially vulnerable groups can participate meaningfully and access information, the project will adopt the following measures:

Table 5: Strategy to incorporate the views of vulnerable groups

Vulnerable Group	Measures
Women headed households, and women entrepreneurs	<ul style="list-style-type: none"> Ensuring gender balance in engagement teams is critical to fostering trust and creating an environment where all participants, particularly women, feel comfortable sharing their perspectives. Surveys as well as other stakeholder engagement activities, will be designed to accommodate women in unpaid care work, ensuring that they have the opportunity to participate fully in discussions. Flexible scheduling, accessible formats, and supportive measures such as childcare or safe transport will be provided to enable their meaningful engagement. For all in-person community engagement activities, provisions will be made for childcare, safe transport, and secure meeting venues to ensure that participants—particularly women and caregivers—can attend and participate fully. These measures aim to remove practical barriers and create a safe, accessible, and enabling environment for engagement. Gender-segregated consultations and other targeted approaches will be employed to provide women and girls with safe and enabling spaces for participation. These measures aim to encourage open dialogue, ensure that their perspectives are freely expressed, and promote equitable inclusion in project decision-making.
Affected parties belonging to BPL categories	<ul style="list-style-type: none"> All consultations will be scheduled during non-business or off-hours to accommodate participants' availability, ensuring that community members, particularly women and those engaged in work or care giving, can participate fully in the engagement process.
Elderly and people with existing medical conditions	<ul style="list-style-type: none"> The project will identify stakeholders with specific needs who may be at higher risk of being excluded or adversely affected, including women-headed households, persons with disabilities, the elderly, marginalized farmers, and economically disadvantaged groups. Information will be provided in an accessible and user-friendly manner to ensure that all stakeholders, including those with literacy or visual challenges, can understand and engage with project-related content. Measures will include - large print materials and clear, legible fonts; plain and simple local languages All consultations will be conducted in comfortable, accessible, and well-lit venues to ensure participants can engage effectively. Venues will be chosen to accommodate persons with disabilities, the elderly, and other vulnerable groups, providing safe and welcoming environments for open dialogue.

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Vulnerable Group	Measures
Persons with disabilities	<ul style="list-style-type: none"> Information will be provided in accessible formats to ensure inclusion of persons with disabilities and those using assistive technologies. Ensuring accessibility measures are implemented where needed, based on the specific requirements of participants All stakeholder engagement activities will consider and account for gender, age, disability, socio-economic status, and other dimensions of identity and vulnerability. This ensures that consultations are inclusive, that the perspectives of marginalized groups are captured, and that project design and mitigation measures address the needs of those most at risk of exclusion or adverse impacts.
Indigenous Communities	<ul style="list-style-type: none"> FPIC procedures conducted through traditional institutions following customary protocols <ul style="list-style-type: none"> Consultations in local languages (Khasi/Jaintia/Garo) with cultural interpreters Respect for traditional decision-making timelines and consensus-building processes Integration of customary law and traditional knowledge systems Consultation with Village Councils, Rangbah Shnong/ Nokmas, and Village Elders

The project road has Garo community, governed by customary laws and traditional institutions. FPIC ensures that their collective rights and decision-making processes are respected; Constitutional protections (Sixth Schedule) also require consultation and consent from Autonomous District Councils and local communities; World Bank ESS7 (Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities) mandates FPIC when projects may affect customary lands, cultural heritage, or cause relocation. Therefore meaningful consultations will be conducted with affected tribal households, Heads of Traditional Institutions, Nokma/village headmen, and Village Development Committee (VDC) chairpersons in a culturally appropriate manner and will include FPIC procedures where project activities affect customary lands or traditional territories. These consultations will take into account the following factors:

- Early Engagement** – Consultations will begin early in the project planning process to gather initial views on the project proposal and inform project design.
- Encouraging Feedback** – Stakeholder input will be actively solicited to inform project design and identify and mitigate environmental and social risks and impacts.
- Ongoing Process** – Engagement will be continuous throughout the project lifecycle.
- Prior Disclosure of Information** – Relevant, transparent, objective, meaningful, and easily accessible information will be shared in advance, in culturally appropriate formats and the relevant local language, ensuring stakeholders have adequate time for meaningful consultation.
- Responsive Approach** – Feedback from stakeholders will be considered and addressed systematically.
- Inclusive Engagement** – Efforts will be made to support active and inclusive participation of all project-affected parties.
- Free from Manipulation or Coercion** – Consultations will be conducted without external interference, discrimination, intimidation, or coercion.
- Documentation and Disclosure** – All consultations will be documented and disclosed by the Meghalaya Public Works Department (MPWD) to ensure transparency and accountability.

Reporting back to stakeholders

Stakeholders will be kept informed as the project develops, including reporting on project environmental and social performance and implementation of the stakeholder engagement plan and

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Grievance Mechanism, and on the project's overall implementation progress.

- **Internal Reporting:** The Project Management Unit (PMU) and implementing agencies will maintain comprehensive records of all stakeholder engagement activities, including meeting minutes, attendance sheets, feedback received, and grievances addressed.
- **External Reporting:** Periodic reports on stakeholder engagement will be shared with government authorities, funding agencies, and local communities, highlighting consultation activities, issues raised, and actions taken.
- **Public Disclosure:** Summaries of stakeholder engagement outcomes will be made available through community notice boards, offices of the DPIUs, and digital platforms to ensure transparency.

RESOURCES AND RESPONSIBILITIES FOR IMPLEMENTING STAKEHOLDER ENGAGEMENT ACTIVITIES

Resources

The **Meghalaya Public Works Department (MPWD)** will have overall responsibility for overseeing stakeholder engagement activities. The day-to-day implementation of these activities will be carried out by the **Environmental and Social Cell (E&S Cell)**, which is part of the MPWD's Project Implementation Unit.

The **MPWD** holds ultimate responsibility for the implementation of the Stakeholder Engagement Framework and Plans, ensuring that engagement activities are conducted in a timely, inclusive, and culturally appropriate manner, and that feedback is integrated into project planning and decision-making.

Table 6: Stakeholder Engagement Activities

Agency/ Individual	Role and Responsibility
MPWD	<ul style="list-style-type: none"> • Mobilization of External Expertise - Engage external consultants for conducting Environmental and Social Impact Assessments (ESIAs) and preparing site-specific Environmental and Social Management Plans (ESMPs), Resettlement Action Plans (RAPs), and Indigenous Peoples Development Plans (IPDPs). Undertake Free, Prior, and Informed Consent (FPIC) processes based on meaningful consultations with relevant stakeholders. • Technical Expertise for Vulnerable Groups - Mobilize technical expertise to ensure safe and culturally appropriate consultations with vulnerable groups or on sensitive topics, as required. • Approval and Oversight of Stakeholder Engagement Plan - Review and approve the content of the draft Stakeholder Engagement Plan (SEP), including any revisions. • Approval of Information, Education, and Communication (IEC) Materials - Approve all IEC materials prior to release, including communication materials, PowerPoint presentations, posters, leaflets, brochures, and media inserts (TV, radio, or online). • Authorization of Stakeholder Engagement Events - Approve and authorize all stakeholder engagement events and the disclosure of materials required to support these events, ensuring alignment with the SEP and cultural appropriateness.
MPWD	<ul style="list-style-type: none"> • Provide overall guidance, oversight, and monitoring of the Stakeholder Engagement Plan (SEP) to ensure that engagement activities are conducted effectively, inclusively, and in a

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Agency/ Individual	Role and Responsibility
	<p>culturally appropriate manner. This includes tracking progress, addressing gaps, ensuring compliance with project policies and safeguards, and providing technical and operational support to the implementing teams.</p> <ul style="list-style-type: none"> • Prepare and provide appropriate Information, Education, and Communication (IEC) and other communication materials tailored to different stakeholder categories. These materials will ensure that relevant project information is clearly and effectively conveyed, taking into account stakeholders' literacy levels, languages, cultural contexts, and specific information needs. • Finalize the timing, duration, and sequence of all SEP-related information disclosure and stakeholder engagement activities. This ensures that consultations and information sharing are conducted at times that maximize stakeholder participation and allow sufficient time for meaningful feedback, particularly for vulnerable and marginalized groups. • Organize orientation and capacity-building sessions for MPWD staff to ensure a clear understanding of the Stakeholder Engagement Plan (SEP) and the requirements for its operationalization. This will enable staff to effectively implement engagement activities, follow culturally appropriate consultation practices, and respond to stakeholder feedback in line with project policies and safeguards.
CSC/ PMC/ MPWD	<ul style="list-style-type: none"> • Participate directly in all face-to-face stakeholder meetings or identify suitable representatives to ensure effective engagement. This ensures that stakeholders have a direct point of contact, that consultations are properly facilitated, and that feedback is accurately recorded and addressed. • Review and sign off on the minutes of all stakeholder engagement events to ensure accuracy and completeness. They will also maintain an up-to-date stakeholder database, capturing details of participants, feedback received, and follow-up actions, to support monitoring, reporting, and continuous improvement of stakeholder engagement activities. • Ensure the active participation and inclusion of stakeholders from vulnerable groups, such as women-headed households, persons with disabilities, the elderly, marginalized farmers, and economically disadvantaged households. Special efforts will be made to remove barriers to their engagement and ensure their perspectives are meaningfully considered in project planning and decision-making.

The stakeholder engagement activities will be documented through:

- During the ESIA, a record of stakeholder engagement carried out with — description of the stakeholders consulted, a summary of the feedback received, and a brief explanation of how the feedback was taken into account, or the reasons why it was not— will be documented in the ESIA, ESMP, RAP, IPDP and other E&S instruments prepared.
- During implementation, stakeholder engagement activities will be documented in the MIS tool prepared under MLCP project for E&S risk management.

The budget for the SEP is as follows.

Table 7: The budget for SEP

Budget Category	Quantity	Unit Cost (INR)	Duration	Total (INR)	Remarks
1. Staff & Field Support					
Community Liaison Officers (3 persons)	3	50,000/month	36 months	54,00,000	Slight salary optimization

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Budget Category	Quantity	Unit Cost (INR)	Duration	Total (INR)	Remarks
Social/Communication Consultant	1	60,000/month	24 months	14,40,000	Consultant only during active implementation
Staff Travel & Local Transport	24 months	15,000/month	24 months	3,60,000	Only during engagement phases
Subtotal:				72,00,000	
2. FPIC Meetings & Community Consultations					
FPIC I, II, III (combined logistics)	3 meetings	35,000/meeting	One-time	1,05,000	Hall, refreshments, PA
Cluster Village Consultations	18 events	5,000/event	24 months	90,000	Only priority villages
Subtotal:				1,95,000	
3. Information & Awareness Materials					
Posters & GRM Leaflets	6,000 copies	60/copy	One-time	3,60,000	Key locations, not mass printing
Community Radio & Social Messaging	18 months	15,000/month	18 months	2,70,000	Phased messaging only
Subtotal:				6,30,000	
4. Trainings & Capacity Building					
ESMP + Worker Safety + GRM Training	6 sessions	35,000/session	24 months	2,10,000	PIU + Contractor combined
Women SHG & Youth Livelihood Orientation	6 sessions	15,000/session	24 months	90,000	Targeted groups only
Subtotal:				3,00,000	
5. Monitoring & Feedback					
Mid-Term & Endline Survey (Combined Effort)	1 package	3,50,000	Project-wide	3,50,000	One consultant, not two
6. GRM Implementation					
GRC Training	6 sessions	30,000/session	24 months	1,80,000	Reduced frequency
Suggestion Boxes	50 units	2,500/unit	One-time	1,25,000	Only strategic points
GRM Signages & Hotline Info Boards	Lump sum	—	One-time	1,50,000	
Subtotal:				4,55,000	
7. Contingency / Miscellaneous	Lump sum	—	—	2,00,000	Capped & controlled
Revised Grand Total:				92,30,000	≈ INR 9.23 million

Note: * Salary costs can be indicative.

Management functions and responsibilities

MPWD will be responsible to carry out the Stakeholder Engagement activities. At the same time the PMC supports the Project Management Unit (PMU) in overall coordination, planning, and

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supervision of the project. Preparing and reviewing designs, drawings, DPRs, and bid documents. Ensuring compliance with environmental and social safeguard instruments (ESMF, ESMP, RAP, SEP, LMP, etc.). Where as The CSC provides field-level supervision, quality assurance, and compliance monitoring during construction. Supervising contractor's performance and ensuring adherence to technical specifications and timelines. Monitoring implementation of Environmental, Health, Safety, and Social (EHS&S) measures on-site. Supporting the Environmental and Social Cell and PIUs in verifying ESMP and labour management compliance.

The stakeholder engagement activities will be documented through:

- (a) During the ESIA, a record of stakeholder engagement carried out with — description of the stakeholders consulted, a summary of the feedback received, and a brief explanation of how the feedback was taken into account, or the reasons why it was not— will be documented in the ESIA, ESMP, RAP-IPDP and other E&S instruments prepared.
- (b) During implementation, stakeholder engagement activities will be documented through MoMs, written consents, videography, geo tagged photos, attendance sheets and the monitoring app prepared by E&S Cell of the MPWD.

● GRIEVANCE REDRESSAL MECHANISM

A Grievance Redressal Mechanism is a system that allows not only grievances, but also queries, suggestions, positive feedback, and concerns of project-affected parties related to the environmental and social performance of a project to be submitted and responded to in a timely manner. The main objective of a Grievance Redressal Mechanism is to assist to resolve complaints and grievances in a timely, effective, and efficient manner that satisfies all parties involved. For Sexual Exploitation Abuse/ Sexual Harassment (SEA/SH): The MPWD has setup an Internal Complaints Committee (ICC) for addressing any SEA/SH-related complaints at the workplace. The committee is constituted as per the requirements of the Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013 (POSH Act).

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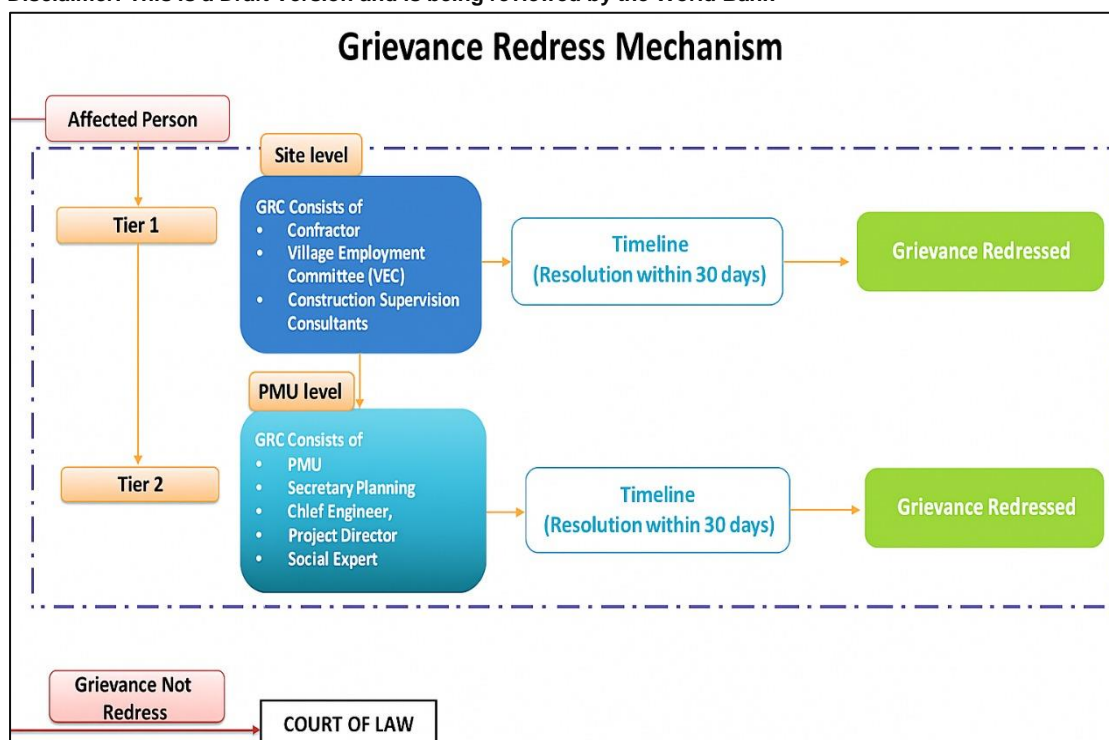


Figure 2: Grievance Redressal Mechanism

Description of Grievance Redressal Mechanism

Table 8: Description of Grievance Redressal Mechanis

Step	Description of process (e.g.)	Timeframe	Responsibility
GRM implementation structure	<p>Grievances under the Project can be submitted through the online grievance register integrated with Helpline and online portal. through emails or the CM Connect Helpline no.</p> <p>Additionally, grievance can also be submitted directly to officials or through letters/emails to the Grievance Redressal Committees (GRCs) formed at the PMU, and site level.</p> <p>If grievance is not resolved at site level GRC within 30 days (depending on the nature of the grievance) the grievance is forwarded to level PMU GRC.</p> <p>When no resolution is made at level (PMC) GRC which need to be resolved within 30 days of receiving the complaint. The process will go to Court of Law.</p>	Throughout the project lifecycle	MPWD
Grievance uptake	Grievances can be submitted via the following channels:	During construction	Public Department, Works

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Step	Description of process (e.g.)	Timeframe	Responsibility
	<ul style="list-style-type: none"> Suggestion boxes in divisional and sub-divisional offices. Toll free Helpline number Web portal (https://www.mpwd.in) E-mail, post and in-person to Site Divisional and State level grievance redressal committee. 	and operation stage	Department of Agriculture, & MBMA.,
Sorting, processing	<p>Any complaint received is immediately forwarded to the site level official (AEs/ supervision consultants/ contractors); logged in the online grievance register; categorized according to the following complaint types: land/ asset related disputes, environment related, construction related disputes, SEA/SH, worker/employment specific, and others.</p> <p>For Sexual Exploitation Abuse/ Sexual Harassment (SEA/SH): The MPWD has setup an Internal Complaints Committee (ICC) for addressing any SEA/SH-related complaints at the workplace. The committee is constituted as per the requirements of the Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013 (POSH Act).</p>	Upon receipt of complaint	Person-in-charge of Online Portal, E&S experts at the Divisional level, E&S Cell, GRMCs
Acknowledgement and follow-up	<p>Receipt of the grievance is acknowledged to the complainant by issuance of a unique identification number (UIN) which will be sent to the complainant through a phone call or SMS within 3 working days.</p> <p>If the complaint is received through Portal or Helpline number, operator will log the complaint and acknowledge its receipt immediately.</p>	Within 3 days of receipt	Person-in-charge of Online Portal, Designated E&S Officers at the Divisional level, E&S Cell, GRMCs
Verification, investigation, action	Investigation of the complaint is led by GRC at site. A proposed resolution is formulated by site level GRC and communicated to the complainant through SMS in the registered mobile number.	Within 7 working days	GRC at site level composed of contractor, PMC, local representative from the community,
Monitoring and evaluation	Data on complaints are collected in project portal and reported to the PMU; and reported to the World Bank every quarter.	Upon receipt of complaint/ quarterly basis	CSC/PMC and E&S Cell
Provision of feedback	Feedback from complainants regarding their satisfaction with complaint resolution is collected through SMS or verbally, once the complaint is resolved.	Upon redressal of complaint	Person-in-charge of Online Portal, E&S experts at the Divisional level, ESMC, GRCs

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Step	Description of process (e.g.)	Timeframe	Responsibility
Training	<p>Training needs for staff/consultants in the PMU, GRC, Contractors, and Supervision Consultants are as follows:</p> <ul style="list-style-type: none"> - Grievance management and documentation - Stakeholder engagement and documentation - Gender sensitization and handling of grievances related to SEA/SH 		E&S Cell, MPWD
If relevant, payment of reparations following complaint resolution	<p>Payment of reparations following complaint resolution will be documented and signed by both parties on receipt of the amount.</p> <p>[Note: Payment of reparation related to employee accidents and fatalities will be undertaken as per the requirements of the Employee Compensation Act, 1923.]</p>	Throughout out the project lifecycle	MPWD
Appeals process	<p>If the complainants are not satisfied with the proposed resolution of the complaint, they can escalate the complaint to the GRCs at the PMU level. The complainants are also free to approach the court of law at any time of their own will at any stage, and accessing the country's legal system can run parallel to accessing the Grievance Redressal Mechanism and is not dependent on the negative outcome of the Grievance Redressal Mechanism . Once all possible means to resolve the complaint have been proposed and if the complainant is still not satisfied, then they should be advised of their right to legal recourse.</p>		SITE at the PMU and divisional level

The Grievance Redressal Mechanism will provide appeals process if the complainant is not satisfied with the proposed resolution of the complaint. Once all possible means to resolve the complaint have been proposed and if the complainant is still not satisfied, then they should be advised of their right to legal recourse. At the Site Level, the site engineers from the DPIUs, Designated E&S Officers of the DPIUs are also included.

The grievance mechanism for workers will be setup by the contractors prior to convening of civil works. The grievance mechanism process has been described in detail in the Labor Management Procedures.

Recourse for Sexual Exploitation Abuse/ Sexual Harassment (SEA/SH): The MPWD has setup an Internal Complaints Committee (ICC) for addressing any SEA/SH-related complaints at the workplace. The committee is constituted as per the requirements of the Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013 (POSH Act). The MPWD has

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in place necessary mechanisms and procedures following a survivor-centered approach that prioritizes survivors' dignity, confidential reporting with safe and ethical documentation of SEA/SH issues. Additionally, SEA/SH referral pathways will be established and communicated to all staff at the PMU, divisional office and site levels including contractors. Further, all contractors have been mandated to setup an Internal Complaints Committee as per the POSH Act. The contractors will also prepare and implement the workers' code of conduct to be always adhered by workers.

● MONITORING AND REPORTING

Summary of how SEP implementation will be monitored and reported

The SEP will be monitored based on both qualitative reporting (based on progress reports) and quantitative reporting linked to results indicators on stakeholder engagement and grievance performance.

SEP reporting will include the following:

- (i) Progress reporting on the Stakeholder Engagement commitments under the Environmental and Social Commitment Plan (ESCP).
- (ii) Cumulative qualitative reporting on the feedback received during SEP activities, in particular (a) issues that have been raised that can be addressed through changes in project scope and design, and reflected in the basic documentation such as the Project Appraisal Document, Environmental and Social Assessment, Resettlement Action Plan- Indigenous Peoples Development Plan (RAP-IPDP), or SEA/SH Action Plan, if needed; (b) issues that have been raised and can be addressed during project implementation; (c) issues that have been raised that are beyond the scope of the project and are better addressed through alternative projects, programs or initiatives; and (d) issues that cannot be addressed by the project due to technical, jurisdictional or excessive cost-associated reasons. Minutes of meetings summarizing the views of the attendees can also be annexed to the monitoring reports.
- (iii) Quantitative reporting based on the indicators included in the SEP.

Reporting back to stakeholder groups

The SEP will be revised and updated as necessary during project implementation.

Quarterly summaries and internal reports on public grievances, enquiries, and related incidents, together with the status of implementation of associated corrective/preventative actions will be collated by responsible staff and referred to the project managers.

Specific mechanisms to report back to the stakeholders include the following: annual reports, newsletters and articles disclosed on the MPWD's websites and workshops. This reporting back to the stakeholders will be done on an annual basis.

Table 9: Reporting back to stakeholder groups

Stakeholder (Group / Individual)	Summary of Feedback / Issues Raised	Response of Project Implementation Team	Follow-up Action / Next Steps
Local Communities (Chopapara & Mebitpara Villagers, Nokmas, Elders, General Community Members)	- Expressed overall support for the Ampati–Purakhasia Road project.- Requested retaining walls, protection works, boundary walls, community hall cum bus shelter, and separate public toilets.- Indicated willingness to provide required land for project components.- Sought continued participation and transparent planning.	- Team assured that community participation will continue through entire design and construction stages.- Requests for retaining walls, boundary walls, bus shelters and sanitation structures will be considered and integrated into the road design.- Community land requirements will be processed through documented written consent.	- Joint site inspections to be carried out with community members.- Final design drawings incorporating community requests to be shared during FPIC-III and at disclosure stage.- Written consent to be collected from landowners/Nokmas where land is provided.
Traditional Governance Institutions (Nokmas / Village Councils)	- Requested ongoing consultation and involvement in final decisions including camp location, land use, and management of workers' conduct.- Confirmed cooperation and readiness to support the project.- Several Nokmas agreed to provide land voluntarily for project structures.	- Project team confirmed that Nokmas and Village Councils will remain key decision-making partners throughout planning and execution.- SOP for FPIC explained, ensuring transparency and inclusiveness.	- Maintain regular consultation meetings through full project cycle.- Nokmas to participate in joint field inspections and planning decisions.- Formal consents to be documented and attached in project records.
Vulnerable Households and Affected Landowners	- Acknowledged that private or community land may be affected for boundary walls and road	- Team explained that land will be taken only after documented, written consent.- Support measures will be	- Identify and validate vulnerable households during detailed surveys.- Ensure provisions and assistance

Stakeholder (Group / Individual)	Summary of Feedback / Issues Raised	Response of Project Implementation Team	Follow-up Action / Next Steps
	improvements.- Expect fair process and community transparency.	provided during implementation where required.	consistent with state rules and safeguard frameworks (RAP/IPDP).
General Road Users & Public Representatives	- Raised need for retaining walls, safer road conditions, and structured roadside improvements.- Appreciated project benefits and supported implementation.	- Project team presented existing and proposed road layouts and protection measures.- Agreed to incorporate concerns into the design before FPIC-III disclosures.	- Revised designs with additional protection works to be presented to community before final approval.
Grievance Redressal Committee (Newly Constituted Community Committee)	- Requested structured channel for complaints and tracking during construction.- Ready to support community monitoring of project issues.	- PWD established the Chopapara/Mebitpara Grievance Redressal Mechanism Committee as per SOP during FPIC-I and II.- Committee empowered to monitor complaints locally.	- GRM to remain active and community accessible throughout execution.- Community members to submit suggestions/complaints directly to GRC when needed.
RODIC Consultants & Technical Representatives	- Presented survey drawings including existing and proposed road widths and protection works.- Requested feedback from community for further design refinement.	- Consultants assured that all feasible suggestions will be integrated and presented in FPIC-III.	- Design revisions to be issued reflecting community needs, including structures and works locations.

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Annexure 1

Sl. No.	Location / District	Road Location / Name	Date of Consultation	No. of Participants	Key Stakeholders Consulted	Key Issues and Suggestions Raised by Participants	Response / Action by Project Implementation Team (PIT)	Follow-up Actions / Next Steps	Timeline / Responsibility (Tentative)
1	South West Garo Hills District	Ampati–Purakhasia Road (FPIC – I) – Chopapara Community Hall	25-09-2025	38	Nokmas, Sordars, PWD Officials, Village Representatives, Community Members	Community expressed strong support for the project. Requested clarification on works, land requirements, and potential impacts. Agreed to cooperate and provide land where needed.	PIT explained project scope, objectives, and FPIC process. Informed that land will only be used with written consent. Introduced GRM and emphasized transparent implementation.	Finalize documentation of village-level consent. Maintain continued engagement with Nokma and village leaders.	Design and Consent Documentation – Oct 2025 / PWD (Roads), Social Team
2	South West Garo Hills District	Ampati–Purakhasia Road (FPIC – II) – Chopapara Community Hall	03-10-2025	35	Nokmas, Village Secretary, Women Representatives, RODIC Consultants, PWD Officers	Requested construction of retaining walls, boundary walls, protection structures, and resolution of site-specific issues. Requested clarity on GRM and future representations.	PIT and DPR Consultants presented existing and proposed survey designs. Assured that feasible requests will be integrated and shown in next meeting. All stakeholders informed that GRM remains active.	Update design with protection works and boundary structures. Continue collecting community feedback.	Design Revision Stage – Oct–Nov 2025 / PWD (Roads), DPR Consultant
3	South West Garo Hills	Ampati–Purakhasia Road (FPIC – III) –	09-10-2025	38	AEE PWD, Executive Engineer, Village Secretary, GRM	Reiterated need for retaining walls, boundary walls, community hall cum	PIT confirmed that community feedback from FPIC-II has been integrated.	Share final design drawings with community before bidding.	Final Design Disclosure – Nov–Dec 2025 / PWD (Roads),

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Sl. No.	Location / District	Road Location / Name	Date of Consultation	No. of Participants	Key Stakeholders Consulted	Key Issues and Suggestions Raised by Participants	Response / Action by Project Implementation Team (PIT)	Follow-up Actions / Next Steps	Timeline / Responsibility (Tentative)
	District	Chopapara Community Hall			Committee, Community Members	bus shelter, separate toilets, and designated locations for labour camps. Community expressed readiness to provide land voluntarily for structures.	Joint inspections will be conducted with village members before final design completion. Written consent will be collected for land parcels.	Document all NOCs and GRM proceedings.	DPR Consultant, Village Councils

Annexure 2: Monitoring and Reporting on the SEP

Key evaluation questions	Specific Evaluation questions	Potential Indicators	Data Collection Methods
GRM. To what extent have project-affected parties been provided with accessible and inclusive means to raise issues and grievances? Has the implementing agency responded to and managed such grievances?	<ul style="list-style-type: none"> • Are project affected parties raising issues and grievances? • How quickly/effectively are the grievances resolved? 	<ul style="list-style-type: none"> • Usage of GRM and/or feedback mechanisms • Requests for information from relevant agencies. • Use of suggestion boxes placed in the villages/project communities. • Number of grievances raised by workers, disaggregated by gender of workers and worksite, resolved within a specified time frame. • Number of Sexual Exploitation, and Abuse/Sexual Harassment (SEA/SH) cases reported in the project areas, which were referred for health, social, legal and security support according to the referral process in place. (if applicable) • Number of grievances that have been (i) opened, (ii) opened for more than 30 days, (iii) resolved, (iv) closed, and (v) number of responses that satisfied the complainants, during the reporting period disaggregated by category of grievance, gender, age, and location of complainant. 	Records from the implementing agency and other relevant agencies
Stakeholder engagement impact on project design and implementation. How have engagement activities made a difference in project design and implementation?	<ul style="list-style-type: none"> • Was there interest and support for the project? • Were there any adjustments made during project design and implementation based on the feedback received? • Was priority information disclosed to relevant parties throughout the project cycle? 	<ul style="list-style-type: none"> • Active participation of stakeholders in activities • Number of actions taken in a timely manner in response to feedback received during consultation sessions with project affected parties. • Number of consultation meetings and public discussions where the feedback and recommendation received is reflected in project design and implementation. • Number of disaggregated engagement sessions held, 	Stakeholder Consultation Attendance Sheets/Minutes Evaluation forms Structured surveys Social media/traditional media entries on the project results

Key evaluation questions	Specific Evaluation questions	Potential Indicators	Data Collection Methods
		focused on at-risk groups in the project.	
Implementation effectiveness. Were stakeholder engagement activities effective in implementation?	<ul style="list-style-type: none"> • Were the activities implemented as planned? Why or why not? • Was the stakeholder engagement approach inclusive of disaggregated groups? Why or why not? 	<ul style="list-style-type: none"> • Percentage of SEP activities implemented. • Key barriers to participation identified with stakeholder representatives. • Number of adjustments made in the stakeholder engagement approach to improve projects' outreach, inclusion and effectiveness. 	<p>Communication Strategy (Consultation Schedule)</p> <p>Periodic Focus Group Discussions</p> <p>Face-to-face meetings and/or Focus Group discussions with Vulnerable Groups or their representatives</p>

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Annexure 3: Requirements for Free, Prior and Informed Consent (FPIC) aligned with the World Bank ESF and National Laws.

The essential six steps for conducting successful FPIC

Step - 1: Send a letter to all stakeholders about FPIC 15 days prior to the meeting.

Step - 2: First round of consultation for the screening and also building awareness and need for FPIC

Step - 3: 2nd round of Consultation is for get the input on design, draft plan and plan and consent for the project.

Step - 4: To share the Minutes of meetings with representative council, ADC, State government and to obtain NOC from autonomous council.

Step - 5: To conduct 3rd round of consultation on draft disclosed documents (ESMF, ESMP, RAP, IPDP, LMP, JCP, Design) to seek their feedback and also outcome from previous consultation.

Step- 6: Seeking written consent for overall project (From ADC, Village Concill, Nokma).

The procedure outlined below for FPIC is as per the requirements of World Bank ESS7 and with reference to the MPWDs ESMF.

Requirements	World Bank ESF (ESS 7)	National Laws (India)	Measures to be Adopted
Application of Free, Prior and Informed Consent (FPIC)	FPIC is required in circumstances where the project will: have adverse impacts on land and natural resources under traditional ownership or customary use; cause relocation of Indigenous Peoples; or have significant impacts on Indigenous Peoples' cultural heritage (ESS7 Paras 25–26).	The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act 2013 (RFCTLARR), Forest Rights Act 2006 (FRA), and AMASR Act 1958 mandate community consent in Scheduled Areas for land acquisition and cultural heritage protection.	FPIC will be undertaken at all road sites and road stretches where customary or community land and resources are affected. The requirement extends beyond Scheduled Areas to all Indigenous communities under the Sixth Schedule districts of Meghalaya.

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Risk Identification for FPIC	Borrower engages independent social specialists to identify risks and potential impacts to Indigenous communities (Para 24 of ESS7).	Rule 5 of RFCTLARR Rules 2015: Independent organization to conduct Social Impact Assessment (SIA).	coordination with traditional institutions, local authorities, and project implementation agencies to ensure full participation and culturally appropriate decision-making by affected communities.
Whose Consent is Needed	Consent is the collective support of affected Indigenous Peoples reached through a culturally appropriate process (Para 26 of ESS7).	Consent of Gram Sabha required in Scheduled Areas; if not constituted, Panchayats or Autonomous District Councils can provide consent (Section 41(3) of RFCTLARR).	For Meghalaya, FPIC will be obtained through the Heads of Traditional Institutions such as the Nokmas, ensuring at least 50% participation and one-third women attendees.
Documentation Process	Borrower documents mutually agreed processes for good-faith negotiations and outcomes, including dissenting views (Para 25(c) of ESS7).	RFCTLARR (SIA and Consent) Rules 2014 require signed records and resolutions of Gram Sabha meetings with terms and conditions of consent (Rule 17).	FPIC documentation will include: minutes of meetings, signatures of attendees, video/photo records, consent resolutions, Records will be disclosed publicly at village and district levels.
Validity of Consent	FPIC valid when collective consent is confirmed through transparent and inclusive process; if FPIC cannot be ascertained, project elements cannot proceed (Paras 25(d) and 27).	Resolution without explicit consent considered invalid (Rule 17(7) of RFCTLARR Rules 2014).	Only subprojects and road stretches receiving documented community consent will proceed; others will be redesigned or relocated in consultation with communities.

Annexure - 4

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Photo documentation of Stakeholder Consultation



Photograph of 1st FPIC meeting held on 25.09.2025 at Chopapara Community Hall at 1.30 PM



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Photograph of II FPIC meeting held on 03.10.2025 at Chopapara Community Hall at 1.30 PM

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Figure 0.1: Photograph of Illrd round of FPIC meeting held on 09th October 2025 at Chopapara Community Hall.

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Annexure 7.3 MOM of FPIC 1,2 & 3

INUTES OF THE FIRST ROUND OF FPIC

Project Title: Ampati Purakhasia Road

Date: 25-09-2025

Time: 1:30 PM

Venue: Chopapara Community Hall

Presiding Officer: Smt. T.S. Momin, AEE, PWD (R), Ampati Sub-Division

Facilitator: Shri Weallin N. Sangma, Executive Engineer, PWD (R), Ampati Division

Members Present: Attendance Sheet enclosed

A.E.E, PWD (R), Ampati Sub-Division, began the meeting by greeting the Nokma, Sordars, and all assembled community members. She explained the reason for holding the consultation, highlighting that the Free, Prior, and Informed Consent (FPIC) process is essential for guaranteeing that the project's planning and execution are both open and fully inclusive of all stakeholders.

Subsequently, the proceedings were handed over to the Executive Engineer, PWD (R), Ampati Division, who provided an in-depth overview of the proposed road development project. He succinctly presented the primary objective, scope, and key activities of the Ampati Purakhasia Road initiative, emphasising its anticipated benefits for the region. The presentation addressed potential impacts including land requirement affecting property owners and resources, tree felling and vegetation loss with ecological consequences, utility relocation, and construction-related disturbances such as noise, dust, and temporary inconvenience to residents. The involvement of local communities in the planning process was highlighted, underscoring collaboration, transparency, and regard for indigenous rights and cultural heritage.

Additionally, the Executive Engineer introduced the Prior and Informed Consent (FPIC), stressing the importance of the FPIC process in ensuring community voices are heard and respected. He referenced the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP), adopted on September 13, 2007, which champions the rights of indigenous communities to have a say in decisions impacting their lands and resources. The EE explained the FPIC framework as a way to empower communities, avoid any undue pressure, and build fair partnerships.

The key FPIC principles were outlined as follows:

- **Free:** Consent is given willingly, without any coercion, manipulation, or pressure, allowing communities to decide freely.
- **Prior:** Consent is sought well ahead of project activities, giving communities enough time to

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discuss and decide through their traditional processes, like village meetings or dorbar.

- **Informed:** Communities are provided with clear, easy-to-understand, and complete information about the project's scope, its potential benefits and challenges (including whether impacts can be reversed), alternatives, and mitigation plans. To ensure everyone understands, discussions were held in Garo language, for clarity and inclusivity.
- **Consent:** The process ensures communities have the power to approve or reject project activities affecting their lands or resources, promoting a community-driven approach to decision-making.

The EE stressed that FPIC is an ongoing dialogue, not a one-off event, meant to foster trust, address concerns, and weave community input into the project's planning and execution. He highlighted the project's alignment with World Bank Environmental and Social Standards, particularly ESS7 (Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities), to safeguard community rights, cultural heritage, and the environment. This meeting was the first step in a series of consultations to create a collaborative framework, and the EE urged everyone to actively participate.

The Environmental and Social Management Framework (ESMF) and Environmental and Social Impact Assessment (ESIA) consultants were introduced, highlighting the engagement of subject matter experts to facilitate effective collaboration between the community and government institutions. During the open discussion, the Nokma (Headman) of Chopapara expressed strong support for the project, indicating that the community is receptive to development initiatives in the region. He also confirmed the absence of objections to the proposed project and assured the community's willingness to provide land required for its implementation.

The EE outlined the GRM, explaining its multi-tiered structure:

- Local committees to handle initial complaints.
- Escalation to district or project authorities if needed.
- Independent oversight for unresolved issues.
- Grievances can be submitted via phone, email, suggestion boxes, or in-person, with resolutions expected within 15 days.
- The GRM committee, including community members, NGOs, and PWD representatives, was chosen during the meeting and will be finalized by the second FPIC consultation.

The Executive Engineer provided a detailed overview of the structure and objectives of the Grievance Redressal Mechanism, which aims to support collaborative monitoring of project-related concerns with the participation of community representatives.

In addition, the "Chopapara/Mebitpara Grievances Redressal Mechanism Committee" was formally established, as outlined in Annexure-A.

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**FORMATION OF CHOPAPARA/MEBITPARA GRIEVANCES REDRESSAL
MECHANISM COMMITTEE DATE: 25th SEPTEMBER 2025**

VILLAGE: CHOPAPARA

**DISTRICT: SOUTHWEST GARO HILL STATE:
MEGHALAYA**

CHOPAPARA/MEBITPARA GRIEVANCES REDRESSAL MECHANISM COMMITTEE

- 1. Shri Kallep A Sangma Nokma of Chopapara**
- 2. Shri Birendra K Sangma Village Secretary of Chopapara**
- 3. Shri Ballith D Marak VEC Secretary**
- 4. Smti. Dingse Ch.Momin**
- 5. Smti. Noritha Ch Momin**
- 6. Shri. Marline Cheyment Areng, Technical S.A Purakhasia Section, Ampati Sub-Division**

The meeting was formally concluded with a vote of thanks delivered by Smt. T.S. Momin, who expressed gratitude for the active engagement and valuable insights contributed by all participants.

Note: In accordance with SOP documentation requirements, photographs and the attendance sheet are enclosed.

(Shri. Weallin N. Sangma)
Executive Engineer, PWD
(Roads), Ampati Division,
Ampati.

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MLCIP Improvement of Ampati to Purakhasia Road (AP) from 20th to 28th Km

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT REPORT

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No. PW/EE/AMP/GEN-62/865

Dated Ampati, the 11th of July, 2022

To,

Kallep A
Chopapara O Nokma
Village

Subject: Meghalaya Logistics and Connectivity Improvement Project as FPIC is conducted

Sir/Madam,

Plakna skangba indaka seachi uiamaskanga chongmotan Meghalaya Public Works Department (PWD) ni gita Meghalaya Logistics and Connectivity Improvement Project (MLCIP) korabae rama jalangkoro songdongengipa mandarangni jangei tanganko nandapara kamkalaniko abachengatanga.

la Free, Prior and Informed consent (FPIC) bakangbangagi skangipa malalte na simangni skankosandianiko dakanichi maina rangkoro songal na dakan ganchi m uaragara

- la project bakanni gimni plak uiamrangko marisogen
- Nokma Kam ni gimni jomabaksa aganchanchigrikiran go darangni draatani gri balapana mar'gen
- la project bakanni gimni ra/chakna bagealna na simangni jakon chu/gimik bildonggen

la Project bakamaramaimao dapanikora/bagen:

Upgradation/Improvement of Ampati, Purakhasia Road from 20.00- 28.00Km

- Block Head quarter badingtang dingtang biapangona rekurana gila namipa ramajal ang an
- Dolongrangko mar'gen
- Bading-chivalanob namipa chol arorama rekuranao nalokanilo mar'gen

Mal Ra'bianibaeog'olkanirangkomao'go:

- Rama tarimiringode bang gila somoina (environment) ba uilwilao buring-bolgrim chiring chibi sikrangna aro songdongengipa mandarangna dongtogiani badisturbance korabana ba gung
- Ramako apal batana darangkongnaba gung

Soogol nookol mandarangni dakoo nanggol kamrang:

la FPIC ko dakenon Songni nokni mandarang

- Plak project bakarangni gimni uia ra'na ba sing'sandi a mar'gen
- PWD departmentni mandarang baksa aganchanchirinnacholko mar'gen
- Kamko kalaniko namnikama namni gawajinnag san Raiko on'na mar'gen

la kamrangko ka/chakana aoma gila na simangni jakon molumolna skanga uiastriko dachina

1. Na'snangni cholioka ba namnikasal somoi an biapko songni mandarang baksa aganchanchirini la uia pachina

2. Na'snangni songo nook songdongengipa manda sakantikon tom'aniona re'bae bakra'bechina la chitna ka sapae Executive Engineer, PWD (Rds) Ampati Division, Ampati na seachi uia pil skade mitel bagen

la kamrangko chusokata na simangni sakantini balonmanian samchatsipa ong'san

Yo fully,

(Shri. : Qiyw a)
Executive Engineer, PWD (Roads),
Ampati Division, Ampati

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1)10110MOUI Dlar.,,c

Office of the A-king Nokma

District : /le/ Garo H^o II

Date : 22/9/2025

To

The Executive Engineer PWA (Road),
Ampati Division S/W Garo Hills (Meghalaya),
Dated, chopapara 22/09/2025
Subject: Meghalaya Logistics and connectivity
improvement projectna FIP ko dakatna
okhamani

in, chingma mande na' bean bakha janapginin
bubjict gita reachi mol'mole liatanga.
chongmotan je bangrangko MLCIP ko dakna
gita he' bangipa 11/9/2025 tariko biap
chopapara Lip School da projectni bidingo
PWA (Road) Departmentni gita nangenggipa
kamrangni ginin he' bae agantala on' packin
mol' molenga
sa nangipa kamrangko, chu' bokatanina
na' himang bakantikom mitel bigen

See wialenggipa
chopapara A-king Nokma
Smt, Changme M. Marak

Changme
Ms C. M. Marak
Nokma II-19 (14)
Chopapara A-king
South West Garo Hills

Lho/ 41 Jania A-king No. /t/-11 ---19

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MINUTES OF 2ND FPIC MEETING FOR MEGHALAYA LOGISTICS AND CONNECTIVITY IMPROVEMENT PROJECT

Project Title: Ampati Purakhasia Road

Date: 03-10-2025

Time: 1:30 PM

Venue: Chopapara Community Hall

Presiding Officer: Smt. T.S. Momin, AEE, PWD (R), Ampati Sub-Division

Facilitator: Shri Weallin N. Sangma, Executive Engineer, PWD (R), Ampati Division

The meeting began with greetings extended to the Nokma, Sordars, and all community members by A.E.E, PWD (R), Ampati Sub-Division. She also welcomed and introduced the representatives from RODIC Consultant. She outlined the purpose of conducting the 2nd Free, Prior, and Informed Consent (FPIC) process, which is intended to ensure that project planning and implementation are transparent and inclusive of all stakeholders.

The meeting proceedings were subsequently handed over to the Executive Engineer, PWD (R), Ampati Division, who provided comprehensive information about the project, including the funding agency, anticipated road width, and the proposed timeline for both design and execution. He also read out the Minutes of the Meeting of the 1st FPIC to the general audience.

Representatives from RODIC Consultant stated the meeting's purpose was to gather community suggestions on the proposed road project. They presented the current 8 km Ampati Purakhasia Road survey drawing including the existing and proposed road widths, proposed protection works etc and invited feedback to be added if possible.

The community offered input on the retaining walls, boundary walls, and related structures. The representative stated that these suggestions will be incorporated into the design and presented at the FPIC 3 meeting. It was also mentioned that suggestions and complaints can be submitted through the GRM during project implementation.

The meeting ended with statements from the village secretary and GRM committee, acknowledging the presence of PWD officials, RODIC Consultant, and all attendees.

Note: In accordance with SOP documentation requirements, photographs and the attendance sheet are enclosed.

(Shri. Weallin N. Sangma)
Executive Engineer, PWD (Roads),
Ampati Division, Ampati.

MLCIP Improvement of Ampati to Purakhasia Road (AP) from 20th to 28th Km

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT REPORT

Disclaimer: This is a Draft Version and is being reviewed by the World Bank

Attendance sheet

Name of the Project Road: Improvement of Ampati - Purakhasia Road (AP)

Location of consultation: Chopalpura Village Church Field

District: S.W. Garo Hills Block/Municipality: Purakhasia Village: Chopalpura

Date: 03/10/2025

Type of consultation: FPIC 2

S.No.	Name	Designation	Contact Number	Signature
22	T. Narsingh Ak		93 66132422	[Signature]
23	Richy		7085777216	[Signature]
24	Kal Singh		9863557937	
25	Nayin Bai		9366132422	[Signature]
26	Saaho St.		600602664	[Signature]
27	Notitha. am		6009340639	[Signature]
28	Ketan Singh		9366469532	[Signature]
29	Dinesh Kumar		9366469532	[Signature]
30	Singhania Moh		6009304699	[Signature]
31	Mohd. Akbar			[Signature]
32	NEERAJ KUMAR	DPR CONSULTANT (R&IE)	9304304046	[Signature]
33	Sunil Pantli	ESIA Consultant	7002388546	[Signature]
34	Hemant Kumar	S.A. Ampati Division	7166654270	[Signature]
35	Mande C. Singh	T.S.A. Ampati Division	7862650830	[Signature]

MLCIP Improvement of Ampati to Purakhasia Road (AP) from 20th to 28th Km

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT REPORT

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Attendance sheet

Name of the Project Road: Improvement of Ampati-Purakhasia Road (A.P)

Location of consultation: Chopalpura Village Church Field

District: S.W. Garo Hills Block/Municipality: Purakhasia Village: Chopalpura

Date: 03/10/2025

Type of consultation: FPIC-2

S.No.	Name	Designation	Contact Number	Signature
1	Shri. W. N. Gangra	EE. Road Dept.	7629085619	
2	Shri. T. S. A. Nandi	AEI PWD(R) Ampati	9974626548	
3	Shri. Prakash Chandra	JE PWD(R) Ampati	9612884948	
4	Jekush D.H.		9166829874	JDM
5	Ruslan D. B.		6009961525	Rus
6	Musung S.			S.
7	Paalish M.		6009151650	Paalish
8	B. Chandra K.		6009473085	B.K.
9	Ramot D.			K.S.
10	Shree K.		9863513254	Shree
11	Lalbam			Lalbam
12	Rohel M.K.		9366976170	Rohel
13	A. K. M.			A.K.M.
14	Dizon			Dizon
15	Nangman D.	Gangra		N.D.S.
16	Salgita M.		9005117956	S.M.
17	W. D. K.		6009314532	W.D.K.
18	Tengnah M.		9182635505	Tengnah
19	Rohel M.K.		9862287367	Rohel
20	K. P. M.		9366945327	K.P.M.
21	Prinson S.		9366283727	P.S.



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MINUTES OF 3RD FPIC MEETING FOR MEGHALAYA LOGISTICS AND CONNECTIVITY IMPROVEMENT PROJECT

Project Title: Ampati Purakhasia Road

Date: 09-10-2025

Time: 1:30 PM

Venue: Chopapara Community Hall

Presiding Officer: Smt. T.S. Momin, AEE, PWD (R), Ampati Sub-Division

Facilitator: Shri Weallin N. Sangma, Executive Engineer, PWD (R), Ampati Division

The meeting commenced with the A.E.E, PWD (R), Ampati Sub-Division extending formal greetings to the Nokma, Sordars, and all community members. She proceeded to clearly articulate the objectives behind conducting the third Free, Prior, and Informed Consent (FPIC) process regarding the proposed road project.

The Executive Engineer, PWD (R), Ampati Division, took over the meeting, shared details from the previous session, and emphasized the value of community involvement and transparent decisions.

He indicated that feedback from the previous meeting is being integrated into the design. Additionally, he noted that portions of community land may be needed for the project, and the details of such requirements will be shared with the communities once the DPR is in its final draft.

Discussions for potential locations for amenities and labour camps were held with the community. PWD officials committed to conducting joint site inspection along with the community members and sharing the details with the consultants for planning and implementation.

AEE notified the community that additional suggestions and grievances can be submitted through the Grievance Redressal Mechanism (GRM) during the execution phase. During the meeting, community members expressed their willingness to provide land for the construction of boundary walls, community hall cum bus shelter and separate public toilets for males and females. They will formally submit written consent for the construction of these proposed structures.

The meeting ended with statements from the village secretary and GRM committee, acknowledging the presence of PWD officials, RODIC Consultant, and all attendees.

Note: In accordance with SOP documentation requirements, photographs and the attendance sheet are enclosed.

(Shri. Weallin N. Sangma)
Executive Engineer, PWD (Roads),
Ampati Division, Ampati.

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MLCIP Improvement of Ampati to Purakhasia Road (AP) from 20th to 28th Km

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT REPORT

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Attendance sheet

Name of the Project Road: Improvement of Ampati - Purakhasia Road (AP)
 Location of consultation: Chapapora Village Church Field
 District: S.W. Garo Hills Block/Municipality: Purakhasia Village: Chapapora
 Date: 09/10/2025 Type of consultation: FPIC-3

S.No.	Name	Designation	Contact Number	Signature
1	Wahman M.			
2	Sabya Mani		7005119956	SPM
3	Kewin Koral		9766945327	KK
4	Pikishan A.			PJA
5	Tangshah K.		8782675305	TAK
6	Narayan			NDS
7	Pison M.		9063541882	PJA
8	Alex Singh			Singh
9	Rahul M.		9366976170	RM
10	Abraham		9863513254	AB
11	Jimot			JM
12	Pikishan A.			PJA
13	Wahman M.			WMA
14	Rajesh M.			RM
15	Gurjit M.		6001607664	GM
16	Sa. M. S.			SM
17	Sengwa M.			SM

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Annexure 8.1: Performance Indicators

Environmental and social components identified of significance in affecting the environment and social conditions at critical locations have been suggested as performance indicators (PIs). For example, near the construction site, a thick layer of dust over the nearby vegetation/leaf is an indication that the dust control measures are not effective. The performance indicators shall be evaluated under three heads as;

- Environmental condition indicators to determine efficacy of environmental management measures in control of air, noise, water and soil pollution.
- Environmental and social management indicators to determine compliance with the suggested environmental and social management measures.
- Social monitoring indicators such as payment of compensation/assistance, no. of grievances resolved, no. of women engaged in livelihood activities, no. of local workforce employed etc.
- Operational performance indicators have also been devised to determine efficacy and utility of the proposed mitigation measures.
- Stakeholder Engagement and Consultation Indicators will evaluate the effectiveness of meaningful consultations conducted throughout the project lifecycle to ensure the transparency and accountability of the project.

The performance indicators and monitoring plans prepared for the road section are presented in **Table 1**.

Details of the performance indicative parameters for each of the component have to be identified and reported during all stages of the implementation.

Table 1: Performance Indicators

Sl. No.	Description of Item	Indicator	Stage	Responsibility
1	<ul style="list-style-type: none"> No. of sites for which Restoration Plans have been prepared No. of Site Restored and Rehabilitated No. of Sites handed over 	Quarries	Pre-Construction	Contractor/CSC/PMC
2	Quantity of Debris and Spoils to be disposed off <ul style="list-style-type: none"> No. of locations Approved for Debris disposal Quantity disposed off at each location No. of locations for which Rehabilitation works have been completed 	Disposal sites	Construction	Contractor/CSC/PMC
3	<ul style="list-style-type: none"> No. of location/s identified for the Construction camp and Construction Plant sites No. of location/ s approved Lay-out/s Approved No. of sites for which Site Restoration and Rehabilitation has been completed 	Construction Camps and Plant Sites	Pre-Construction and Construction	Contractor/CSC/PMC
4	<ul style="list-style-type: none"> No. of Trees to be Cut No. of Trees cut % Progress on the tree removal	Tree cutting	Pre-Construction	MPWD and Forest Department
5	No. of Locations identified for temporary storage areas for storage of the excavated materials to be used in embankment and sub grade	Storage of excavated materials	Pre-Construction and Construction	Contractor
5	Before the onset of monsoon all the debris/excavated material	Silting of Water bodies	Construction	Contractor/CSC/PMC

Sl. No.	Description of Item	Indicator	Stage	Responsibility
	shall be cleaned from the work sites and disposed of at the pre-identified approved locations.			
6	Implementation of enhancement measures for Noise Barrier at sensitive locations	Enhancements	Construction	Contractor/CSC/PMC
7	Drainage <ul style="list-style-type: none"> Length (by type) No. of Locations 	Work sites	Construction	Contractor/CSC/PMC
8	Safety Provisions <ul style="list-style-type: none"> Signage (by type and no.) Crash barriers Footpath 	Work sites	Construction	Contractor/CSC/PMC
9	Soil erosion prevention measures <ul style="list-style-type: none"> Construction of retaining walls Downstream at culvert locations (No. of Locations & length) 	Work sites	Construction	Contractor/CSC/PMC
10	No. of HIV awareness sessions conducted	Registers/Reports/Geotagged Photos	Construction	Contractor/CSC/PMC
11	No. of safety awareness sessions conducted	Registers/Reports/Geotagged Photos	Construction	Contractor/CSC/PMC
12	Accidents/Incidents <ul style="list-style-type: none"> No of accidents/incidents recorded 	Along sub-project road	During construction	Contractor/CSC/PMC
13	Environmental parameter monitoring in accordance with the frequency and duration of monitoring as well as the locations as per the Monitoring Plan	Air Quality Noise Quality Soil Quality Water Quality Report and geotagged photos.	Construction and Operation stage	Contractor through NABL Accredited agency.
14	No. of Training Sessions Organized for <ul style="list-style-type: none"> Departmental Staff Contractors Combined No. of People Trained <ul style="list-style-type: none"> Departmental Staff Contractors 	Training Imparted	Construction /Operational stage	CSC/PMC/MPWD
15	No. of awareness sessions for educating	-	Construction/ Operation	CSC/PMC/MPWD

Sl. No.	Description of Item	Indicator	Stage	Responsibility
	the public about road safety and other environmental aspects (Such as waste dumping, preservation of enhanced sites, pollution and health impacts etc.)		Stage	
16	No. of Trees Planted (Total) <ul style="list-style-type: none"> No. of Trees Planted along Roadsides No. of Trees planted at other locations (such as camps, debris disposal sites and plant areas) No. of trees planted at enhancement sites 	Roadside and other plantation areas	Post construction stage	Contractor/MPWD
17	Survival Rate Trees Planted (Average) <ul style="list-style-type: none"> Compensatory Afforestation Roadside Plantation Other locations (such as camps, debris disposal sites and plant areas Enhancement sites) 	Roadside and other plantation areas	Post construction stage	Contractor/CSC/PMC/MPWD
18	Land, structure & Livelihood compensations paid	Number of PAPs compensated; amount disbursed as per RAP/IPDP	Construction stage	MPWD/ Village Councils as per existing Customary Laws.
19	Vulnerable groups	Type of consultations undertaken; Compensations paid in time.	Construction stage	MPWD/ Village Councils as per existing Customary
20	Grievance Mechanism	Number of complaints resolved within stipulated time; No of RTI applications filed; SEA/SH complaints filed.	Construction stage	Project Grievance Committee/ Site Grievance committee/CSC/PMC/MPWD
21	Stakeholder Engagement	Number and frequency of	Continuous	Contractor/CSC/PMC/MPWD

Sl. No.	Description of Item	Indicator	Stage	Responsibility
	and Meaningful Consultations	consultations held at different project stages. Level of participation from diverse stakeholder groups, Extent to which stakeholder concerns and suggestions have been integrated into decision-making, mitigation measures, Documentation.		