Consultancy Services for conducting an Environmental and Social Impact Assessment (ESIA) of Urban Roads (Town roads) and non-urban roads and Major/Minor bridges and preparation of Environmental and Social Management instruments under MITP (World Bank) initiative

ESIA Report of Jowai Town

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1 CHAPTER-I: INTRODUCTION AND PROJECT BACKGROUND

India has about 6.2 million kilometres of road network, which is one of the largest road networks in the world. The roads in the country are either under administrative control of the Union Government or the State Government concerned. Roads in the country carry about 71 percent of its freight traffic and 85 percent of passenger traffic. National Highways, the primary road network of the country, are under the Union Government whereas; the State Roads comes under the jurisdiction of State Government and their respective Public Work Departments. Out of India's total road network, Urban Roads constitutes about 8.76 percent. In view of increase in commercial traffic with rapid advancement in urban centres, Up-gradation of existing roads has become quintessential in order to properly utilize the existing assets of the state.
The Govt. of Meghalaya through its implementing agency Public Works Department (PWD) is contemplating to upgrade the transport infrastructure by undertaking rehabilitation/improvement works of Urban Roads of some major towns of the State and construction of missing links/bypasses/bridges in the State of Meghalaya. Government of Meghalaya has entrusted PWD with the responsibility of DPR Preparation of Urban Roads (Town roads) in the State of Meghalaya under the World Bank Meghalaya Integrated Transport Project (MITP).

1.1 Details of the project stretches are elaborated below:

1.1.1 Non-Urban Roads

A. Nongstoin-Maweitcorridorsectionis having a length of 35km in the West Khasi Hills districts of Meghalaya state. The Project Road will connect the major towns and villages.

B. Umsning-Jagi Road corridor (SH-8) section is extended up to 40 km length in the districts Ri-Bhoi of Meghalaya state. The project road starts from the junction with National Highway - 6 /Asian Highway. The NH-6 is a Jorabat to Shillong stretches and it also part of the Asian Highway. It is mainly connected between the cities Guwahati to Shillong. The project scope ends at Km 40.00 of SH-8 near Sonidan town

C. Up-Gradation/improvement of road to Export point from the main road Borsora corridor sections is covering a length of 6.50 Km, Cherragoan corridor sections has a length of 6.80 Km, and Bagli corridor sections has a Length of 4.00 Km. These roads are located under the Districts of South West Khasi Hills of Meghalaya state. (**Border road**)

D. Nongpoh-Umden-Sonapur Road corridor section has a length of 25 km in the districts Ri-Bhoi of Meghalaya state. The project road starts from Nongpoh connecting with NH-6 /Asian Highway. The NH-6 is mainly connected between the Guwahati to Shillong location. The scope of project road ends at junctions of RDBR road near by Umden town. List of the project roads are given below table:

1.1.2 Urban Roads

A. Shillong Town Roads:

All the project roads come under East Khasi Hills district; Meghalaya passes through the Shillong town. Eleven roads are parts of this project road having total length of 13.04 Kms.

B. Jowai Town Roads:

All the project roads come under West Jaintia Hills district and part of Jowai town. Total 54 roads are part of this project road having total length of 33.973 Kms.

C. Nongstoin Roads:

All the project roadscome under West Khasi Hills district and part of Nongstoin town. Total 24 roads are part of this project having total length of 21.372 Kms.

D. Williamnagar Town:

All the project roads come under East Garo Hills district and part of Williamnagar town. 35 roads are part of this project having total length of 13.287 Kms.

The present Environment and Social Impact Assessment (ESIA)report has been prepared for the **Jowai Road corridor** under Urban Roads.

1.1.3 JowaiRoad:

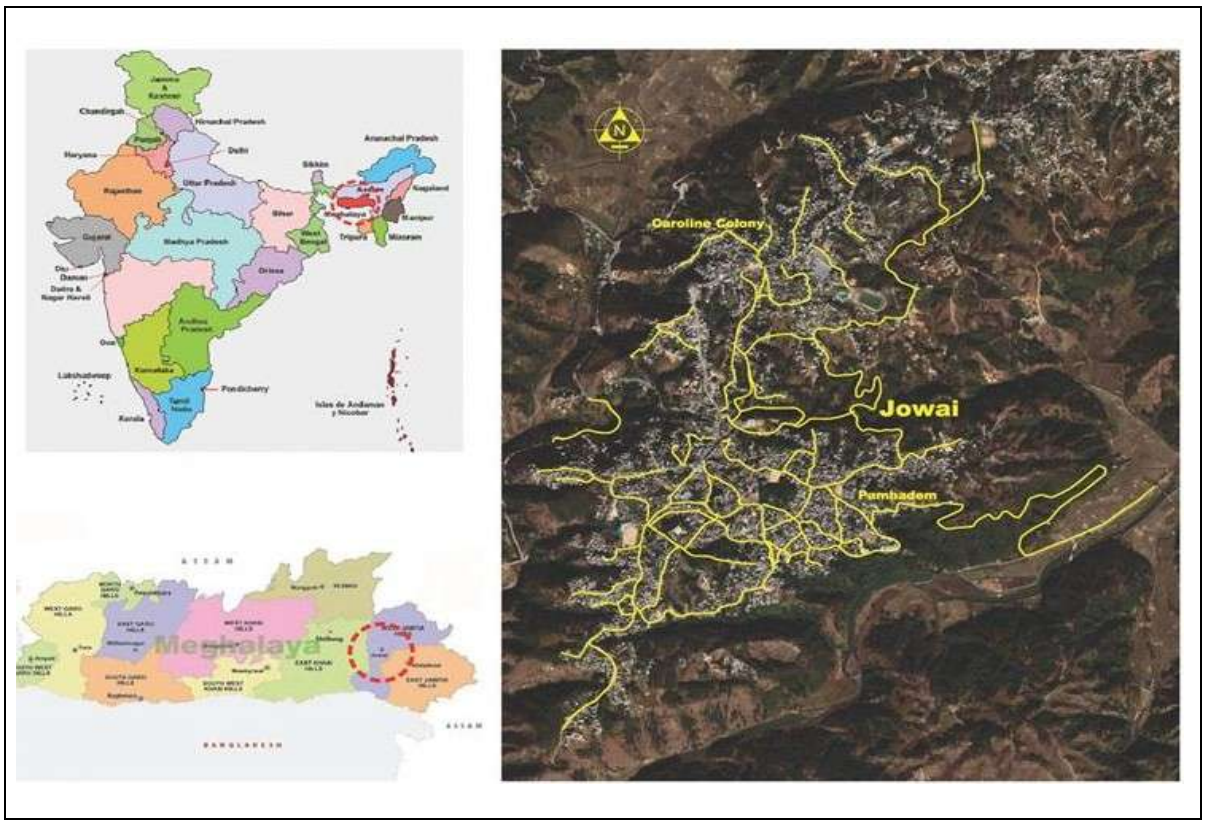
- Jowai Road section has a length of 33.973 km in the district Ri-Bhoi of Meghalaya state.
- It connects built up areas like Nongiri, Rilong, Sohpdok, Sohliya, Umtangngi, Mawdiengngan, Umlaiteng, Umlatar, Mawhati, Umsohlait, Sonidan and Mawlaho etc.
- The project road passes through hilly and rolling terrains.

1.2 Project Location

Jowai is a Municipality city in district of West Jaintia Hills of Meghalaya. It is situated 64 km away from the state capital Shillong. It serves as district headquarters and is an important business and education hub for the entire district. As per 2011 India census, Jowai had a population of 28,430. Climate of Jowai is pleasant, neither too hot in summers nor too cold in winters. The rain profile is very high during the south west monsoon. During the last few years, the intensity of rainfall in the district has registered a rising trend. The district's most popular modes of transport are Maruti, Alto and private Taxi. In absence of any Rail or Air links, Roads are the only lifeline for Jowai.

The Project Roads for the Jowai Town are shown in the following

Figure 1. 1. Location Map of the Jowai Town Roads



Start and End Point of Riatsasiam to ShillongJowai Road and Ummuiang from Tpep-pale Road

Start Point of Riatsasiam to Shillong Jowai road connecting NH-40E with NH-44

End Point of Riatsasiam to Shillong Jowai road connecting NH-40E with NH-44

Start point of approach road to Ummuiang from Tpep-Pale

End point of approach road to Ummuiang from Tpep-Pale

1.3 Right of Way (RoW)

The average carriageway width of the existing road varies from 2.85 to 6.6 meter. As the project involves only overlay in the existing road, no additional RoW required for the project. The improvement will be carried out within the existing ROW

1.4 Proposed Land Acquisition

As the Proposed improvement is well within the existing Right of Way, so there is no additional land is required for the project.

1.5 Pavement Condition

The summary of the visual pavement condition survey (carried out in October 2021) of the project roads are given below:

Table 1.1Pavement Condition

Sl.No.	Name	Pavement Type	Overall Visual Conditions in terms of Good, Fair, Poor and Very Poor	Road Distresses	Overall Road Width (m)	Remarks

Sl.No.	Name	Pavement Type	Overall Visual Conditions in terms of Good, Fair, Poor and Very Poor	Road Distresses	Overall Road Width (m)	Remarks
1	Lulong College Road	Bituminous	Poor	Ravelledsurface,Lotsofpotholes, Cracking, Undulations etc.	3.50	-
2	Mission Hospital to Lulong College Road	Bituminous	Fair	Ravelled surface,4 Potholes, 5 Patches, Cracking, Undulations etc.	3.50	-
3	Approach Road to Mission Hospital	Bituminous	Fair	Ravelled surface,3 Potholes, 3 Patches, Cracking, Undulations etc.	3.50	Hospital Road
4	Lulong College to LutiLongshylla	Bituminous	Poor	Ravelled surface, Lots of potholes, Cracking, Undulations etc.	3.10	
5	Approach Road to Pakyntein Caroline Colony	Bituminous	Poor	Ravelled surface, Lots of potholes, Cracking, Undulations etc.	4.20	Very Congeste d Area
6	Ladthalaboh to Khliehmulein	Bituminous	Poor	Ravelled surface, Lots of potholes, Cracking, Undulations etc.	3.60	Very Congested Area
7	KynrudSaphlang to JBRC road	Bituminous	Poor	Ravelled surface, Lots of potholes, Cracking, Undulations etc.	3.20	Very Congested Area
8	KynrudSaphlang to Khliehumkor road	Bituminous	Fair	Ravelled surface, 2 potholes, Cracking, Undulations etc.	3.20	Very Congested Area
9	Ladthalaboh to Lulong College Road	Bituminous	Poor	Ravelled surface, Lots of potholes, Cracking, Undulations etc.	3.30	Very Congested Area
10	Extension of Ladthalaboh to Lulong College Road	Bituminous	Poor	Ravelled surface, Lots of potholes, Cracking, Undulations etc.	3.30	Very Congested Area
11	KynrudSaphlang to Tpep-pale including Main Road	Bituminous	Poor	Ravelled surface, Lots of potholes, Cracking, Undulations etc.	3.30	Very Congested Area
12	KynrudSaphlang to Tpep-pale ; Branch road-1 to Lawmusiang	Bituminous	Poor	Ravelled surface, Lots of potholes, Cracking, Undulations etc.	3.30	Very Congested Area
13	KynrudSaphlang to Tpep-pale ;Branch road-2 to Lawmusiang	Bituminous	Poor	Ravelled surface, Lots of potholes, Cracking, Undulations etc.	3.25	Very Congested Area
14	Ladthalaboh to Kynrudsaphlang Road	Bituminous	Poor	Ravelled surface, Lots of potholes, Cracking, Undulations etc.	6.50	Heavy Traffic
15	Approach to Circuit House	Bituminous	Poor	Ravelled surface, Lots of potholes, Cracking, Undulations etc.	3.20	Very Congested Area
16	Road from Thluwania to meet Approach to Circuit House	Bituminous	Poor	Ravelled surface, Lots of potholes, Cracking, Undulations, Edge Brakes, etc.	3.20	VeryConges ted Area
17	Approach Road to Jail Complex	Bituminous	Poor	Ravelled surface, Lots of potholes, Cracking, Undulations etc.	3.30	Jail Road

Sl.No.	Name	Pavement Type	Overall Visual Conditions in terms of Good, Fair, Poor and Very Poor	Road Distresses	Overall Road Width (m)	Remarks
18	Approach Road from JBRC road to Tyndo-Wapung	Bituminous	Poor	Ravelled surface, Lots of potholes, Cracking, Undulations, Edge Brakes, etc.	3.30	-
19	Approach road from JBRC road to Studium	Bituminous	Poor	Ravelled surface, Lots of potholes, Cracking, Undulations etc.	3.30	Very Congested Area
20	Approach road from JBRC road to Mookyrdup	Bituminous	Poor	Ravelled surface, Lots of potholes, Cracking, Undulations, Edge Brakes, etc.	3.20	Very Congested Area
21	Approach road from JBRC road to Lumpariat	Bituminous	Poor	Ravelled surface, Lots of potholes, Cracking, Undulations etc.	3.70	Very Congested Area
22	Approach road to Mookyrdup to meet Lulong College Road	Bituminous	Fair	Ravelled surface, 8 potholes, Cracking, Undulations etc.	3.30	Very Congested Area
23	Mission Compound to Civil Hospital Road	Bituminous	Fair	Ravelled surface, Lots of potholes, Cracking, Undulations etc.	Km. 0+000 to 0+200 (6.00); Km. 0+200 to 0+650 (4.20); Km. 0+650 to 0+969 (3.40)	Very Congested Area
24	Approach road to Lumiongkjam	Bituminous	Poor	Ravelled surface, Lots of potholes, Cracking, Undulations etc.	3.30	Very Congested Area
25	IongpiahPohdaikhoo to Civil Hospital via Panaliar	Bituminous	Poor	Ravelled surface, Lots of potholes, Cracking, Undulations etc.	3.40	Very Congested Area
26	Kiang Nangbah Road	Bituminous	Poor	Ravelled surface, Lots of potholes, Cracking, Undulations etc.	3.40	Very Congested Area
27	Dulong Iongpiah Road	Bituminous	Fair	Ravelled surface, 3 potholes, Cracking, Undulations etc.	3.10	Very Congested Area
28	Approach road to Ummuiang from Tpep-Pale	Bituminous	Poor	Ravelled surface, Lots of potholes, Cracking, Undulations etc.	Km. 0+000 to 0+120 (3.40); Km. 0+120 to 0+550 (3.10)	Very Congested Area
29	Shri M.Pariat to Ummuiang	Bituminous	Poor	Ravelled surface, Lots of potholes, Cracking, Undulations etc.	3.20	Very Congested Area
30	Lulong to Panaliar Road	Bituminous	Poor	Ravelled surface, Lots of potholes, Cracking, Undulations etc.	3.30	Very Congested Area
31	Meghalaya Studio to Chutwakhu	Bituminous	Poor	Ravelled surface, Lots of potholes, Cracking,	3.20	Very Congested

Sl.No.	Name	Pavement Type	Overall Visual Conditions in terms of Good, Fair, Poor and Very Poor	Road Distresses	Overall Road Width (m)	Remarks
				Undulations etc.		Area
32	Approach road to Mynthong Presbyterian Church	Bituminous	Poor	Ravelled surface, Lots of potholes, Cracking, Undulations etc.	3.20	Very Congested Area
33	D.C. Court to Jrisalein	Bituminous	Poor	Ravelled surface, Lots of potholes, Cracking, Undulations etc.	7.10 except both side footpath 1.50 m	Heavy Traffic
34	MynthongPohkseh Road	Bituminous	Poor - Fair	Ravelled surface, Lots of potholes, Cracking, Undulations etc.	3.10	Very Congested Area
35	MynthongPohkseh Road Branch	Bituminous	Poor	Ravelled surface, Lots of potholes, Cracking, Undulations etc.	3.10	Very Congested Area
36	Mission Compound to Chutwakhu Road	Bituminous	Poor	Ravelled surface, Lots of potholes, Cracking, Undulations etc.	3.30	Very Congested Area
37	Iawmusiang to Mission Compound	Bituminous	Poor	Ravelled surface, Lots of potholes, Cracking, Undulations etc.	Km. 0+000 to 0+220 (5.70); Km. 0+220 to 0+340 (4.10) and Km. 0+340 to 0+500 (6.20)	
38	LarsingKhyriem road	Bituminous	Poor	Ravelled surface, Lots of potholes, Cracking, Undulations etc.	Km. 0+000 to 0+380 (6.80) Km. 0+380 to 0+650 (4.10)	
39	Chutwakhu to Lumkyrwiang	Bituminous	Poor	Ravelled surface, Lots of potholes, Cracking, Undulations etc.	3.40	Very Congested Area
40	Ummakah-Aitnar Road	Bituminous	Poor	Ravelled surface, Lots of potholes, Cracking, Undulations etc.	3.50	Very Congested Area
41	IongpiahAitnar Road	Bituminous	Fair	Ravelled surface, Cracking, Undulated type surface, Patching etc.	3.00	Very Congested Area
42	KhimusniangUmshangiar Road	Bituminous	Poor	Ravelled surface, Lots of potholes, Cracking, Undulations etc.	3.40	Very Congested Area
43	IongpiahLumkyrwiang Road	Bituminous	Poor	Ravelled surface, Lots of potholes, Cracking, Undulations etc.	2.90	Very Congested Area
44	H.Lytan to Govt.Boy HSS Road	Bituminous	Poor	Ravelled surface, Lots of potholes, Cracking, Undulations etc.	3.30	Very Congested Area
45	Civil Hospital to LutiLongshylla	Bituminous	Poor	Ravelled surface, Lots of potholes, Cracking, Undulations etc.	3.50	Heavy Traffic
46	Approach road to Kiang Nangbahmonument	Bituminous	Poor	Ravelled surface, Lots of potholes, Cracking, Undulations etc.	3.30	Heavy Traffic

Sl.No.	Name	Pavement Type	Overall Visual Conditions in terms of Good, Fair, Poor and Very Poor	Road Distresses	Overall Road Width (m)	Remarks
47	JrisaleinKhliehlangsha road	Bituminous	Poor	Ravelled surface, Lots of potholes, Patches, Cracking, Undulations etc.	8.00	Heavy Traffic
48	From the House of O.H.Shullai to meet Khimmusniang Umshangiar road	Bituminous	Poor	Ravelled surface, Lots of potholes, Cracking, Undulations etc.	3.30	Very Congested Area
49	JrisaleinKhliehshnong	Bituminous	Poor	Ravelled surface, Lots of potholes, Cracking, Undulations etc.	Km. 0+000 to 0+200 (4.00); Km. 0+200 to 0+635 (3.50)	Very Congested Area
50	Approach road to KhimusniangL.P.School	Bituminous	Poor	Ravelled surface, Lots of potholes, Patching, Cracking, Undulations etc.	5.00	Very Congested Area
51	Approach road to MEECL	Bituminous	Poor	Ravelled surface, Lots of potholes, Patching, Cracking, Undulations etc.	3.20	Very Congested Area
52	Riatsasiam to ShillongJowai road connecting NH-40E with NH-44	Bituminous	Poor	Ravelled surface, Lots of potholes, Cracking, Undulations etc.	3.50	Hevy Traffic
53	Approach to Khimusniang to Crematorium	Bituminous	Poor	Ravelled surface, Lots of potholes, Patching, Cracking, Undulations etc.	3.00	Very Congested Area
54	KhimusniangInternal road (opposite Khimusniang Presbyterian Church)	Bituminous	Poor	Ravelled surface, Lots of potholes, Patching, Cracking, Undulations etc.	3.20	Very Congested Area
55	Branch of KhimusniangInternal road (opposite Khimusniang Presbyterian Church)	Bituminous	Poor	Ravelled surface, Lots of potholes, Cracking, Undulations etc.	3.20	Very Congested Area
56	NH-40 E junction towards S.P.Office	Bituminous	Poor	Ravelled surface, Lots of potholes, Cracking, Undulations etc.	3.30	Very Congested Area
57	Road from D.C. Office to Taxi Stand at Iawmusiang	Bituminous	Poor	Ravelled surface, Lots of potholes, Cracking, Undulations etc.	3.30	Very Congested Area
58	LarsingKhyriemrd to meet NH40E	Bituminous	Poor	Ravelled surface, Lots of potholes, Cracking, Undulations etc.	3.20	-

1.6 Objective of the Project:

Project aims to improve transport efficiency of the state road network, which will contribute to expansion of economic opportunities and poverty reduction. This will be realized by

(i) improving the state highway network,

(ii) facilitating safe and appropriate road usage,

(iii) increasing efficiency of transport services and (iv) Enhancing GoM capacity for road asset development

Project immediate outcome will be improved accessibility to social services and markets, increased fuel efficiency, reduced travel time, accidents, vehicle emissions and better employment opportunities outside agriculture, both through improved access to economic centers and increased industrial activities in the project area.

1.7 Scope of the Project:

The proposed subprojects are part of Meghalaya Integrated Transport Program (MITP) for which the Environmental and Social Safeguard Management Framework (ESMF) has been prepared and disclosed at the websites of MIDFC and the World Bank. It is also noted that in specific to the rural roads the ESMF guidelines delineated under PMGSY RRP II (P165402) and subsequently revised for Additional Finance in 2018 to be followed.

- Preparation of application and supplementary reports (survey and preparation) as required for obtaining project's clearances like forest /environmental/wildlife clearances, if applicable, and presentation before expert panel committees of MoEF&CC, Govt. of India.
- Undertake the given special and additional assessments as applicable.
- Scientific and expert judgement for adding or skipping any element of assessment was apply
- Preparation of screening report for all the subprojects and Scope of Work (SoW) was define for the detail assessment if required.
- Screening report wasinclude the Environment and Social Management Plans, Health and Safety Plans including COVID 19 management plans, Stakeholder Engagement Plan, Public Disclosure, Grievance Redressal Mechanism and Resettlement Action Plan if required.
- It wasconsider but not be limited to the following:
  a) Conduct a comprehensive Environmental and Social Screeningfor all the subprojects.
  b) Establishing an environmental baseline for the project area.
  c) Conduct detailed Environmental and Social Impact Assessment (ESIA)only for those subprojects against which need for detailed assessment has been recommended as an outcome of Screening Activity.
  d) Integration of ESIA findings and ESMP budget in engineering feasibility studies.
  e) Preparation of any Environmental and Social Management Plan (ESMP), Health and Safety Plans including COVID 19 management plan, Resettlement Action Plan (RAP), Tribal (Indigenous) Development Plan (TDP), Gender Action Plan; Labor Management Procedure and Stakeholder Engagement Plan (SEP) etc.
  f) Preparation of application and supplementary reports (survey and preparation) required per local regulatory requirements for obtaining project’s clearances like forest/environmental/wildlife clearances, if applicable, and presentation before expert panel committees of MoEF&CC, Govt. of India.

g) Conduct consultations with identified stakeholders and project-affected parties /communityfrom early project planning and design stages of the assignment.

h) Develop monitoring programme to ensure that the proposed mitigation measures are being implemented effectively.

Table 1.2Project Salient Features

Sl. No.	Name of the Road	Carriage Width	No. of Curves	Radius	
				Max	Min
1	Lulong College Road	3.75	175	180	1.3
2	Approach road from JBRC road to Lumpariat	3.5	14	200	15
3	Approach road from JBRC road to Mookyrdup	3.25	7	150	5
4	Approach road from JBRC road to Studium	3.6	12	150	10
5	Approach Road from JBRC road to Tyndo-Wapung	3.4	13	120	5
6	Approach Road to Jail Complex	3.1	8	180	5
7	Approach road to KhimusniangL.P.School	3.3	9	180	10
8	Approach road to Kiang Nangbah monument	3.75	9	240	4
9	Approach road to Lumiongkjam	3.3	4	45	3
10	Approach road to MEECL	3.3	8	25	2
11	Approach Road to Mission Hospital	4	8	75	3
12	Approach road to Mookyrdup to meet LulongCollege road	3.7	18	80	4
13	Approach road to Mynthong Presbyterian Church	2.9	5	180	8
14	Approach Road to Pakyntein Caroline Colony	3.5	14	200	4
15	Approach road to Ummuiang from Tpep-Pale	3	13	60	2
16	Approach to Circuit House	3.1	15	160	3
17	Approach to Khimusniang to Crematorium	3.6	6	80	2
18	Chutwakhu to Lumkyrwiang	3.8	18	100	4
19	Civil Hospital to LutiLongshylla	3.75	95	160	4
20	D.C. Court to Jrisalein	5.3	8	240	15
21	Dulong Iongpiah Road	4	4	130	8
22	Extension of Ladthalaboh to Lulong College Road	3.75	16	50	2.5
23	From the House of O.H.Shullai to meet KhimmusniangUmshangiar road	3.75	20	120	4.5
24	H.Lytan to Govt.Boy HSS Road	3	12	40	15
25	Iawmusiang to Mission Compound	4.5	10	35	12
26	IongpiahAitnar Road	3.5	4	100	20
27	IongpiahLumkyrwiang Road	3	6	55	15
28	IongpiahPohdaikhoo to Civil Hospital via Panaliar	3.6	18	45	2
29	JrisaleinKhliehlangsha road	4.8	40	180	3.5
30	JrisaleinKhliehshnong	3.75	12	240	5
31	KhimusniangInternal road (opposite Khimusniang Presbyterian Church)	4	2.5	55	3
32	KhimusniangUmshangiar Road	3.75	45	240	4
33	Kiang Nangbah Road	4.4	33	130	3
34	KynrudSaphlang to JBRC road	3.75	5	75	5
35	KynrudSaphlang to Khliehumkor road	3.6	1	180	180
36	KynrudSaphlang to T pep-pale ;Branch road-1 to Lawmusiang	6.6	2	20	10
37	KynrudSaphlang to T pep-pale ;Branch road-2 to Lawmusiang	5.2	19	30	3
38	KynrudSaphlang to Tpep-pale including Main road	5.6	35	360	5
39	Ladthalaboh to Khliehmulein	4	15	190	3
40	Ladthalaboh to Kynrudsaphlang Road	5.4	25	250	8
41	Ladthalaboh to Lulong College Road	4	15	75	3
42	LarsingKhyriem road	5	20	500	5
43	Lulong College to LutiLongshylla	3	18	120	2.5
44	Lulong to Panaliar Road	3.6	10	80	15
45	Meghalaya Studio to Chutwakhu	2.9	7	300	2.5
46	Mission Compound to Chutwakhu Road	4	12	130	3.5
47	Mission Compound to Civil Hospital Road	4.2	43	80	4.5
48	Mission Hospital to Lulong College Road	3.5	10	180	7
49	MynthongPohkseh Road	3.5	17	240	1.5
50	MynthongPohkseh Road Branch	2.85	12	90	7
51	Riatsasiam to ShillongJowai road connecting NH-40E with NH-44	5.3	26	180	7
52	Road from Thluwania to meet Approach to Circuit House	3.35	4	150	20
53	Shri M.Pariat to Ummuiang	3.35	4	75	4
54	Ummakah-Aitnar Road	3.75	8	100	10

1.8 STRUCTURE OF ESIA REPORT

As per the EIA notification of the MOEF on dated 14 September 2006 & subsequent amendments, the generic structure for the ESIA report shall consist of the following chapters:

The ESIA report for the project road has been prepared complying country regulations and The World Bank Guidelines for Environmental Assessment. The report has been structured in the following Chapters:

Chapter -I: Introduction and Project Background

Chapter -II: Need of Environment & Social Impact Assessment

Chapter -III: Legal Framework

Chapter -IV: Description of Environment

Chapter -V: Analysis of Potential Environmental & Social Impacts & Mitigation- Measures

Chapter -VI: Environmental Monitoring Program

Chapter -VII: Additional Studies

Chapter -VIII: Resettlement Action Plan

Chapter -IX: Monitoring and Evaluation

Chapter -X: Abbreviated Resettlement Action Plan

Chapter -XI: Project Benefits

Chapter -XII: Environment and Social Management Plan

Chapter -XIII: Conclusions & Recommendations

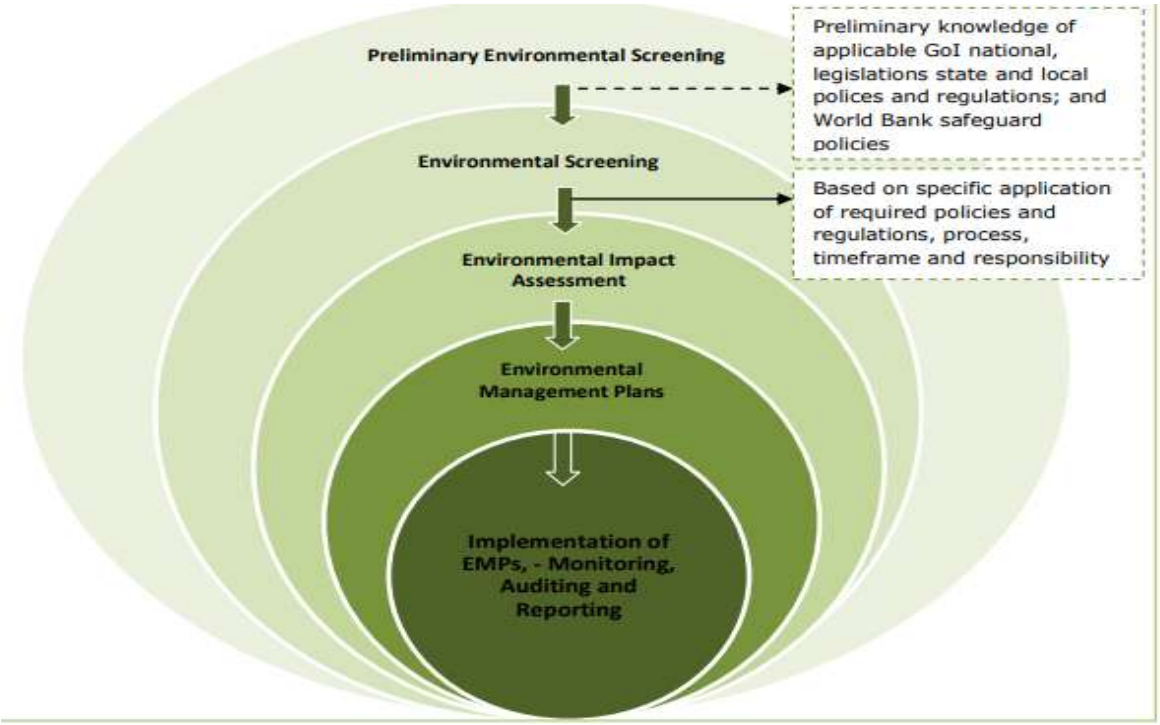
2 CHAPTER-II: NEED OF ENVIRONMENT & SOCIAL IMPACT ASSESSMENT

The project road has been assigned category “B” in accordance with World Bank’s Operational Policy OP 4.01 (Environmental Assessment) and mandate the preparation of project-specific Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP). Similarly, in accordance with World Bank’s Operational Policy OP 4.12 (Involuntary Resettlement), this project mandates the preparation of the Social Impact Assessment (SIA) and Resettlement Action Plan (RAP). Accordingly, detailed assessments of the environmental and social impacts have been carried out following a suitable methodology.

This ESIA shall cover, the environmental and social impacts due to the project, concerning construction-related environmental impacts, infringements with natural habitats and places of cultural heritage also in the context of ‘chance-find’, and impacts on local population/ community. The findings of ESIA will guide the effective development of the specific ESMP and facilitate the implementation of safeguard measures appropriately.

The approach followed for conducting ESIA study of the Project. To identify the environmental and social issues arising out of the current practices adopted for planning, design, and construction of the project roads, the environmental and social conditions along the project roads were assessed. During these visits, consultations through group discussions with local communities, road users and panchayat/ village members were contacted to understand their

perceptions and needs. A standard methodology was adopted for fulfilling the ESIA requirements; key features/tasks of the methodology are detailed as follows:



Task 1: Field Reconnaissance Survey and Review of Earlier Studies The field reconnaissance survey has been carried out along the project roads to understand salient environmental and social features that are likely to cause adverse impacts, sensitive environmental and social issues via-a-vis proposed project interventions. The salient feature includes The topography of the land, road geometry Environmental features like trees, any forest area, water bodies like ponds, rivers, etc. A social and physical feature like settlement pattern, its density, typology of buildings, especially the presence of religious buildings, land use, etc.

Task 2: Review and Assessment of Applicable Environmental and Social Regulations Various rules/regulations and guidelines applicable to the project roads vis-à-vis center (GoI), state (GoM) and World Bank statutory requirements were reviewed and referred to for assessing current environmental and social impacts that are likely to emanate.

Task 3: Delineation of Study Area for Assessment

In road projects, while the influence area may vary via-a-vis size of the road, location of the road, type of road, etc., hence, the study area was fixed based on the proposed interventions including the road sections undergoing widening and strengthening, RoW availability, structural works (culverts and bridges), presence of sensitive areas, etc. In addition to this, the project influence area (10 km buffer from the center line on either sides) for impact assessment is also considered in those areas that are directly or indirectly influenced by the project activities during construction or operation of the proposed road work such as Hot Mix plants, sand quarries, source of raw material and material transport, etc.

Task 4: Assessment of Baseline Environmental and Social Conditions This task comprises a collection of baseline data for the project road locations primarily on physical, biological and socio-economic conditions. The secondary source of information was utilised for giving a

generic snapshot of socio environment features. In addition, existing environmental and social quality/features along the project roads were assessed based on a walk-through survey, public consultations, FGD's and discussions with line department officials.

Task 5: Public Consultations/Focus Group Discussions To cover a wide range of stakeholders in the study area, corner meetings were conducted at selected places with women groups, men and road users to understand the people's perception about the project as well as their issues and concerns. Overall project features, social safeguards, issues related to women's safety and security, environmental safeguards, and enhancement measures would be implemented in the project was also discussed with the public.

Task 6: Prediction of Environmental and Social Impacts The task identified likely impacts that would arise due to the construction of project roads, through changes in the physical, biological or socio-economic environment. The assessment considered both positive and negative impacts at different stages of implementation, i.e., pre-construction, construction and operation stages of the project roads.

Task 7: Preparation of Environment and Social Management Plan (ESMP) A comprehensive Environmental and Social Management Plan (ESMP) was prepared which included mitigation measures for all the negative impacts of sub-projects and enhancement measures for positive impacts.

Task 8: Preparation of Resettlement Action Plan (RAP) Based on the updated DPR there will be no Land Acquisition and all improvements are well withing the existing RoW, which is free from all encroachments and encumbrances. Thus, as per the World Bank norms only ESIA shall be prepared to specify the procedures it will follow and the actions it will take to properly resettle/compensate affected people and communities. There will no requirements of ARAP or RAP.

Task 9: Preparation of Environmental and Social Management Budget

Based on the impact assessment for the environmental and social components a suitable budget has been estimated to compensate for the temporary and permanent impacts that are likely during the project implementation. As part of the project implementation monitoring, budgetary provision has been allotted for ESIA implementation and environmental monitoring. The budget also includes compensatory afforestation measures for the loss of avenue trees due to road widening.

Task 10: Environmental Safeguard Clauses in the Bid Document

Suitable safeguard clauses have been prepared based on the ESIA, the prepared clauses shall form part of the bid document either in the General condition or Specific conditions of the contract agreement/ bid document. The prepared ESMP shall also be part of the bid document.

3 CHAPTER: III- LEGAL FRAMEWORK

The Ministry of Environment, Forest & Climate Change made it mandatory for introducing environment assessment into the planning process of road projects as well as environmental impact appraisal as per Environmental Protection Act, 1986. The MoEFCC have assigned all central and State authorities to develop policies towards protection of environment for any infrastructure development activities as per the act. The Ministry of Environment, Forest & Climate Change (MoEFCC) has overall authority for the administration and implementation of government policies, laws and regulations. In the present project the environment acts, policy guidelines of both State and Central Government will be applicable. As these acts/regulations have varying procedures, requirements depending on type of project, a detailed discussion is required in this report to study the extent of applicability, procedures and requirements to be met by the implementing authorities. The following subsections summarized the legislative framework in which the present project will be addressed with respect to the environment including social issues.

3.1 Institutional Setting

The primary responsibility of administration and implementation of the Government of India's policy with respect to environmental management, conservation, ecologically sustainable development, and pollution control rests with the Ministry of Environment, Forest & Climate Change (MoEF& CC). The MoEF& CC has a number of agencies and institutions to implement the environmental policies. Such as: Central Pollution Control Board (CPCB), MoEF& CC Regional Offices, State Pollution Control Board (SPCB) & State Department of Environment & Forests.

3.2 Acts & Regulation

The Government of India has laid down various policy guidelines, regulations, acts and legislations pertaining to sustenance of environment. The following table shows the relevant environmental legislations and implementing agencies.

Table 3.1: Applicable Acts & Regulations

Sl. No.	Act/Regulations	Main Objective	Implementation Agency
1.	Air (Prevention and Controlof Pollution) Act, 1981	To control and monitor air quality as per prescribed limits	State Pollution Control Board.
2.	The Water (Prevention and Control of Pollution) Act, 1974	To control and monitor water pollution as per prescribed limits	State Pollution Control Board.
3.	Indian Motor Vehicles Act, 1988	To check vehicles for air and noise pollution	Motor Vehicles Department, Govt. of Meghalaya.
4.	The Forest Conservation Act, 1980	To check deforestation	Forest Department GOI and Government of Meghalaya&MoEF& CC
5.	National Forest Policy, 1988	To preserve and restore	Forest Department.

Sl. No.	Act/Regulations	Main Objective	Implementation Agency
		biological diversity	
6.	Wild Life (Protection) Act, 1972	To protect and improve the overall wild life	Chief Conservator wild life, Forest Department, Meghalaya.
7.	Environment Protection Act, 1986	To protect and improve the overall environment	Dept. of Environment and Forest, Meghalaya.
8.	Ancient Monuments and Archaeological Sites and Remains Act, 1958	Preservation of culture and historical remains	Indian Heritage Society, and Indian National Trust for Art and Culture Heritage
9.	EIA Notification, September 14, 2006	For all Development Projects	Ministry of Environment, Forest & Climate Change (MoEF& CC)
10.	National Environmental Appellate Authority Act, 1997	For Grievance Redress	Ministry of Environment, Forest & Climate Change (MoEF& CC)
11.	Integrated Waste Management	Waste management and control.	Ministry of Environment, Forest & Climate Change (MoEF& CC) and State Pollution Control Board

3.3 Clearance Requirement

During the construction stage, some of the key statutory requirements that need to be obtained by the Contractor as part of mobilization have been listed in the table given below:

Table 3.2: Applicable Acts & Regulations (Construction Phase)

S. No.	Clearance Required for	Statute under which clearance is required	Statutory Authority
1	Hot mix plants, Crushers, Batch Mix Plants & DG Sets.	Air (Prevention and Control of Pollution) Act, 1981 and Noise Pollution (Regulation and Control) Rules, 2000	State Pollution Control Board
2	Storage, handling and transport of hazardous materials.	Hazardous Waste (Management and Handling) Rules, 1989 and Manufacturing, Storage and Import of Hazardous Chemicals Rules, 1989.	State Pollution Control Board
3	Location/ layout of workers camp, equipment and storage yards	Environment Protection Act, 1986 and Manufacturing, Storage and Import of Hazardous Chemicals Rules, 1989	State Pollution Control Board
4	Quarries (Aggregates, Sand & Earth)	Environment Protection Act, 1986	MoEF&CC

S. No.	Clearance Required for	Statute under which clearance is required	Statutory Authority
5	Permission for withdrawal of groundwater and for construction purpose.	Environment Protection Act, 1986	CGWB
6	Disposal of bituminous wastes	Hazardous Waste (Management and Handling) Rules, 1989	As per state norm/ Local Civic Body
7	Pollution Under Control Certificate	Central Motor and Vehicle Act 1988	Department of Transport, State Government.
8	Storage of fuel oil, lubricants, explosives, diesel etc. at construction camp.	Manufacture, storage and Import of Hazardous Chemical Rules 1989	State Pollution Control Board & PESO.

3.4 MORTH & IRC Specifications

All road works in India are to be in accordance with the MoRTH specifications for Road and Bridge works and guidelines of Indian Roads Congress (IRC). The MoRTH specifications have special provisions towards protection of environment under Clause 501, Annexure A and the contractor is to satisfy the provisions. Apart from the Annexure A to clause 501, there are provisions for control of erosion, drainage, dust suppression, borrow area and haul road management under relevant sections. Provisions of clause 501 Annexure A, cover the environmental aspects as:

3.5 Environmental Standards and Code of Practices

All the construction work will be carried out as per the Environment standards and guidelines of MoEFCC, CPCB & code of practices of IRC. Some of the codes used during the construction phase are listed below.

- Guidelines for use of Fly Ash in Road Embankments (IRC: SP: 58-2001)
- Guidelines for Environmental Impact Assessment of Highway Projects (IRC: 104-1988)
- Guidelines on Preparation and Implementation of Environment Management Plan (IRC SP 108-2015)
- Guidelines on Landscaping and Tree Plantation (IRC: SP-21-2009)
- Report containing recommendations of the IRC regional workshops on Highway Safety IRC: SP: 27-1984
- Recommended practice for Borrow pits for Road Embankments constructed by Manual operation IRC: 10-1961
- Road accident Forms IRC: 53-1982
- Guidelines for Use of Construction and Demolition Waste in Road Sector (IRC 121-2017)
- Proceedings of International Seminar on sustainable development in 8.10.2001
- Road Transport Highway Safety Code IRC: SP: 44-1996

- Guidelines on Safety in Road Construction Zones IRC: SP: 55:2001
- Guidelines on Skill Development of Workmen in Road Sector (IRC 127-2018)
- Guidelines of WB& ADB.

3.6 Other Applicable Policies (Social Security & Labor Welfare)

Environmental and labour welfare issues during the construction stage generally involve equity, safety and public health issues. The different applicable policies are:

Table 3.3: Applicable Policies

Applicable Codes	Concerns	Remarks
The Code on Social Security, 2020	It consolidated The Employees' Compensation Act, 1923, The Employees' State Insurance Act, 1948, The Employees' Provident Funds and Miscellaneous Provisions Act, 1952, The Employment Exchanges (Compulsory Notification of Vacancies) Act, 1959, The Maternity Benefit Act, 1961, The Payment of Gratuity Act, 1972, The Cine Workers Welfare Fund Act, 1981, The Building and Other Construction Workers Welfare Cess Act, 1996, Unorganised Workers' Social Security Act 2008,The Constitution (Eighty-Ninth Amendment) Act, 2003, Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006, PESA, Vishaka Guidelines, Equal Remuneration Act, 1976, The Child and Adolescent Labour (Prohibition and Regulation) Act, 1986, The Immoral Traffic (Prevention) Act, 1956, Sexual Harassment of Women at Workplace (prevention, Prohibition and Redressal) Act, 2013 and POSCO Act,2013	State Government, District Authorities, Ministry of labour and Employment
The Occupational Safety, Health and Working Conditions Code, 2020	It amalgamated The Factories Act, 1948, The Plantations Labour Act, 1951, The Mines Act, 1952, The Working Journalists and other Newspaper Employees (Conditions of Service and Miscellaneous Provisions) Act, 1955, The Working Journalists (Fixation of Rates of Wages) Act, 1958, The Motor Transport Workers Act, 1961, The Beedi and Cigar Workers (Conditions of Employment) Act, 1966, The Contract Labour (Regulation and Abolition) Act, 1970, The Sales Promotion Employees (Condition of Service) Act, 1976, The Inter-State Migrant workmen (Regulation of Employment and Conditions of Service) Act, 1979, The Cine Workers and Cinema Theatre Workers Act, 1981, The Dock Workers (Safety, Health and Welfare) Act, 1986 and The Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996.	Ministry of labour and Employment
The Code on Wages, 2019	It consolidated the provisions of four labour laws concerning wage and bonus payments and makes universal the provisions for minimum wages and timely payment of wages for all workers in India. The Code repeals and replaces the Payment of Wages Act, 1936, the Minimum Wages Act, 1948, the Payment of Bonus Act, 1965, and the Equal Remuneration Act, 1976.	Ministry of labour and Employment
Corporate Social Responsibility- Companies Act, 2013	Section 135 of the Companies Act introduces mandatory Corporate social responsibility (CSR) contributions for large companies, making it the only mandatory CSR law in the world. According to the bill, all firms with net worth above 5 billion rupees or	Ministry of Corporate Affairs

	□5 billion (approx. $75 million), turnover over 10 billion rupees or □ 10billion (approx. $150 million), or net profit over 50 million rupees or □ 50million (approx. $750,000) are required to spend at least 2% of their annual profits of the preceding year. The law requires that all businesses affected establish a CSR committee to oversee the spending.	

3.6.1 World Bank safeguard/ Operational policies

The World Bank policies and directives on environmental and social safeguards have adhered to the project roads. The applicability of the relevant policies of the project roads that are undergoing up-gradation (strengthening and widening) are summarized in the following table

Table 3.4: Applicable World Bank Operational policies

OP 4.01 Environmental Assessment	Help to ensure the environmental and social soundness and sustainability of investment projects. Support integration of environmental and social aspects of projects in the decision-making process
OP 4.04 Natural Habitats	Promote environmentally sustainable development by supporting the protection, conservation, maintenance, and rehabilitation of natural habitats and their functions.
OP 4.36 Forestry	Aims to harness the potential of forests to reduce poverty in a sustainable manner, integrate forests effectively for sustainable economic development and protect vital local and global environmental services and values of forests
OP 4.12 Involuntary Resettlement	Avoid or minimize involuntary resettlement and, where this is not feasible, assist displaced persons in improving or at least restoring their livelihoods and standards of living in real terms relative to pre-displacement levels or to levels prevailing before the beginning of project implementation, whichever is higher.
OP 4.10 Indigenous People	Design and implement projects in a way that fosters full respect for indigenous peoples' dignity, human rights, and cultural uniqueness so that they i. Receive culturally compatible social and economic benefits, and ii. Do not suffer adverse effects during the development process.
Physical Cultural Resources (PCR)	OP 4.11 Assist in preserving PCR and in avoiding their destruction or damage. PCR includes resources of archaeological, paleontological, historical, architectural, religious (including graveyards and burial sites), aesthetic, or other cultural significance.

Resettlement Policy Framework (RPF): Resettlement Policy Framework (RPF) consisting of national/state policies and the World Bank's operational policy on involuntary resettlement is being implemented in MITP The frameworks provide an overview of screening of the road-projects for social impacts, the process for social impact assessment, preparation of land plan schedules, entitlements for different impact categories, institutional arrangements, information disclosure and consultations and the preparation and implementation of Resettlement Plan (RP).

3.6.2 Applicable Legal Framework for Social

The legal framework and principles adopted for addressing resettlement issues in the Project have been guided by the proposed legislation and policies of the GOI, the state Government of Meghalaya, PWRD Meghalaya in accordance to World Bank's OP 4.12 for Involuntary Resettlement and OP 4.10 for Indigenous People. Prior to the preparation of the Resettlement Plan, a detailed analysis of the proposed national and state policies is to be undertaken and an entitlement matrix has to be prepared for the entire program. The section below provides details of the various national and state level legislations and their applicability. A summary of applicable acts and policies is presented in the following paragraphs.

3.6.3 Objectives of the Policy

The objectives of the Policy are as follows: -

- To minimize displacement and to identify non-displacing or least-displacing alternatives;
- To plan the resettlement and rehabilitation of Project Affected Families, (PAFs) including special needs of Tribal and vulnerable sections;
- To provide better standard of living to Aps.

3.6.4 Policy Framework for this Project

Based on the above analysis of applicable legal and policy frameworks of the country and in consistent with World Bank's policy requirements the broad resettlement principle for this project shall be the following:

Meaningful consultations with affected persons, host communities, and concerned non-government organizations were carried out and all affected persons were informed of their entitlements and resettlement options. DP's participation in planning, implementation, and monitoring and reporting of resettlement programs were ensured.

Particular attention were paid to the needs of vulnerable groups, especially those below the poverty line, the landless, the elderly, women and children, and Indigenous Peoples, and those without legal title to land, and ensure their participation in consultations.

The livelihoods of all Affected Persons were improved or at least restored through (i) land-based resettlement strategies when affected livelihoods are land based where possible or cash compensation at replacement value for land when the loss of land does not undermine livelihoods, (ii) prompt replacement of assets with access to assets of equal or higher value, (iii) prompt compensation at full replacement cost for assets that cannot be restored, and (iv) additional revenues and services through benefit sharing schemes where possible.

Physically and economically Affected Persons were provided with needed assistance, including (i) if there is relocation, secured tenure to relocation land, better housing at resettlement sites with comparable access to employment and production opportunities, integration of resettled persons economically and socially into their host communities, and extension of project benefits to host communities; (ii) Transportation support and development assistance, such as land development, credit facilities, training, or employment opportunities; and (iii) civic infrastructure and community services, as required.

Affected Persons without titles to land or any recognizable legal rights to land are ensured that they are eligible for resettlement assistance and compensation for loss of non-land assets.

A resettlement plan was prepared elaborating on Affected Persons' entitlements, the income and livelihood restoration strategy, institutional arrangements, monitoring and reporting framework, budget and time-bound implementation schedule.

The draft resettlement plan, including documentation of the consultation process were disclosed in a timely manner, before project appraisal, in an accessible place and in a form and language(s) understandable to affected persons and other stakeholders. The final resettlement plan and its updates was also be disclosed to affected persons and other stakeholders.

Involuntary resettlement is conceived and executed as part of a development project or program. Full costs of resettlement are included in the presentation of project's costs and benefits. For a project with significant involuntary resettlement impacts, consider implementing the involuntary resettlement component of the project as a stand-alone operation.

All compensation to be paid and other resettlement entitlements are to be provided before physical or economic displacement. The resettlement plan is to implemented under close supervision throughout project implementation.

Resettlement outcomes, their impacts on the standards of living of Affected Persons are monitored, it were accessed whether the objectives of the resettlement plan have been achieved by taking into account the baseline conditions and the results of resettlement monitoring. Monitoring reports are disclosed to DPs.

Land acquisitions for the project are done as per the RFCTLARR ACT, 2013 and Meghalaya RFCTLARR Rules, 2017. To meet the replacement cost of land payment of compensation in revised market rate.

All Common Property Resources (CPR) lost due to the project are replaced or compensated by the project.

The project recognize three types of Affected Persons like (i) persons with formal legal rights to land lost in its entirety or in part; (ii) persons who lost the land they occupy in its entirety or in part who have no formal legal rights to such land, but who have claims to such lands that are recognized or recognizable under national laws; and (iii) persons who lost the land they occupy in its entirety or in part who have neither formal legal rights nor recognized or recognizable claims to such land. The involuntary resettlement requirements apply to all three types of affected persons.

Cash compensation for properties belonging to the community if opted by the community, were provided to enable construction of the same at new places through the community/ local self-governing bodies / appropriate authority in accordance with the modalities determined by such bodies / authority to ensure correct use of the amount of compensation.

Compensation for trees is based on their market value. Loss of timber trees were compensated at their replacement cost while the compensation for the loss of fruit bearing trees were calculated as annual produce value for at next 15 years depending on the nature of crops/trees.

Table 3.5: Applicable Legal Framework for the entire Project

Sl.	Name of Act/ Rules	Purpose	Applicable/ Not Applicable	Description	Responsible Agency
1.	Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act -2013.	Fair compensation for (i) acquisition of land and other immovable assets; (ii) economic rehabilitation of all those who are affected due to land acquisition. The Act also covers the Lease Holders, Sharecroppers and Tenant.	Applicable	This Act is Applicable, as land acquisition was carried out and disbursement of compensation was made as per the Act.	Revenue Department under the respective project Districts of Meghalaya
2.	The Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act	Grants Legal recognition to the rights of traditional forest dwelling communities.	Applicable	This Act is Applicable as land acquisition has not affected the rights of forest dwelling schedule tribes & other traditional forest dwelling communities.	Ministry of Tribal Affairs, GoI and Department of Tribal Welfare of State Government

Sl.	Name of Act/ Rules	Purpose	Applicable/ Not Applicable	Description	Responsible Agency
3.	The Minimum Wage Act,1948	Payment of minimum rate of wages as fixed and periodically revised by the State Government	Applicable	Construction/daily wageworkers are involved and was involved in the project	District Labour Commissioner.
4.	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.	Applicable	The Insurance Policy covers the compensation, hospitalization and transportation of workers /employees	District Labour Commissioner
5.	Inter-state Migrant Workers Act, 1979	It protects workers whose services are requisitioned outside their native states in India. Contractor who employs or who employed five or more Inter-State migrant workmen need to obtain registration under this act	Applicable	Construction workers involved in the project may or may not be from the neighboring state. Presently the construction workers are from within the state of Meghalaya.	District Labour Commissioner/ Govt. Of Meghalaya
6.	The Child Labour (Prohibition & Regulation) Amendment Act, 2016	It prohibits employment of children in certain specified hazardous occupations and processes and regulates the working conditions in others.	Applicable	No Child worker should be involved in the project. it may be noted that no child labour is engaged in the project	District Labour Commissioner
7.	Building and Other Construction Workers Welfare Cess Act, 1996	An Act to provide for the levy and collection of a Cess on the cost of construction incurred by employers.	Applicable	Project involves employment of construction workers	District Labour Commissioner
8	The Sexual Harassment of Women at Workplace (Prevention, Prohibition, and Redressal) Act, 2013	Vishakha Guidelines are to be followed	Applicable	This act specially protects the rights of the women workers against any kinds of sexual harassment at the project, both at office and sites. The complaint register for sexual harassment is available at the site but no sexual incidence has been reported till date.	District Women Commission /Project Proponent
	Immoral	To be prevent	Applicable	The Act aims to mitigate	District Women

Sl.	Name of Act/ Rules	Purpose	Applicable/ Not Applicable	Description	Responsible Agency
	Traffic in Women and Girl Act, 1956 (as amended upto 1986) Act, 1956	trafficking of young women in disguise of job offers		violence against women and children by prohibiting trafficking and sexual exploitation for commercial use	Commission and Local and Order Authority
9	The Equal Remuneration Rules, 1976	Equal Remuneration for identical works	Applicable	Project has not discriminated between sex, race, caste or creed in payments to the employees	District Labour Commissioner
10	The Trade Union Act, 1926	Right to form Trade Union at the Workplace	Applicable	No trade union formed within the organization	District Labour Commissioner
11	Public Liability Insurance Act 1991	Provides immediate relief to the persons affected by accidents, occurring while handling any hazardous substance	Applicable	Project has been adhering to all the relevant provisions made under the act	District Labour Commissioner
12	World Bank OP/BP 4.12 – Involuntary Resettlement	The project was not involve land acquisition though, at a very low scale widening, realignments, junction improvements, bypasses etc might adversely affect non-titleholders structures used for various purposes, livelihood of people (mainly earning their livelihood by means of petty shops and providing various services).	Applicable	Many of them have been operating from the government land. Thus both title holders and non-title holders alike would be affected as a consequence of the project	PIU/Implementing Agency
13	Indigenous Peoples OP/BP 4.10	In the context of India Indigenous Peoples may be referred to "scheduled tribes". As per the Census of India, 2011 about 86% of the Meghalaya state belongs the Schedule Tribe. The population is distributed across 11 districts of Meghalaya.	Not Applicable	The policy on Indigenous People was not be triggered as the presence of tribal groups with close attachment to land in the project area is not established. Further, this policy is not triggered in terms of “collective attachment to geographically distinct habitats” and “institutions”.	PIU/Implementing Agency

Sl.	Name of Act/ Rules	Purpose	Applicable/ Not Applicable	Description	Responsible Agency
14	Bank Policy – Access to Information	The policy governs the public accessibility of information in the Bank's possession.	Applicable	The Bank allows access to any information in its possession that is not on a list of exceptions. Documents such as RPF, all ESIA and ARAPs was disclosed both by the borrower and Bank.	PIU/Implementing Agency

3.6.5 Social Categorization:

There are 8 identified sub-projects 4 are urban and 4 are rural. All activities under these sub-projects are limited to the available RoW, thus no land acquisition and resettlement and rehabilitation are envisioned for these activities. All the activities in the urban or rural projects will not impact the tribal population as it is limited to the existing land area already available. Further, "collective attachment to geographically distinct habitats" and "institutions that are separate from those of the dominant society and culture is not present in the project impact area. Thus, the World Bank OP 4.10 does not trigger for these projects. However, impacts on the livelihood of vendors, petty shopkeepers and likes cannot be fully avoided and thus need to be mitigated in accordance with the policies of the World Bank (OP 4.12).

As per World Bank's guidelines of Categorization for Involuntary Resettlement, this sub-project is categorized as Category C as there is no permanently impacted PAPs in the sub-projects. Thus, an ESIA is prepared on the possible impacts identified and measured in SIA and mitigation measures as provisioned in the Entitlement Matrix of the Resettlement Framework and is as per the Guideline and Template of ESMF. The ESIA is disclosed and implemented in the project and the compensation and R&R assistances will be released to the displaced families before the Civil Construction starts.

As per World Bank's guidelines of Categorization for Indigenous People Impact this sub-project is categorized as Category C. As per the guidelines no specific action is required, still the mitigation methods are reflected in the related plans such as an ESMP.

4 CHAPTER: IV- DESCRIPTION OF ENVIRONMENT

The present chapter describes the baseline environmental conditions of the project road. It comprises both secondary information as well as primary information collected through baseline studies, data collection and field surveys.

Details of the baseline environmental parameters are required for decision making for the project design, implementation and operation from the environmental point of views. The data has been collected from the primary surveys and secondary sources. It is essential to establish the base line environmental status of the physical, natural and socio-cultural environmental parameters along the project roads and within the project influence area of 10 Kms.

The baseline condition describes the state of the existing environment before the onset of the proposed development work. The collection of baseline information on biophysical, social and economic aspects of the project area is the most important reference for conducting Environmental Screening and Preliminary Environmental and Social Impact Assessment study. The description of existing environment includes the characteristic of area in which the activity of the project road would occur and cover area affected by all impacts. The existing baseline conditions have been analyzed based on secondary information/data collection with regard to air quality, water quality, noise, soil, ecology & biodiversity and socio- economic aspects and secondary data/information collection from published authentic sources and various government agencies. Efforts have been made to collect the latest information both at regional as well as local level especially along the project roads alignment. The existing baseline data and analysis around the project road covering both districts are presented in the following sections.

Scope of the ESIA/ESMP Study

The scopes of the ESIA/ESMP study are: -

- Baseline status of environmental parameters.
- Identification of the potential impacts during pre-construction, construction and operation phases.
- Developing mitigative measures to sustain and maintain the environmental scenario.
- Providing compensatory developments wherever necessary, including plans for highway side tree plantation.
- Preparation of Environmental Management and Monitoring Plan.
- Screening, scoping and consultations with public, experts in various fields, non-government organization (NGOs) etc.
- Review of policies and legal framework.

The area of direct influence is confined in a linear fashion along the corridor, where the construction activities take place. The area of direct influence of 1 Km on either side of PRoW has been considered. Secondary data have been collected within 10 km aerial distances.

About Jowai Town: West Jaintia Hills District is one of the 11 (eleven) districts of the state of Meghalaya. With the bifurcation of the erstwhile Jaintia Hills District into East and West Jaintia Hills District, West Jaintia Hills District came into existence on 31st July 2012 with its Head Quarter at Jowai. Jowai is the host of all the heads of important governmental offices and establishments, educational institutions, hospitals, banking institutions, etc.

The total area of the district is 1693 Sq.kms. The district comprises of 1(one) Civil Sub-Division Viz. Amlarem Civil Sub-Division and 3(three) Community and Rural Development Blocks viz. Amlarem C&RD Block, Laskein C&RD Block and Thadlaskein C&RD Block with the following boundaries: -

North– Assam South – Bangladesh and East Jaintia Hills District East – Assam West – East Khasi Hills District

Jowai is an important business and education hub for the entire district, catering to local students as well as those from the adjacent parts of Assam and Bangladesh. It is well equipped with infrastructure including schools, colleges, hospitals, and a postal service. As with the Nongphlang (Khynriams), Pnarstoo have a matriarchal society where daughters inherit the family property.

Meteorology:

Jowai is the headquarters of the West Jaintia Hills district of the state of Meghalaya, India, and is home to the Pnar, a sub-tribe of the Khasi people. It is located on a plateau surrounded on three sides by the Myntdu river bordering Bangladesh to the south (about 50 km from the Indo-Bangladesh border). Due to its high altitude of 1365 m above sea level, Jowai experiences warm summers with cool to chilly winters.

Three seasons observed in the Jowai town, are written below:

- May to early October → Rainy Season
- October to November & December to February → Cool Season
- March to April → Warm Season

The Climate of West Jaintia Hills District is uniquely pleasant and caressing. It is neithertoo warm in summer nor too cold in winter. The rainfall profile is very high during the south west monsoon, which usually starts from the middle of May and declines towards the last part of September. The intensity of rainfall in the district during the last few years has registered a rising trend, due to the untimely vagary of monsoon coupled by the existence of fogs, mists and nimbus clouds which loom large during the rainy season. The Average Relative Humidity is the highest during the month of July while December records the lowest Relative Humidity.

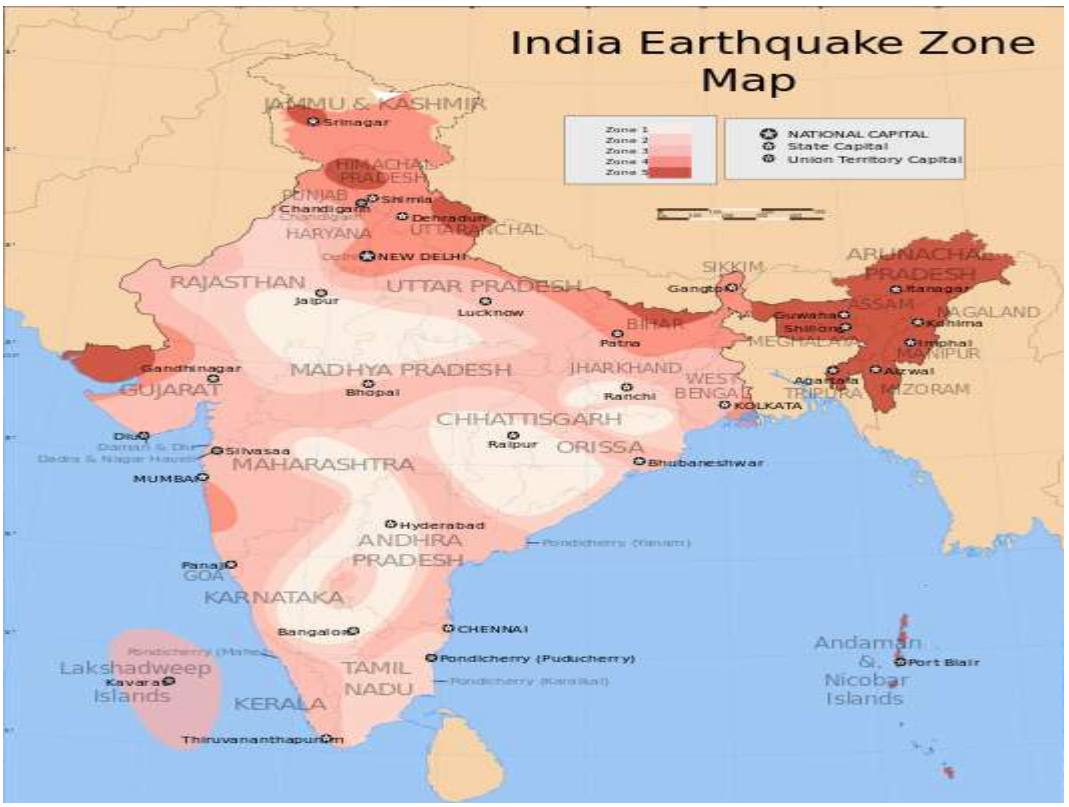
Natural Hazards:

As the State lies in the seismically active zone, special emphasis should be given to reduce the impacts of earthquake. Moreover, it is also affected by hazards such as floods, flash floods, epidemics, fire, hailstorm, lightening, road accidents, etc.

The State of Meghalaya has witnessed seismic events of ‘8.7 magnitude in 1897’. This region has been identified as a potential site of a future catastrophic earthquake. With the growth of population and infrastructure seismic vulnerability has increased and previous earthquakes have provided a glimpse of the devastating potential of seismic tremors.

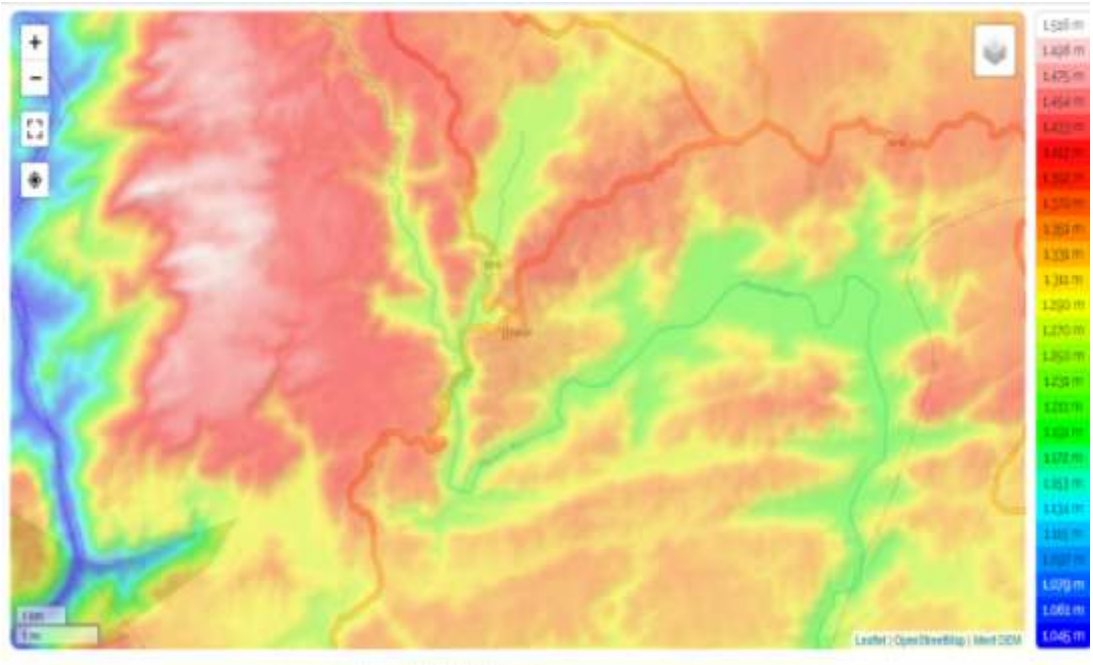
The project road falls under seismic zone 5 i.e most seismically active region.

Seismic Map of India



4.1 Topography:

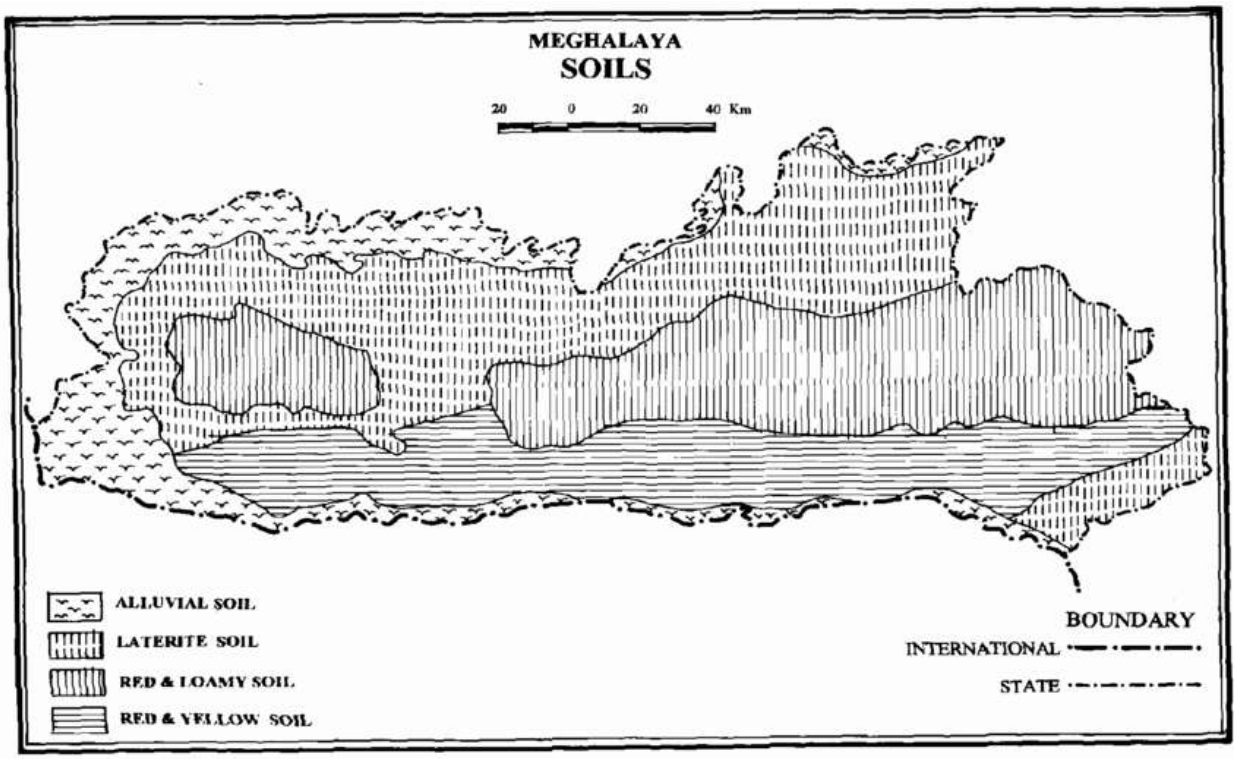
Jowai Town: The topography Jowai Town comprises of landscapes that have a blend of mountain and plateau regions.



4.2 Soil & Geology:

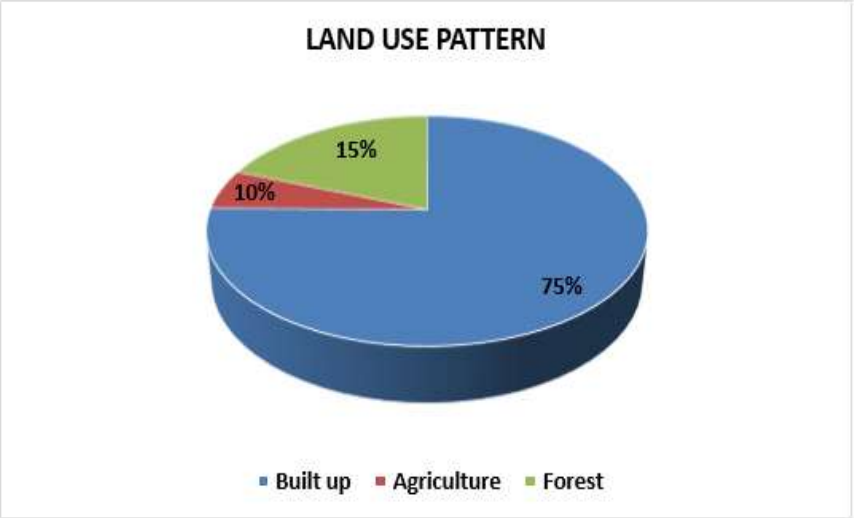
The climate, vegetation, relief and parent material constituting the ecosystem influence significantly the pedogenesis resulting in the development of different kinds of soils. The project location is covered by the warm per-humid agro-ecoregion.

The area forms a part of Meghalaya plateau comprising Archaean Basement Complex and younger sediments. The Archaean Basement CompOlex and the overlying Proterozoic metasediments of Shillong Group form NE-SW trending strike redges with prominent Valleys. Quartzite and conglomerate form high hills whereas phyllites, slate and quaternary valley fills form the low-lying valleys. The Shillong Group of rocks were deposited in a shallow marine environment. Gneisses and schistose rocks of the Archaean age are the oldest rock of the area forming the basement complex of Assam Meghalaya Gneissic Complex. The other rocks present in the area are quartz-biotite-sillimanite schist and migmatites. The regional strike of the foliation is more or less NE-SW with southerly dips. Veins of quartz and pegmatites mostly follow the foliation trend. The Shillong Group of rock includes conglomerate, quartzite, phyllites and quartz mica schist. The above group of rocks is intruded by grey/pink Alluvium comprising dark brown to brown oxidized sand, silt clay of Chapar and sorbhog formation is found towards northern part of the district. A NESW trending shear zone traverses through the eastern part of the district.



4.3 Land Environment:

Land and soil constitute the basic components of the physical environment. The land use pattern alongside the project road is predominantly built up.



4.4 Water Environment:

The Project area is rich in water sources. There are several major river/streams are there in the vicinity of the project corridor. All of these rivers are perennial. Ground water resources are used for drinking purpose by open wells, Bore wells, tube wells or installing hand pumps.

The major drainage system in West Jaintia Hills District includes the Myntdu, Myntang and Mynriang river systems which are perennial in nature and are the main sources of freshwater for the livelihood of the residents of the district in terms of domestic consumption and agriculture as well as for power generation.

Water Quality: Water is found to be an important source for catering to the local needs of water consumption for various purposes, mainly domestic. Wells and hand pumps are not frequent within the proposed all possible tools such as monitoring with spontaneous remedial suggestions, if required. Bore wells and hand right of way. However, hand pumps are used as a source of drinking water in the settlements along the project road. Few river and stream are present in the project periphery. Therefore, any deterioration in the water quality owing to the developmental activities will pose threat to the concerned population and attention needs to be paid towards maintaining the quality of water using pumps are important in local context and therefore their water quality needs to be monitored in order to assess the impact due to the project.

A separate Environment Management and Monitoring Plan for the safeguard of water environment have been prepared to mitigate the different impacts caused due to construction activities, which is provided in the subsequent chapters.

4.5 Air Environment:

Air pollution is caused due to both natural and manmade processes. The main source of air pollution is human induced/manmade, which includes industrialization and its by products, burning of timber, heat and light, rapid urbanization, vehicular pollution, plastics, burning of polymers and processing of various materials emitting obnoxious gasses, generation of smoke, dust and fine respirable particles due to construction activity and rapid burning etc. Vehicular emission is major source of air pollution now-a-day. Presently some patches of study area are in the locality of heavy traffic movement particularly at congested places i.e at major market areas, which may impact the ambient air quality of the area. During construction stage of the project, temporary air pollution arises due to movement of construction vehicles, operation of plants & machineries, dust emission due to excavation and demolition etc.

Ambient air quality is the most significant parameter that is required to quantify the impact on the natural and biophysical environment. The air quality parameters considered for the construction phase includes Particulate Matter 10 (PM10), Particulate Matter 2.5 (PM2.5), Nitrogen Oxides (NOx) Sulphur Di-oxide (SO2), and Carbon monoxide (CO).

Table 4.1: Ambient Air Quality Standard

Parameter	Technique	Technical Protocol	NAAQM Standards (24 hrs basis)
Particulate Matter (Size less than 10µm) or PM10, µg/m3	Respirable Dust Sampler (Gravimetric method)	IS-5182 (Part-IV)	100
Particulate Matter (Size less than 2.5µm) or PM2.5 , µg/m3	PM 2.5 APM 550 Fine Particle Sampler (Gravimetric method)		60
Sulphur Dioxide (SO2), µg/m3	Improved West and Gaeke Method	IS-5182 (Part-II)	80
Nitrogen Dioxide (NO2), µg/m3	Jacob and Hochheiser	IS-5182 (Part-IV)	80
Carbon Monoxide (CO), mg/m3	Non – dispersive Infrared (NDIR) Spectroscopy	IS-5182 (Part-IV)	4

A separate Environment Management and Monitoring Plan for the safeguard of air environment have been prepared to mitigate the different impacts caused due to construction activities, which is provided in the subsequent chapters.

4.6 Noise Environment:

Noise can be defined as any sound that is undesirable because it interferes with speech and hearing, and is intense enough to damage hearing or is otherwise annoying. Noise impacts can be of concern during construction and operational phases of the project.

Noise quality is an issue particularly at congested locations due to heavy traffic jams, horns and slow-moving traffic. The educational institutions, health care facilities, Court etc along the project corridor comprise sensitive receptors with respect to noise pollution.

The Ambient Noise Quality Standards with respect to noise have been stipulated by Govt. of India vide Gazette Notification dt.14.02.2000.

Table 4.2: Ambient Noise Standards

Area Code	Category of Area	Limits in dB (A), Leq	
		Day time	Night time
A	Industrial Area	75	70
B	Commercial Area	65	55
C	Residential Area	55	45
D	Silence Zone*	50	40

* Silence zone is defined as an area up to 100 meters around such premises as hospitals, educational institutions and courts. The silence zones are to be declared by the competent authority;

A separate Environment Management and Monitoring Plan for the safeguard of noise environment have been prepared to mitigate the different impacts caused due to construction activities, which is provided in the subsequent chapters.

4.7 Biological Environment:

Ecological resources are among the most important resources impacted by the road/infrastructure projects. The detailed baseline study of the ecological resources is essential to estimate the magnitude of potential impacts and to avoid or mitigate any loss caused by the proposed project. In this section baseline details of the flora and fauna are presented.

Meghalaya is among the few States in the country which can be proud of its abundance of natural forest wealth spanning across large part of its geographical area, much higher than national average. Its location, physiographical features, altitudinal variation, abundant rainfall, salubrious climate and fertile soils favours high species diversity and supports different types of forests. The Vegetation types ranging from tropical rain forest in foothill to Alpine meadows and cold desert. This rich flora had been the centre of attraction for many botanists starting from Buchanan Hamilton (1820-24) and rightly considered as ‘Botanist Paradises’. This region was described by Hooker as “Cradle of Angiosperms”.

True to its name, ‘Meghalaya’ is an abode of clouds and thus increased moisture conditions prevails. The hills rise abruptly in south, while it is gradual in north. The altitudinal variation range from 50 meters to 1950 meters with the Shillong plateau at the crest. The hills are dissected and drained by numerous rivers and rivulets draining to north and south. The climate is monsoonal with distinct warm-wet and cold-dry periods. The towns of Sohra (Cherrapunjee) and Mawsynram, which are located on the Southern part of the State, receive very heavy rainfall and amongst the wettest spots in the world.

West Jaintia Hills District is rich in forest. The heavy and long monsoon supports the luxuriant forest of pines over the district. The principal forest produces are timber, bamboo, medicinal herbs and plants, Orchids of different species like Blue Yanda (Yandacoeru lea), ladies slipper (Paphiopedilum insigne), Golden shower (Cymbidium elegans), Dendrobium chrysanthum, Anoectochilussikkimensis, Liparis pulchella are found in the forests of the district. Pitcher plants or Nepenthes KhasianaHk, the insect eating plants of Botanical wonder are found in plenty in and around Jarain area.

Fauna & Flora: This area is neither coming under any type of Protected Forest nor Reserve Forest. There is no Protected Area (National Park, Wildlife Sanctuary and Biosphere Reserve) located within 10 km radius of the project site. As per site inspection, the common species of flora and fauna available are provided below.

Table 4.3 : List of Fauna

MAMMALS	SCIENTIFIC NAME
Common Tree Shrew	Tupaia belangeri
Bengal Slow Loris	Nyctcebus bengalensis
Assamese Macaque	Macaca assamensis
Capped Langur	Trachypithecuspileatus
Lesser Bandicoot Rat	Bandicota bengalensis
Indian Flying Fox	Pteropus giganteus
AVI-FAUNA	
Grey Sibia	Heterophasiagracilis
Dark-rumped Swift	Apus acuticauda
Tawny-breasted Wren Babbler	Spelaeornislongicaudatus
White-naped Yuhina	Yuhina bakeri
Black-browed Leaf- Warbler	Phylloscopuscantator

Table 4.4 :List of Flora

Common / Local Name	Scientific Name
Shorearobusta	Sal, Sakhu
Mesua ferrea	Dieng ngai, Nahar
Myrica esculenta	Box myrtle, Dieng Sohphi
Prunus cerasoides	Wild Himalayan Cherry
Betula alnoides	Dieng ling
Tectona grandis	Teak, Segun
Pinus kesiya	Khasi pine
Lagerstroemia spp	Ajhow, Jarul, Sida
Michelia spp	Champ, Sopa, Titachap
Bombax ceiba	Semul
Terminalia Myriocarpa	Hollock
Gmelina arborea	Gamari (State Tree)
Xyliaxylocarpa	NA
Albizia Spp	Hiraru, Moroi, Mog, Kako, Sundi, Saw, Harish
Toona ciliata	Poma
Terminalia spp.	Bahera, Bhomda
Schimawallichii	Makrisal, Nagaplu
Castanopsis indica	Hingori

Common / Local Name	Scientific Name
Syzigiumjambosa	jamoon
Artocarpus	Sam, Champ, Kathal
Quercus spp.	Oak
Chukrasiatabularis	Chuma, Dieng Dkharbti

4.8 Socio-Economic and Health Environment

The project road falls under Ri Bhoi districts of Meghalaya state.

4.9 Social Environment

4.9.1 The State Profile of Meghalaya

The State of Meghalaya was carved out of Assam as an autonomous State in April 1970 and was declared a full-fledged State in January 1972. Meghalaya, situated in the north eastern region of India is a narrow stretch of land, running between Bangladesh on the South and West and Assam on the North and East, Meghalaya lies between 24° 58' N to 26° 07'N latitudes and 89° 48'E to 92° 51' E longitudes. It covers an area of 22,429 sq. km. The State has most of its land covered by hills interspersed with gorges and small valleys. Endowed with dense forests and rivers cascading down undulating terrain, this region is one of the most scenic of the North Eastern States.

Thus, out of the total forest area of 15,657 sq. km in the State only 1,027.20 sq. km is under the control of State Forest Department, which constitutes only 4.58 % of the total geographical area of the State and 6.56 % of the total forest area of the State. Rest of the area is either private or clan /community owned and is under the indirect control and management of the Autonomous District Councils.

The population of Meghalaya is predominantly tribal, the main tribes are the Khasis, the Jaintias and the Garos besides other plain tribes such as Koch, Rabhas and Bodos etc The Khasis and the Jaintias predominantly inhabiting the districts towards eastern part of Meghalaya, belong to the Proto AustroloidMonkhmer race. The ESIA Study Proposal of Roads lies under West Khasi, RiBhoi, South West Khasi, Jaintia, East Garo Hills respectively.

4.9.2 District Profile:

West Jaintia Hills is an administrative district in the state of Meghalaya in India. The united district (Jaintia Hills District) was created on 22 February 1972 and occupied an area of 3819 km2 It had a population of 270,352 (as of 2011). The district is part of the Meghalaya subtropical forests ecoregion. With the bifurcation of the erstwhile Jaintia Hills District into East and West Jaintia Hills Districts, West Jaintia Hills District came into existence on 31 July 2012 with its headquarters at Jowai. Jowai is the host of all the heads of important governmental offices and establishments, educational institutions, hospitals, banking institutions, etc

Jowai is a Municipality city in district of West Jaintia Hills of Meghalaya. It is situated 64 km away from the state capital Shillong. It serves as district headquarters and is an important business and education hub for the entire district. As per 2011 India census, Jowai had a population of 28,430. Climate of Jowai is pleasant, neither too hot in summers nor too cold in winters. The rain profile is very high during the south west monsoon. During the last few years,

the intensity of rainfall in the district has registered a rising trend. The district's most popular modes of transport are Maruti, Alto and private Taxi. In absence of any Rail or Air links, Roads are the only lifeline for Jowai.

4.9.3 Demographic Profile

As per the Population Census 2011, there are total 4,942 families residing in the Jowai city. The total population of Jowai is 28,430 out of which 13,675 are males and 14,755 are females thus the Average Sex Ratio of Jowai is 1,079.

Table 4.5: Demographic Profile of West Jaintia Hills District

Description	Total	Male	Female
Total Population	28430	13675	14755
Children	3,857	1,958	1,899
Literacy	91.10%	78.70%	78.80%
Scheduled Caste	102	60	42
Scheduled Tribe	25,941	12,249	13,692
Illiterate	6,043	2,915	3,128

Source: Census 2011

Table 4.6 : Distribution of Rural and Urban Population

Description	Urban	Rural
Population (%)	92.80 %	7.20 %
Total Population	366,694	28,430
Male Population	182,610	13,675
Female Population	184,084	14,755
Sex Ratio	1008	1079

Source: Census 2011

4.9.4 Schedule Castes and Schedule Tribes

The social stratification of the project area shows of Schedule Tribe population with 91.2% households. The second stratum of the social grouping in the area is of Schedule caste population of 0.4%.

4.9.5 Literacy Rate

The total literacy rate of Jowai was 91.1% in 2011 which is greater than average literacy rate 74.43% of Meghalaya. Population-wise, out of total 22,387 literates, males were 10,760 while females were 11,627. Also, the male literacy rate was 91.83% and the female literacy rate was 90.44% in Jowai.in the PIA.

4.9.6 Employment Pattern

Economic backwardness is the leading problem of the state as majority of the population is below the poverty line. Although the state is rich in mineral resources, the industrial

linkagesarevirtually absent and government is the major source of employment in the organized sector. Activities like animal husbandry, fishery, poultry and horticulture have not been targeted as a major source of employment. Therefore, agriculture forms the only option for the people to seek gainful employment. This too is influenced by impediments such as shifting agriculture, poor productivity, land tenure system and traditional methods of cultivation. All these factors have resulted in poor land and labour productivity.

As unemployment and poverty are correlated, it becomes necessary to understand the occupationalpatternoflabourforceandstatusofemploymenttoanalysethedevelopmentinthe state.

4.9.7 Economic Development

Meghalaya has predominantly anagrarianeconomywith a significant commercial forestry industry. Meghalaya's gross state domestic product for 2012 was estimated at16,173 crore(US$2.5billion) in current prices.The state is geologically rich in minerals.The state has about 1,170km of national highways. It is also a major logistical centre for trade with Bangladesh.Meghalaya has an ideal location advantage for South East Asia Market. The neighbouring countries of India viz Bhutan, Bangladesh, Myanmar has been involved with the state for business and commerce. It has a huge potential to reach other South Asian countries as well. Meghalaya is also geographically rich in minerals and has the potential for industrial setups based on these mineral resources. Above all the Meghalaya Industrial Policy is framed for the ease of doing business and increase trade and commerce. The added advantage being the climate in Meghalaya is good for the development of electronics chips.
Different types of Industry that can be ideally formed in the state are Mineral based Industry, Horticulture and Agro-Based Industry, Electronics and Information Technology, Export Oriented Units, Tourism and besides these the recent development in the state has seen many upcoming service sectors on customer service, real estate's etc.The State Government also provides various types of Central and State Incentives for the established Industrial Setups which includes Transport Subsidy, Income Tax Exemption, Excise Exemption, Capital Investment Subsidy, Special Incentives for Food Processing,Subsidy on Comprehensive Insurance, Power Subsidy, Subsidy on Power Line (33 K.V. and above),Employment Subsidy, Refund of Central Sales Tax.

4.9.8 Road Network

Meghalaya has a road network of around 7,633km, out of which 3,691km is black-topped and the remaining 3942km is gravelled. The state has couple of national highways running through it viz NH 40, NH 44, NH 51 and NH 62.

4.9.9 Railway

Meghalaya has a railhead atMendipatharand regular train service connecting Mendipathar in Meghalaya andGuwahatiinAssam. Guwahati is the nearest major railway station connecting the north-east region with the rest of the country through a broad-gauge track network.

4.9.10 Aviation

The state has an airport atUmroi which is at a distance of 30 kilometres from Shillong. There is also a helicopter service connecting Shillong to Guwahati and Tura. Baljek Airport near Tura became operational in 2008. Other nearby airports are in Assam, Borjhar, Guwahati airport, about 124 kilometres (77 mi) from Shillong. Newly operational Rupsi Airport is also near to Tura.

4.9.11 Agriculture and Cropping Pattern

Jaintia hills district has a total cropped area of 36479 Hectares out of which only 412 hectares (1.12%) is sown more than once or under double cropping and the rest under single or mono cropping system. About 70 percent of the total cultivated area is under rain fed condition and is used mainly for cultivation of ICAR-ATARI-III, Umiam Page 8 Kharif crops like Rice, Maize, and Soybean etc. Land utilization for Rabi crops is very less. The district experienced steep decline in the cropped area due to coal mining activities. The major crops are rice (occupying an area of 49%), maize (13%), Spices (7%), Arecanut (7%) and vegetables (8%). Maize cultivation both kharif and rabi are taken up by the farmers of the district as maize not only provides source of income but also provides feed for animals. in the past, farmers grow paddy once a year but now the farmers have come forward to cultivate this type of Boro Paddy, as it increases the crop production. In the lower altitude areas, boro paddy cultivation is taken up. in mid altitude and high altitude, multiple cropping was taken up in areas where irrigation is assured with a view to increase the cropping system, also converting mono cropping into double cropping system like growing potato and vegetables in paddy field. This was done after harvesting of paddy and then followed by potato or vegetables in the same areas and it was observed that production is more from both paddy and vegetables.

4.9.12 Animal Husbandry

Animal husbandry and Agriculture are related with the overall socio – economic conditions of rural tribal people of Meghalaya. Besides there is one Cattle Farm at Khliehtyrshi, one Poultry farm at Jowai one Pig Farm at Thadlaskein, one Sheep and Goat Farm at Saitsama for rearing of improved breeds of livestock for producing pedigree stock for distribution to the interested breeders. There is one Fodder & Seed production Farm at Saitsama for raising of fodders and fodder seeds production for distribution and one Dairy Milk Plan at Jowai for Pasteurising of Milk procured from the Dairy Co-operative Societies / Farmers. The present livestock population in the district is 637275. Out of which 58 % are Poultry, 23% cattle, 14% Pigs and 4% Goats.

4.9.13 Fishery

The PIA has unique topographical condition. The district is backward in Fishery with 1453 number of culture ponds and a total fish production of 282.2 metric tonnes. There are 2 fish seed farm FRP and one Eco hatchery. With the introduction of the Aqua mission scheme, there has been development of existing water bodies and creation of additional water area for large scale fish production, including reclamation of marshy and swampy lands.

4.9.14 Hospitals

The PIA has 1 hospital, 2 dispensaries, 8 primary health centres, 3 community health centres, 27 sub centres, 1 leprosy control unit, 1 set centre, 1 ayurvedic dispensary and 3 homeopathic dispensaries. Para medical personnel registered within 1km during the year for the service of the people of the district.

5 CHAPTER-V: ANALYSIS OF POTENTIAL ENVIRONMENTAL& SOCIAL IMPACTS & MITIGATION- MEASURES

During Planning and Design phase the road alignment, construction details, materials of construction etc. ultimately decide the impacts during later phases are evaluated. Most of the impacts are occurred during construction and operation phase. While some of the construction phase impacts are temporary, others are permanent. Operation phase impacts are continuous in nature. The important criteria for identification of impact are the identification of the impact zone. For present screening studies, a direct Corridor of Impact (COI) within 500 m road alignment has been considered.

Environmental parameters are broadly classified into three groups.

a) **Physical Environment includes:** Water Resources, Water Quality, Air Quality, Noise and Land environment etc.
b) **Biological Environment includes:** Terrestrial and aquatic biodiversity and Roadside Plantation etc.
c) **Social Environment includes**: Demography, Employment, Agriculture, Housing, Culture etc.

5.1 Environmental & Social Impacts and Mitigation Measures

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 detail of potential impacts & mitigation measures are mentioned in the below table.

Table 5.1: Impacts and Mitigation Measures

Sl. No.	Parameters	Potential Impact	Mitigation Measures Suggested
1	Topography and Soil	• Cut and fill operations during road construction	• The alignment passes through plain terrain and no substantial cut and fill operations are planned. Minimum cut will be ensured and the cut material will be reused as per the suitability.
		• Borrow earth	• Borrow earth will be procured from approved area • IRC guidelines will be followed during excavation • Top soil will be preserved & stockpiled properly. • Borrow area Redevelopment plan will be submitted prior to operation of the same. • Necessary clearance needs to be obtained prior to operation of the borrow area.
		• Quarries	• Operational and government licensed quarry have been identified, which will be used for procuring material. • Pollution Control Measures should be taken care. • Necessary clearance needs to be obtained prior to operation of the borrow area.
2	Air Environment	• Generation of dust	• Sprinkling of water a. Earth handling site b. Borrow area c. Road construction site

Sl. No.	Parameters	Potential Impact	Mitigation Measures Suggested
			d. Access road route • Air pollution control at crusher and Plants a. PPE for Workers b. Stone crushing units and Plants should be with environment compliance. c. Necessary clearance needs to be obtained prior to operation of the borrow area. • Regulations of construction timings near sensitive receptors and settlements
		• Gaseous Pollution	• Vehicles and machineries will be regularly maintained to conform to the emission standards. • Asphalt mixing sites and Crusher sutes should be 1 km away from residential area and outside forest area. • Asphalt plant will be equipped with pollution control equipment • Use of PPE by workers engaged in construction and application of asphalt mix on road surface. • Responsibility of contractors and supervising officers that the workers use the PPE.
3	Noise Environment	• Noise level may likely to increase during construction phase	• Properly maintained equipment to be used • Noise levels of machineries used shall confirm to relevant standard prescribed in Environment (Protection) Rules, 1986 • Ear plugs and muffs will be used by the workers as per requirement during construction activities • Regulation of timing of construction work generating noise pollution near the sensitive areas
4	Water Environment	• Drainage pattern	• Provision of proper drainage through culverts along the project road (if required) • All the water bodies will be crossed by the bridges and structures without affecting their original course and flow • Stabilizing and turfing of slopes along the water bodies (If required)
		• Siltation of water bodies	• Silt fencing around water bodies during construction to avoid silt laden runoff entering water body (If Required) • No solid waste will be dumped in or near the water bodies or rivers
		• Flooding due to siltation of drainage channel	• Excavated earth and other construction materials should be stored away from water bodies
		• Water for construction	• Water surface would be selected so that local availability is not affected
		• Contamination from waste	• Provision of septic tanks to prevent any untreated sewage discharge from construction worker camps • Oil interceptions at construction machine maintenance yards
		• Contamination from fuel and waste	• Vehicle maintenance will be carried out in a confined area, away from water sources and it will be ensured that used oil or lubricants are not disposed to water courses
		• Sanitation and	• Construction camp will be organized in a planned

Sl. No.	Parameters	Potential Impact	Mitigation Measures Suggested
		water use in construction camps	manner • Proper sanitation facilities including toilets should be provided • Camps will have separate water supply facilities so that local water sources are not affected
5	Land Environment	• Loss of topsoil	• Topsoil on stripping shall be removed and stockpiled on sides to be used on the side slopes, for top cover of borrow areas and for plantation pits
		• Loss of topsoil from borrowing	• Arable lands will be avoided for earth borrowing. If needed, topsoil will be separated and refilled after excavation
		• Borrowing of fill material	• Excavation from pre-selected locations. After excavation the borrow pits will be dressed to match with the surrounding
6	Biodiversity	• Loss of Tree and hunting of animals	• Minimum tree cutting should be ensured and with due permission by the forest department. • No animals will be hunted and harmed by the construction workers. • C & D waste will not be dumped in any water body.
7	R & R	• Land Acquisition • Loss of Structures and CPRs	• Land acquisition not applicable. .

5.2 Social Impact Assessment

5.2.1 Projects Impacts

The urban infrastructures project is associated with some adverse impacts as well as some benefits. The major impacts of the project include temporary loss of livelihood during the actual construction period due to inaccessibility to the commercial enterprise all along the project corridor and in Parking Areas. Socio Economic survey was done September, 2021. Due to the pandemic situation the Census Survey Started from 10th November to 20th December, 2021 is nearly completed and will be updated in the final DPR. The SES was done in September 2021 and also consultation was done from September to December 2021 which is completed for the present design phase.

5.2.2 Positive Impact

This sub-project aims to reduce traffic congestion within the Jowai road. The storm water drain improves the existing system of rain water flow as most of the drain chokes due to silting. The new design will make easy cleaning/desilting of the storm water drain and thus prevent the overflow of water on the black top. The footpath over the drain and utility corridor will reduce accident.

- People residing at the Jowai road can easily travel within the area. It will give a major fillip to the quest for all weather good roads for the PIA.
- Lower accident and provide quick accessibility to services like hospital, market, office etc.

5.2.3 Impact on Land

As discussed earlier also there is no scope of land acquisition and the RoW is free from all encroachments and encumbrances in the project area. The proposed construction of parking areas is within the available Government land.

5.2.4 Impact on Structures

During the census survey the structures were also enumerated along the proposed developments. Based on the updated DPR there will be no impact on private structures.

Table 5.2: Loss of Structure in the Sub-Project

SL. No.	Type of Ownership	No. of Structures
1	Total Affected Families	Nil
2	Title Holders	
3	Non-Titleholders – Encroachers	
4	Non-Titleholders – Squatters	
5	BPL Families losing Commercial Properties	
6	Total vulnerable families (including BPL)	
7	Total Tribal Families	
8	Vendors affected	
9	Petty shop keepers & Kiosk affected	

Source: Census Survey, January 2022

5.2.5 Impact on Community Structures

Based on the updated DPR no CPRs will be affected with the proposed improvement of the town roads.

Table 5.3: Loss of CPRs in the Sub-Project

Sl. No.	Summary of CPRs	Numbers
1	Religious structure (specify)	Nil
2	Well	Nil
3	Waiting Shed/Rain Shelter	Nil
4	Schools/Educational/ Cultural Structures	Nil
5	Government/ Community Structures	Nil

Source: Census Survey, September 2021

5.3 Displaced Families

Displaced family: means a family, who on account of acquisition or purchase of land needs to be relocated and resettled from the affected area to the resettlement area or elsewhere;

- **Titleholder:** A person who has legal rights of the land acquired/purchased by the project;
- **Encroacher:** A person/family, who transgresses into the public land (i.e., extended their building, agricultural lands, business premises or work places into public land), adjacent to his/her own land or other immovable assets and derives his/her additional source of shelter, livelihood, etc.;
- **Squatter:** A person/family who has settled on public/government land, land belonging to institutions, trust, etc. and or someone else's land without permission for residential, business and or other purposes or has been occupying public building without authority prior to the cut-off date and is depending for his or her shelter or livelihood and has no other source of shelter or livelihood;

- **Tenant:** A person who holds/occupies land/structure of another person and (but for a special contract) would be liable to pay rent for that land/structure. This arrangement includes the predecessor and successor-in-interest of the tenant but does not include mortgage of the rights of a landowner or a person to whom holding has been transferred; or an estate/holding has been let in farm for the recovery of an arrear of land revenue; or of a sum recoverable as such an arrear or a person who takes from Government a lease of unoccupied land for subletting it;
- **Family:** Includes a person, his or her spouse, minor children, minor brothers and minor sisters' dependent on him. Widows, divorcees, and women deserted by families shall be considered separate families;
- **Persons losing their livelihood:** Persons losing their livelihood are individual members of the PAFs/households, who are at least 18 years of age and are impacted by loss of primary occupation or source of income;
- **Business Owner:**Persons owning shops or running any commercial activities and/or within any commercial interest and above the age of 18 is considered as business owner.
- **Employees to Commercial Structures:**Persons being employed formal or informal, temporary or permanent to any commercial enterprise or entities in lieu of some remuneration/ salaries/ payments are considered as employees to commercial structures.
- **Petty shop/Kiosk:** It could be cubicle/booth/stall/cabin made of wood or iron or any other building material which could be shifted to another location as a single unit without much damage and is used for carrying out petty business, commercial activities and has been in operation/existence prior to cut off date;

5.3.1 Impacts on Displaced Families

During the social survey both title holders and non-titleholders who would be impacted (positively) were taken as sample households. Based on the social survey data of 21 sample Familiesthe socio-economic condition of the area is depicted.

5.3.2 Demography of Families

Socioeconomic survey was carried out for 21 sample families with 101 number of total populations. The sample was selected at the primary beneficiaries such that there is proportional representation of the socio-economic parameters of the PIA. The sample survey data reveals that average family size of the sample family is (4.8).

5.3.3 Family Pattern

Socio-economic survey reveals that only 15% of the Surveyed Families are Joint in nature.

Table 5.4 Family Pattern

Sl. No	Family pattern	Numbers	Percentage
1	Joint	26	15%
2	Nuclear	148	85%
Total		174	100%

Source: Census & SES Survey, September 2021

5.3.4 Religious Stratification

Christianity is the predominant religion in the primary PIA followed by Other Religions. The detail presence of religion in the PIA is depicted in the Table 5.6.

Table 5.5 Religious Stratification

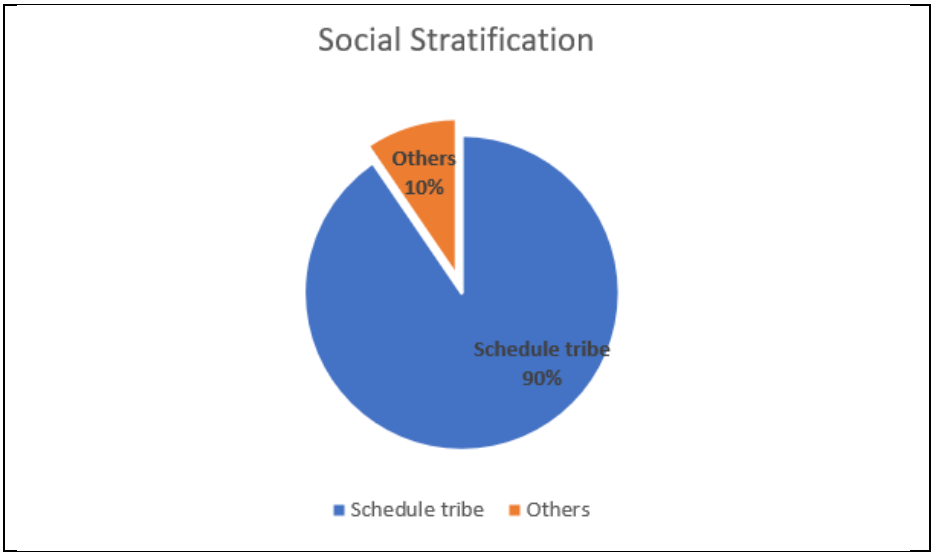
Sl. No.	Category	Percentage
1	Christianity	83%
2	Hindu	4%
3	Muslims	1%
4	Others	12%
Total		**100%**

Source: Census & SES Survey, September 2021

5.3.5 Social Stratification

The social stratification of the project area shows dominance of ST population with 90% families followed by Schedule Caste families at 0%. The third and fourth stratum of the social grouping in the PIA is of Others comprising of 10%. The detail of social grouping in the project area is presented in the Figure 5.1

Figure 5.1Categories of Surveyed Families along the Project Road

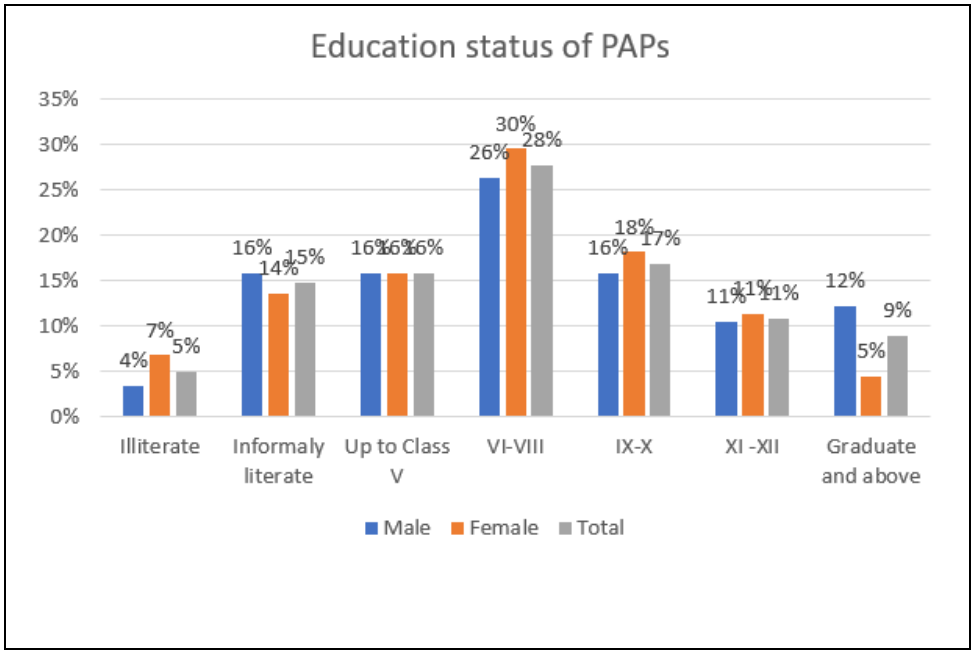


Source: Census & SES Survey, September 2021

7.1.1 Educational Status of PAPs

The educational status of the PAPs, above 6 years of age, reveals that overall scenario of literacy level is not very encouraging in the project area. Out of total 101 sample population the number of child population (0-6 yrs.) is 9 which are kept aside for this category. Only 5% of the population is still illiterate and about 9% PAPs are graduates. The educational status is presented in the Figure 5.2

Figure 5.2Educational Status of PAPs



Source: Census & SES Survey, September 2021

5.3.6 Occupation of PAPs

The occupational status of PAPs reveals that 52% Population are depending on business and this includes the business they are carrying out along the road, mainly shops and kiosks. About 5% Population are having agriculture as their source of income and no one engaged in government jobs & private Jobs. The details of occupations by the PAPs are presented in the(Table 5.7).

Table5.6 : Occupational Status of PAPs (18-60 Years)

Sl. No	Type of Occupation	Percentage
1	Agriculture & Allied Activities	5%
2	Government & Private Services	0%
3	Trade & Business	52%
4	Self Employed	0%
5	Casual Labour	10%
6	Non-Remuneratively Engaged	33%
Total		100%

Source: Census & SES Survey, September 2021

The total number of persons is 101 and the number of persons within the active age group of 15 to 64 years is 58. Thus, the dependency ratio is about 48[1].

5.3.7 Income and Expenditure Profile of DFs

All the families surveyed have an average annual income more than Rs. 30000/. About 18% Surveyed Families are having average annual income in the range of Rs. 30000-50000, while 58% of the families are earning between Rs. 50000-100000. It has been observed that about 24% Surveyed Families have annual income more than Rs. 1,00,000. The average income level of DF in the project area is summarized in the (Table 5.8).

[1]As per theWorld Bank the dependency ratio based solely on old age. It only reports on the proportion of senior dependents per 100 in the working-age population.Its formula is the number of seniors aged 65 or older divided by the working-age population aged 15–64. It doesn't count children.

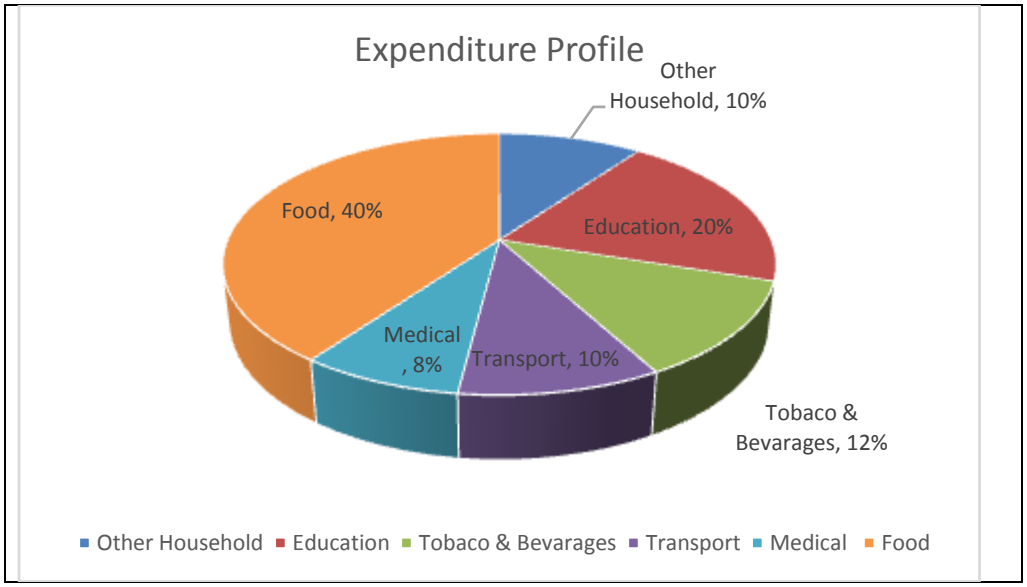
Table 5.7Annual Income Profile

Sl. No.	Annual Income Categories in (Rs)	% Age
1.	More than 30000 but less than or equal to 50000	18%
2.	More than 50000 but less than or equal to 100000	58%
3.	More than 100000	24%
Total		**100.00%**

Source: Census & SES Survey, September 2021

The expenditure pattern of the families surveyed revealed that about 40% of the average expenditure incurred by the Surveyed Families is on the food items. The detail of the same is presented in graphical format in Figure 5.7. The average annual expenditure is about Rs. 46,254 for the 21 sample families.

Figure 5.3Annual Expenditure Profile



Source:Census&SESSurvey,September 2021

5.3.8 Holding of Agricultural Land (Immovable Assets)

Only 5% of the population owes more than 0.5 acre of land. The detail of the land holding is depicted in the Table 5.9.

Table 5.8Agricultural/Homestead Land Holding

Sl. No	Land owned (area in Acres)	Numbers	Percentage
1	Less than 0.25	18	86%
2	0.25-0.5	2	10%
3	More than 0.5	1	5%
4	No land	0	0%
Total		21	100%

Source: Census & SES Survey, September 2021

5.3.9 Possession of Vehicle (Movable Asset)

Majority of the population (0%) have only four wheelers followed by two wheelers (11%) as mode of Family transport. The detail of the movable assets holding is depicted in the Table 5.10.

Table 5.9Movable Assets Holdings

Sl. No	Family assets	Numbers	Percentage
1	2-wheeler	11	52%
2	3-wheeler	0	0%
3	4-wheeler	0	0%
4	2-wheeler & 4-wheeler	9	43%
5	More than one 2-wheeler & 4-wheeler	1	5%
6	No Assets	0	0%
Total		21	100%

Source: Census & SES Survey, September 2021

5.3.10 Vulnerability

VulnerableFamiliesaredefined as, whoareeither:(i)belowpovertyline(BPL);or(ii)womenheadedhousehold(WHH);or(iii) differently able households(DAH);or(iv)elderly(60yearsandabove) living alone; or (v) scheduled tribes (ST); or (vi) scheduled caste (SC). It shall be noted here that though there are multiple categories of vulnerability groups exist in the project road, we have taken single impact of single vulnerable category for the authentication. For example, the number of BPL/DA/Aged Person/WHH mentioned in the below table does not include those who fall under SC and ST category to avoid the repetition of data and vice-versa. Vulnerability is defined on Census Survey data.

The census survey finding reveals that there is 90% surveyed population along the roadside who belong to the ST community and 0% belong to SC category &5% families are Women headed household. The total vulnerable families in the PIA are about 100%.

Table 5.10Vulnerability Status of the Affected Families

Sl. No.	Category	%Age to total population
1	Schedule Tribe	90%
2	Schedule Caste	0%
3	Below Poverty Line (Excluding ST, SC)	5%
4	Women Headed Households	5%
5	Senior Citizen living alone	0%
Total Vulnerable DFs		100%

Source: Census & SES Survey, September 2021

5.3.11 Impact on Gender

In Indian context, irrespective caste, creed, religion and social status, the overall status of women in lower than male and therefore a male child is preferred over a female child. According to 2001 Census in Meghalaya, the sex ratio was 972 females per 1000 male in 2001 but it has increased in 2011 with 989 females per 1000 male which is an indication of social development.

The gender composition of surveyed persons shows that the male accounts for 51% and female accounts for 49%. The gender disparity is not so much visible in among surveyed persons i.e. 986 against state level statistic having 989 but as per census data of India, 2011. The sex ratio of West Jaintia Hills district is 940 females per 1000 males in 2011. The illiterate among the female is slightly higher than of the male counterparts. There is 1 of the Surveyed Familyis Women Headed Households. From the SES survey the total Population is 101, of which 54 are males &47 are females.

5.3.12 Migration

The Decadal growth rate of the West Jaintia Hills district and town clearly indicates influx of migrates from the nearby districts and villages. The SES reveals that about 15% of the population has immigrated in the urban in the last 25 years.

5.3.13 Impact on Tribal People

a. Impact on Land & Structure of ST

No structures impacted by the proposed project belong to the STs.

Table 5.11Impact of ST DFs

Sl. No.	Type of Ownership	No of Affected Household Families	No. of Structures
1	Title Holder	-	-
2	Non-title holder	-	-
3	Tenants	-	-
4	Losing land only	-	-

Source: Census & SES Survey, September 2021

b. Impact on Socio Economic Profile of ST

The ST population is the majority present in the project affected area does not follow customs that are attach to their land and also not attached to their natural habitat for their living. The proposed sub-project can be viewed as boosting economic growth and poverty reduction, which will bring substantial social and economic development in the region. The ST Surveyed Families have between Rs.50,000 to Rs. 1,00,000 annually.The ST in the project affected area is living in the towns and became the part of the mainstream population. Thus, there will be no negative (culturally or socially) impact on the ST population. Again, the STs are yet to foresee any serious adverse impact for the area in general. Being at town within the developed localities, the people in general are accustomed with the probable risk of development, such as spread of HIV/AIDS and STD, drug abuse that can trap the youth and trafficking of women and children. According to the people these hazards are already faced and conquered by them.

c. Impact on Community

This sub-project has ensured that the designed and implementation will be in such a way that it fosters full respect for ST identity, dignity, human rights, livelihood systems, and cultural uniqueness as they define them. There is no impact on the community structure or community land of cultural or religious sentiment of the ST Population in the Primary PIA. The proposed project will ensure that STs receive culturally appropriate social and economic benefits, do not suffer adverse impacts as a result of projects, and can participate actively in projects that affect them.

There is no cultural heritage site of the ST which comes in the way of the road alignment. The ST population among the Surveyed Families inthe PIA are living in the towns and intheduecourseoftimebecamethepartofthemainstreampopulation.PresentlytheimpactedSTpopulationdoesnotfollowanycustomsthatareattachedtotheirlandornaturalhabitatwhichwillbeimpacted. Thus,therewillbenoculturalorsocialimpactontheSTpopulation.

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d. ImpactonGender

The tribes of Meghalaya whosesocieties are organized on matrifocal principleshave obtained much greater gender equality than the societies (e.g. Hindu and Muslim) that are organized on the patriarchal principles.

However, it was identified that social and economic benefits for affected which are culturally appropriate and gender and inter-generationally inclusive and develop measures to avoid, minimize, and/or mitigate adverse impacts on STs mainly the Gender. Suggestion of noise barrier, reduction of dust, providing employment of the female members as unskilled labourers during construction were the results of the focus group discussions.

Continuous meaningful focus group discussions with the ST women and affected STs communities and concerned STs organizations were carried out and will be carried on to solicit their participation (i)in designing, implementing, and monitoring measures to avoid adverse impacts or, when avoid acne is not possible, to minimize, mitigate, or compensate for such effects; and (ii) in tailoring project benefits for affected ST communities in a culturally appropriate manner. To enhance STs' active participation, projects affecting them will provide appropriate and gender inclusive capacity development. Establish a culturally appropriate and gender inclusive grievance mechanism to receive and facilitate resolution of the ST concerns.

5.3.14 Impact on Access to Services Amenities

- **Transport facility**

Transport facility is considered as the most basic of all civic amenities as this is the life line to access any kind of social services. Most of the clusters in the PIA have adequate road transport facility but it fails to cater its benefit due to bad condition of the road during winter and rainy season. JowaiTown is well connected with the rest of the state. Nearby railway station of Jowai town is Guwahati Railway Station.

- **Solid Waste Dumping Facilities**

The PIA is congested with structures and roads and as it is situated on the hill slope, solid waste dumping is a very sensitive issue in the area. As per the SES it is revealed that more than 95% of the people dispose solid waste by the method of 'door to door' collection by local Authority in the urban area.

- **Source of Drinking Water**

The main source of drinking water in the PIA is river, streams and ponds (nearly 10%).

Table 5.12Source of Drinking Water

Sl. No	Types of drinking Water Source	Numbers	Percentage
1	Tap Water by ULB	18	86%
2	Groundwater/surface water	3	14%
Total		21	100%

Source: Census & SES Survey, September 2021

- **Distance of Medical Facilities**

Medical facilities like government hospital and urban health centres (UHC) are not easily available within 1km for 100% of the population.

Table 5.13Distance of Medical Facilities

Sl. No	Distance of Medical Facilities	Numbers	Percentage
1	Within 1km	21	100%
2	Within 2km	0	0%
3	Within 5km	0	0%

4	More than 5km	0	0%
Total		21	100%

Source: Census & SES Survey, September 2021

- **Other Services**

The proposed project will enhance the standard of living and/or quality of life of the residents of West Jaintia Hills. During the construction there might some temporary restrictions in access which have to be taken care in the Resettlement Plan.
There is no permanent impact regarding the limited access to services or amenities are envisaged in the process of development of the proposed project.

5.4 Impacts on Road Safety and Human Health

The planning and designing of the project road is in accordance with the improved safety measures and better health conditions.

The chances of accidents could be minimized by (1) strengthening the pavements, (2) improving upon the curves in road geometrics, (3) grade separators (4) proposing the service lanes in market places and near schools, etc (5) providing proper median, (6) improving upon road crossings (7) putting right signals and signboards, (8) new under passes.

5.5 Mitigation Measures:

The project is likely to bring some negative impacts on the environment and socio-economic structure of the region. While deciding the alignment from environment point of view, some negative potential impacts are unavoidable. In such cases, adoption of mitigation measures is the only solution. Mitigation should be focused on achieving goals within clear timeframes. Use of SMART approach is recommended to evaluate the likely effectiveness of alternative mitigation strategies or measures. The SMART refers to measures that are Specific, Measurable, Achievable, Realistic and Timely.

Table 5.14Impacts and Mitigation Measures

Potential Impacts	Mitigation
Accidental spots can be reduced by providing proper signs and warnings, improvement of junctions, new under pass, fly-over etc.	• Proper provision of service roads, junctions, fly-over, under passes to be provided at appropriate places • Truck parking places • Medical facility to be provided (an ambulance fitted with all medical equipment and a doctor)
Sexually transmission diseases (STDs)	• Detected diseased person to be carried to the nearest city hospital • Preventive measures should be taken to check the spreading of STDs

6 CHAPTER-VI: ENVIRONMENTAL MONITORING PROGRAM

The purpose of the monitoring program is to ensure that the envisaged purpose of the project is achieved and results in desired benefits to the target population. To ensure the effective implementation of the Environmental Management Plan (EMP), it is essential that an effective monitoring program should be designed and carried out. The environmental monitoring program provides such information based on which management decision may be taken during construction and operational phases. It provides basis for evaluating the efficiency of mitigation and enhancement measures and suggest further actions that need to be taken to achieve the desired effect.

Objective of Monitoring Program

The Objectives of environmental monitoring program are-

- Evaluation of the efficiency of mitigation and enhancement measures;
- Updating of the actions and impacts of baseline data;
- Adoption of additional mitigation measures if the present measures are insufficient; and
- Generating the data, which may be incorporated in environmental management plan in future projects.

6.1 Environmental Monitoring

Environmental monitoring describes the processes and activities that need to take place to characterize and monitor the quality of the environment. Environmental monitoring is used in the preparation of environmental impact assessments, as well as in many circumstances in which human activities carry a risk of harmful effects on the natural environment. All monitoring strategies and program have reasons and justifications which are often designed to establish the current status of an environment or to establish trends in environmental parameters. In all cases the results of monitoring will be reviewed, analyzed statistically and published. The design of a monitoring program must therefore have regard to the final use of the data before monitoring starts.

6.2 Monitoring Parameters and Standards

The Environmental monitoring of the parameters involved and the threshold limits specified are discussed below: -

6.2.1 Ambient Air Quality Monitoring

The air quality parameters viz. Sulphur di-oxide (SO2), Oxides of Nitrogen (NOX), Carbon Monoxide (CO) and Particulate Matter (PM 2.5 & PM 10) shall be regularly monitored at identified locations from the start of the construction activity. The air quality parameters shall be monitored in accordance with the National Ambient Air Quality Standards.
The duration and the pollution parameters to be monitored and the responsible institutional arrangements are detailed out in the Environmental Monitoring Plan **Table-6.1.**

6.2.2 Noise Quality Monitoring

The noise levels shall be monitored at already designated locations in accordance with the Ambient Noise Quality standards. The duration and the noise pollution parameters to be monitored and the responsible institutional arrangements are detailed in the Environmental Monitoring Plan**Table-6.1.**

6.2.3 Water Quality Monitoring

Water quality parameters such as pH, BOD, COD, DO, Coliform, Total Suspended Solids, Total Dissolved Solids, Iron, etc. shall be monitored at all identified locations during the construction stage as per standards prescribed by Central Pollution Control Board and Indian Standard Drinking water specifications IS:10500 Quality Standards. The duration and the pollution parameters to be monitored and the responsible institutional arrangements are detailed out in the Environmental Monitoring Plan **Table-6.1.**

6.3 Monitoring Plans for Environment Condition

For each of the environmental components, the monitoring plan specifies the parameters to be monitored; location of the monitoring sites; frequency and duration of monitoring. The monitoring plan also specifies the applicable standards, implementation and supervising responsibilities. The monitoring plan for the various environmental condition indicators of the project in construction and operation stages is presented in **Table-6.1.**

Monitoring plan does not include the requirement of arising out of Regulation Provision such as obtaining NOC/ consent for plant site operation.

Table 6.1: Environment Monitoring Plan

Environmental Component	Project Stage	Monitoring					Institutional Responsibility	
		Parameters	Special Guidance	Standards	Location	Frequency	Implementation	Supervision
Air	Construction Stage	PM10, PM 2.5, SO_x, NOx, CO	Respirable Dust Sampler to be located 50 m from the plant in the downwind direction. Use method specified by CPCB for analysis	Air (P&CP) Act,1981 and its amendment	Hot mix Plant / Batching Plant. Stretch of the road where construction is in progress at the site. (Total 03 locations)	Three times in a year for two years (Excluding Rainy season)	Contractor through NABL approved monitoring agency	Environment Expert-AE/IE/PIU
	Operational Stage	PM10, PM 2.5, SO_x, NOx, CO	Respirable Dust Sampler to be located 50m from the plant in the downwind direction. Use method specified by CPCB for	Air (P&CP) Act,1981 and its amendment	As directed by the PIU (03 Project locations)	Three times in a year for two years (Excluding Rainy season)	P I U through NABL approved monitoring agency	P I U

Environmental Component	Project Stage	Monitoring					Institutional Responsibility	
		Parameters	Special Guidance	Standards	Location	Frequency	Implementation	Supervision
			analysis					
Water Quality	**Construction Stage**	Parameters as per IS: 10500 and standards of surface water	Grab sample collected from source and analyze as per Standard Methods for Examination of Water quality	Water quality standards by CPCB	01 drinking water sample- Labour Camp and 02 surface water samples in project stretch.	Three times in a year for two years (Excluding Rainy season)	Contractor through NABL approved monitoring agency	Environment Expert-AE/IE/PIU
Water Quality	**Operation Stage**	Parameters as per IS: 10500 and standards of surface water	Grab sample collected from source and analyze as per Standard Methods for Examination of Water quality	Water quality standards by CPCB	As directed by the PIU (03 Project locations)	Three times in a year for two years (Excluding Rainy season)	P I U through NABL approved monitoring agency	P I U
Noise Levels	**Construction Stage**	Noise levels on dB (A) scale	As per CPCB	Noise standards by CPCB	Hot mix Plant / Batching Plant. Stretch of the road where construction is in progress at the site. (Total 03 locations)	Three times in a year for two years.	Contractor through NABL approved monitoring agency	Environment Expert-AE/IE/PIU
	Operation Stage	Noise levels on dB (A) scale	As per CPCB	Noise standards by CPCB	As directed by the PIU (Total 03 locations)	Three times in a year for two years.	PIU through NABL approved monitoring agency	PIU
Soil	**Co**	Turbidity in Storm	----	As per Standard	01 location construction	Three times in a	Contractor through	Environment Expert-

Environmental Component	Project Stage	Monitoring					Institutional Responsibility	
		Parameters	Special Guidance	Standards	Location	Frequency	Implementation	Supervision
		Water Silt load in ponds, water courses		(ICAR)	camp and 02 major construction locations. (Total 03 locations)	year for two years	NABL approved monitoring agency	AE/IE/PIU
	Operational Stage	Turbidity in Storm Water Silt load in ponds, water courses	----	As per Standard (ICAR)	As directed by the PIU (Total 03 locations)	Three times in a year for two years.	PIU through NABL approved monitoring agency	PIU

6.4 Environmental Monitoring Budget:

The environmental monitoring cost is estimated on the basis of the length and existing environmental scenario of the proposed project. Environmental monitoring cost of 9, 00,000/- is estimated for the construction and Operation stages. The details have been presented in Table -6.2.

Table 6.2: Environmental Monitoring Cost

Cot of Environment / Migration Plan Description	Unit	Quantity	Unit Rate	Cost
Air quality monitoring at 3 locations for 3 seasons for 2 consecutive years. (Construction Stage)	No.	18	9000	162,000
Air quality monitoring at 3 locations for 3 seasons for 2 consecutive years. (Operation Stage)	No.	18	9000	162,000
Water quality monitoring at 3 locations for 3 seasons for 2 consecutive years. (Construction Stage)	No.	18	7000	126,000
Water quality monitoring at 3 locations for 3 seasons for 2 consecutive years. (Operation Stage)	No.	18	7000	126,000

Cot of Environment / Migration Plan Description	Unit	Quantity	Unit Rate	Cost
Noise quality monitoring at 3 locations for 3 seasons for 2 consecutive years. (Construction Stage)	No.	18	3000	54,000
Noise quality monitoring at 3 locations for 3 seasons for 2 consecutive years. (Operation Stage)	No.	18	3000	54,000
Soil quality monitoring at 3 locations for 3 seasons for 2 consecutive years. (Construction Stage)	No.	18	6000	108000
Soil quality monitoring at 3 locations for 3 seasons for 2 consecutive years. (Operation Stage)	No.	18	6000	108000
Total				**900000**

7 CHAPTER-VII: ADDITIONAL STUDIES

Additional Studies has been carried out based on local consultation and discussion. The different additional studies carried out for the project comprising of R & R study, Safety study, SIA study etc. The study also covers all other aspects within this project location and makes a plan to reduce the issues based on consultation of local community, department and nodal officer's recommendations.

7.1 Local, Public & Other Stakeholders Consultation

These consultations were held at major settlement areas along the project to inform people about the objectives of the project. Such consultations provided a means to get the opinion of the people and their issues of concern. The focused group discussion and interview survey methods were adopted as tools for community level consultations. In each of the consultation, participants were encouraged to give their observations, suggestions and share experiences on various environmental and road safety issues and suitable mitigation.

Public involvement is one of the most important methods for the success of any project. It is useful for gathering environmental baseline data, understanding likely impacts, determining community and individual preferences, selecting the alternative and for designing sustainable mitigation and compensations plans.

The guiding principles include

(i) Dissemination of information: - The information regarding the proposed project should be disseminated to the project affected people directly and indirectly.
(ii) Soliciting information: - The basic information regarding various environmental and socio-economic issues is solicited.
(iii) Consultation: - The consultation involves engaging people in dialogue. There has to be a continuous dialogue between the components of the project and the public.

The public consultations are held at all the stages, namely, inception, screening, feasibility, and EIA preparation.

OutcomeofConsultations

Following are the key issues emerged during public consultations during field Study:

- ☞ The proposed project should have adequate road safety measures including service roads, traffic signal etc. to minimize increasing road accidents.
- ☞ Adequate provision of drainage should be made for catering runoff from surrounding areas as well.
- ☞ Tree cutting should be minimized.
- ☞ Traffic noise is particularly disturbing for schools, residential complex, hospitals located near to project and appropriate mitigation measures are required.
- ☞ Appropriate pollution control measures are required during construction phase.
- ☞ Provision of noise barriers for sensitive noise receptors like school and colleges.
- ☞ Provision of bus stops with kiosk facilities and landscaping.
- ☞ Provision for adequate tree plantation should be made to compensate tree cutting.

7.2 Social Impact Assessment (SIA) And R&R

The Social Impact Assessment study of the project National Highway has been carried out as per terms of reference of NHAI and guidelines given by the Govt. of India. The study methodology employs a simplistic approach in which the important receptors were identified. Based on the identification, secondary baseline data were collected and then analyzed to predict the impacts and quantify them. A detailed Social Assessment has been carried out to identify nature and characteristics of losses to individuals and local communities because of the proposed project interventions. The report prepared which gives detailed impacts of the project. A census survey of Project-Affected Persons (PAPs) was carried out along with the land resource survey of the project area. To establish impacts on people and community a resource mapping on strip map and consultation with individuals, communities and other stakeholders were done. Based on the findings of this survey and consultation with project-affected persons and other stakeholders a social impact assessment report is prepared.

7.3 Introduction

Public consultations or community participation is an integral part and process of any project which involves resettlement or rehabilitation issues. It helps to incorporate valuable indigenous suggestions and perceptions of development. In the process, stakeholders get the opportunity to address issues, which are resolved after making appropriate changes in design and alternative finalization. The stakeholders become aware of the development schemes and at the same time influence and share the control over these initiatives, decisions and resources. Community consultations also help to avoid opposition to the project, which is otherwise likely to occur.

During the course of the social impact assessment, consultation meetings were held to inform the communities and population about the positive as well as negative impacts of the road improvement scheme. Public Consultations were held along the subproject with the local persons who will be benefitted from the project and other stakeholders of the sub project reveals that each person are interested in early completion of the project which will benefit all the stakeholders.. Focus group discussions were held with the youth's group, women's group, farmers, shopkeepers, tenants, interest groups and organisation. Key Informant Interview took place with the village head men, gram panchayat members, head of households and important personalities. There was special consultation with the individual women, vulnerable affected persons and tribal persons. These meetings were used to get wider public input from both the primary and secondary stakeholders.

7.4 Stakeholders Identification & Analysis

The stakeholders are all the people getting affected by the project or are responsible for the project, whether directly or indirectly. Primary stakeholders included those affected negatively or positively by the project, like the project beneficiaries and project implementing agencies. Secondary stakeholders included other individuals and groups, with an interest in the project, viz., the town/urban road users, Government Stakeholders and the line departments

7.5 Focus Group Discussion (FGD)

A focus group discussion is held involving local people to discuss the project. It is a form of qualitative research where questions are asked about their perceptions attitudes, beliefs, opinion or ideas. In focus group discussion participants are free to talk with other group

members; unlike other research methods it encourages discussions with other participants. Keeping the present Covid-19 situation in view, it was advised by the Block Development Officer to organize Public Consultation with less than 15 persons at any point of time. The group's composition and the group discussion should be carefully planned to create a non-intimidating environment, so that participants feel free to talk openly and give honest opinions on that particular project. Since participants are actively encouraged to not only express their own opinions, but also respond to other members and questions posed by the leader, focus groups offer a depth, nuance, and variety to the discussion that would not be available through surveys.

Additionally, as FGDs are structured and directed, but also expressive, they can yield a lot of information in a relatively short time. Therefore, FGDs are a good way to gather in-depth information about a community's thoughts and opinions on that specific project.

7.6 Need and Usefulness of Focus Group Discussion (FGD)

FGDs involve organized discussion with a selected group of individuals to gain information about their views and experiences on the project. It is particularly suited for obtaining several perspectives about the same topic. Therefore, FGDs help in gaining insights into people's shared understanding of everyday life and the ways in which individuals are influenced by others in a group situation. Moreover, the role of the moderator/convenor is very significant, as good levels of group leadership and interpersonal skill are required to moderate/convey a group successfully.

During FGD, free and open discussion among the respondents results in generation of new ideas that can be very useful for decision-making on that specific project. A focus group is not static. The moderator/convenor can bring any changes, remaining within the Scope of Work, in order to better facilitate the discussion during the group discussion. This dynamism allows better results in terms of information derived by a focus group. Expressions other than those in verbal form such as gestures and stimulated activities can provide researcher with useful insights on that particular project.

7.7 Objectives

The community participation programmes in social impact assessment ensured that information is disseminated to all the PAPs and other stakeholders in appropriate ways. The information dissemination has taken place in vernacular, giving details about the main project features and the entitlement framework.

Due consideration has also been given to address the views of the vulnerable groups. The Census/Survey Team carried out preliminary consultations through Focus Group Discussions (FGDs) and meetings with the PAPs as well as the general public in the project area. The local Panchayat leaders were informed through the PIU and the date and venue of the Public Consultation were fixed.

Several informal FGDs were conducted primarily in settlements with problems of traffic congestion, dense informal/squatter settlement, close junctions and road intersections, and concentration of PAPs. During the survey, intensive discussion and consultation meetings were conducted with the individuals in every affected localitywherein policy related issues; displacements and other related issues were discussed. Suggestions and comments by PAPs

were incorporated in the project road design as well as the policy measures for resettlement management.

Second round of Public Consultations will be conducted at important points, where people could assemble in large numbers. Town Council members will be contacted to inform the people beforehand. The PIU will be informed to organize formal consultations and the consultant team will also organize informal meetings with Town Council member and other distinguished persons, leaders of local level organization /association, trucker's association, and village women's groups.

7.8 Level of Discussion

A detailed public consultation was organized with the people's representatives, shopkeepers, businessmen, and others regarding the project benefits and vis-à-vis estimated loss. The main point of discussions were minor realignments to save certain structures, compensation and assistance, road safety etc. It has been observed that the benefits of the proposed project area acknowledged by the local people but they want the Executing Agency to take care of the implementation of the project to bring about promised benefits with proper safety measures.

The information and recommendations gathered from the various stakeholder consultations has been incorporated into the design of the project to ensure that the investments align with local priorities and development plans, and that they will deliver equitable socio-economic benefits to the intended project beneficiaries.

Due to the extreme Pandemic situation in the whole world, the PIA is not an exception. There is lockdown, social distancing and various conditions that are not conducive for Public Consultation. As per the guidelines only five persons could be called for Consultation at Panchayat Office thus those are the Public Representatives and the Public Consultation is rather Key Informant Interview in Nature. Informal FGDs have been done at the villages, market place and other common places to gather and disseminate information about the proposed project.

Still there might be persons who could not be informed or not satisfied with the present information, for them a special system is introduced by the survey team. One email address and one dedicated mobile number which is shared with the leaflets for satisfying mainly the PAPs and the locals regarding any queries or complain.

Table 7.1: Brief Description of some sample Public Consultation

Date / Place	No of Participants	Major Issues	Agreed upon	Mitigation Measures - Input to technical Design

Date / Place	No of Participants	Major Issues	Agreed upon	Mitigation Measures - Input to technical Design
Place: JrisaleinKhliehlangsha Road, Date: 01/09/2021	Total-2 Male-2 Female-0	The town is basically a trading hub. The cultivators as well as the traders are concern of selling their agricultural and industrial output at proper price Though the town lacks in many infrastructural facilities, but they think that with better communication there would be economic development their prosperity. All other issues would be solved automatically. As this proposed road is the only communication to the outer world, they want the road to be completed within schedule time.	The road after constructed would have major impact on both the economic and social life of the locals of the area.	The road is expected to be completed by two years.
Place: Approach Road to Jail Complex, Date: 01/09/2021	Total-4 Male-3 Female-1	The livelihood loss of the people is apprehended. The local people want some jobs of unskilled labour and petty supplier to the Civil Contractor. The local were positive about development. As per the suggestions received through public consultation, the proposed project and its benefits is the only feasible option for development of the area.	The proposed road project is the only feasible option for development.	The people agreed to cooperate and help in all possible ways for the successful of the project.
Place: Approach Road to Meecl, Date: 01/09/2021	Total-5 Male-4 Female-1	The existing alignment passes through the town area. It is also a junction town and many Goods vehicles passes through the town. There are both commercial and residential establishments along the alignment. As the proposed road will allure the motorist to drive fast there would be increase in road accident	Combined effort of the local authorities with the Government officials as well as the other stake holders would remove all the obstacles for development. Road Safety will be look after	The local authorities also assured that they would help in development of road project. Road safety awareness campaign should be made at schools. There would ample signage and other road furniture to reduce the accident.

Date / Place	No of Participants	Major Issues	Agreed upon	Mitigation Measures - Input to technical Design
Place: Lulong College Road. Date: 01/09/2021	Total-5 Male-3 Female-2	A detailed public consultation was organized with the potential project affected persons, people's representatives, shopkeepers, businessmen, and others regarding the project benefits and vis-à-vis estimated loss. The most important topic of discussion was the alignment which passes through the two-market complex, which is fully affected. The residents with their representatives all disagree in demolishing of the market complex, partially or fully.	The local people had agreed in the view of the proposed road project which will bring some hope to the movement of the heavy vehicles and development of the area but against any damages to the market structures.	The PWD officials had agreed to take special care for traffic movement and road safety. It was assured that there would be no damages of any structures at the market place
In addition to the above specific public consultations and FGDs the peoples were also consulted. In the villages the impact of social and economic are more. In all the villages the access to the market would increase and based on this the valuation of land and properties would also increase.				

Table7.2Pictures of First Stage Consultations

		Existing Electric pillars on the project road causing hindrance to smooth flowing of traffic. Place: JrisaleinKhliehlangsha Road Dated: 01/09/2021 .
Building materials dumped on the project road resulting in narrowing of the existing road. Place: JrisaleinKhliehlangsha Road Dated: 01/09/2021		

		Existing condition of the present road. Place: Khimusniang Internal Road (Opposite Khimusniang Presbyterian Church) Dated: 01/09/2021
Upgradation of this earthen portion of the project road is proposed by the local people. Place: Approach Road to Jail Complex Dated:01/09/2021.		
		Squatters have been identified on different places on the project road. Place: Approach Road to Meecl Date: 30/08/2021
Renovation of bridge should be on top of the priority list as urged by the local commuters. Place: Lulong College Road. Dated: 01/09/2021.		

7.9 Outcome of the Consultations

People were aware about the improvements proposed for the project road but were not aware about specific details of the PRoW, shift in centerline and the method of valuation for land and building, payment of compensation and other rehabilitation and resettlement measures. A detailed public consultation was organized with the potential project displaced persons, people's representatives, shopkeepers, businessmen, and others regarding the project benefits and vis-à-vis estimated loss. The main point of discussions were minor realignments to save certain structures, compensation and assistance, road safety etc. It has been observed that the benefits of the proposed project area acknowledged by the local people but they want the Executing Agency, to take care of the implementation of the project to bring about promised benefits with proper safety measures.

The information and recommendations gathered from the various stakeholder consultations has been incorporated into the design of the project to ensure that the investments align with local priorities and development plans, and that they will deliver equitable socio-economic benefits to the intended project beneficiaries. The salient points of the consultations are summarized in the following Table 7.3

Table 7.3: Summary of Consultation Outcome

Issues Discussed	Outcome
Relocation Options Compensations/Assistance	Displaced Persons whose residential structures are getting affected temporarily prefer not to get disturbed and if disturbance is not avoidable then they shall be relocated very nearby. Shop owners and workers raised the issue of loss of their livelihood during the resettlement period due to loss of business. During consultation they were convinced that there will be no permanent impact but temporary impact during the active construction period.
What are all the facilities provided through this project and to whom should we approach?	Facilities like bus shelters, rest rooms, pavements, drains etc would be provided. Officers such as PWRD Engineers, LARR Authority/Town Councilcould be approached for grievances.
Safety due to alignment	People expressed their views on the risk if the road is widened at the dense settlement area affecting structures on both sides. During consultation they were convinced that there will be no permanent impact but temporary impact during the active construction period.
Could you inform us the time when our assets be removed?	Would be informed well in advance and compensation will be paid before vacating assets, if required.
Relocation of school buildings Relocation of Bus shelter/CPR	The sites for relocation of schools and CPR were identified in consultation with the villagers and the village Headman was carried out. There were differences in opinions among the villagers in demolishing/ shifting the Bus shelter. Presently there is no impact at any CPRs.
Cross Drainage for alignment	People have shown their concern for the proposed drainage pattern for the alignment of a portion of the project road. In this regard the lined rectangular drains with proper outfall shall be planned as a part of the project design of the main carriageway. Adequate cross drainage structures are planned after study of hydrology of the Survey area.
Utilities and basic infrastructures	People showed their concern about what will happen with the utility lines if the road is widened. Adequate care shall be taken for the shifting of the utilities.
Employment during	People were of demand if the local people are given preference for

Issues Discussed	Outcome
construction	employment during the construction phase of the project. Such options shall be explored to the extent possible and mostly the unskilled worked can be hired from nearby locality.
Why structures at places along the road were not measured?	If and only the structure to be impacted, measurements are required. Otherwise, there is no requirements of measurements of structures.
What about the loss of livelihood during active phase of construction?	The active phase of construction is planned in such a way that there will be minimum (temporary) loss of access and/or livelihood. If there is any loss or damage of structures or any immovable assets the Civil Contractor will compensate the same in discussion with the affected party.Civil Contractor will minimize the impact of accessibility of the residential structures and the loss of livelihood of the Commercial structures will be minimized by speeding up the civil work and doing the work on one side of the road at a time

8 CHAPTER-VIII: RESETTLEMENT ACTION PLAN

The Resettlement Policy Framework (RPF) provides a guide the preparation of the Resettlement and Rehabilitation Action Plan (R&R Action Plan) depending upon the scale and severity of impacts that may arise, temporary or permanent land acquisition or resettlement and rehabilitation is inevitable. Thus, the objective of the RPF is to ensure that the Project Affected Persons (PAPs) get compensation for their loss, are offered resettlement measures, and are supported in improving or at least restoring their levels of living and income after the project impact to pre-project levels. The RPF is intended to safeguard the interests of the population impacted by the project, especially the poor and vulnerable. The RPF is based on applicable Policies of GoI, State government (herein Govt. of Meghalaya) and the World Bank.

As there is no scope of land acquisition and the RoW is free from all encroachments and encumbrances in the project area. As per the guidelines of World Bank there will be only ESIA . No Resettlement Plan or Abbreviated Resettlement Plan is envisaged at this stage.

9 CHAPTER IX Tribal People's Development Plan

The Tribal People in India are categorized as indigenous community who often become vulnerable indevelopmentprojectsbecauseoftheirculturalautonomy,economicstatus,andenduringspecific disadvantages in terms of social indicators of quality of life, thus usually as subject of social exclusion. Because tribal communities live within varying and changing historical, cultural, political and economic contexts, no precise and coherent term has been found to define them. Under OP 4.10, the determination as to whether a group is to be defined as indigenous peoples is made by reference to the presence (in varying degrees) of four identifying characteristics:

There is no impact on the community structure or community land of cultural or religious sentiment of the ST Population in the Primary PIA. The proposed project will ensure that STs receive culturally appropriate social and economic benefits, do not suffer adverse impacts as a result of projects, and can participate actively in projects that affect them. There is no cultural heritage site of the ST which comes in the way of the road alignment. The ST population among the Surveyed Families in the PIA are living in the towns and intheduecourseoftimebecamethepartofthemainstreampopulation.PresentlytheimpactedSTpopulationdoesnotfollowanycustomsthatareattachedtotheirlandornaturalhabitatwhichwillbeimpacted. Thus, there will be no cultural or social impact on the ST population.

10 CHAPTER X Gender Action Plan

The tribes of Meghalaya whose societies are organized on matrifocal principles have obtained much greater gender equality than the societies (e.g. Hindu and Muslim) that are organized on the patriarchal principles. answered, "Securing equal treatment for men and women in the workplace."

A culturally appropriate and gender-sensitive assessment was carried out for social impacts to assess the potential project impacts, both positive and adverse, on gender issues. It was identified that social and economic benefits for the town dwellers which are culturally appropriate, gender and inter-generationally inclusive and develop measures to avoid, minimize, and/or mitigate adverse impacts on Gender. Suggestion of noise barrier, reduction of dust, providing employment of the female members as unskilled labourers during construction were the results of the focus group discussions.

10.1 Monitoring Gender Action Plan

The indicators, frequency, and agency recommended for monitoring are presented in the table below.

Table 8.1: Monitoring Indicators for Gender Action Plan

Aspects	Monitoring Indicators (Process and Outcome)	Frequency	Monitoring Responsibility

Aspects	Monitoring Indicators (Process and Outcome)	Frequency	Monitoring Responsibility
Economic	• No. of women engaged in different activities and their proportion to the total workforce; • Days of engagement of women in different wage / non-wage activities and proportional days of engagement in comparison to their male counterpart; • Growth in income of women due to such engagements; • Reduction in no. of days of migration (if migrating earlier); • No. of women having additional/new market oriented employable skills for self-engagement; • No. of women accessed different govt. schemes/provisions including beneficial enrolment in agricultural interventions; • Improvement in asset holding of women (productive and household assets).	• Planning Stage: for the base line data • Half yearly Monitoring • Mid Term Review (MTR) • Final Impact Assessment	PMU Third party Monitor along with PMU
Social	• Improvement of association of women in local institutional and decision- making process (membership, management position, etc.);	• Planning Stage: for the base line data • Half yearly Monitoring • Mid Term Review (MTR) • Final Impact Assessment	PMU Third party Monitor along with PMU

10.2 Road Side Safety Measures

Indian Road Congress (IRC) codes will be followed in proposing and designing road safety features. Pavement markings will be done for traffic lane line, edge lines and hatching. The marking will be with hot applied thermoplastics materials. The pavement markings will be reinforced with raised RR pavement markers and will be provided for median and shoulder edge longitudinal lines and hatch markings. Highway lightings including high masts will be provided at intersections in order to improve the night time visibility.

All the urban locations as well grade separated structure locations will be provided lighting arrangements.

10.2.1 Implementation Arrangements

The preparation, implementation, and monitoring of the Gender Action Plan (GAP) is the responsibility of the project implementing entities. The Social Development specialist, at the PMU level, will facilitate and supervise this process of preparation and implementation of the Action Plan. All efforts will be made to coordinate and work with associated line departments and other department, more specifically the Women and Child Development department, State Livelihood Mission, Panchayati Raj, and Rural Development department to help dovetailing with their development programs for the socio-economic development of women.

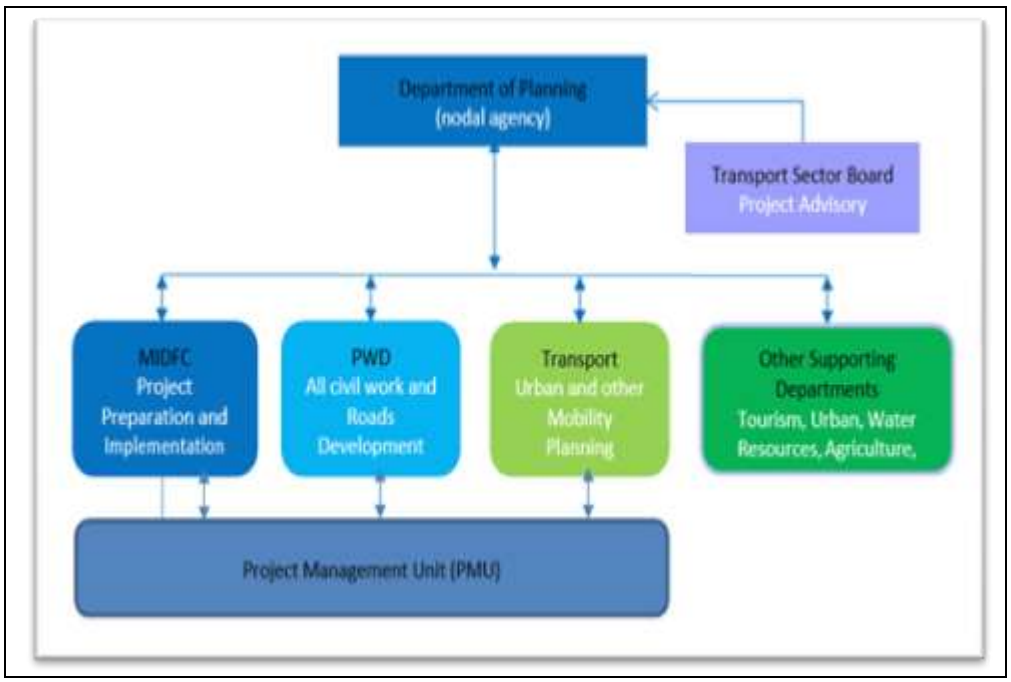
10.2.2 Implementation of ESMP and RAP

Due to is wide scope, the project activities will be implemented by many agencies: Public Works Department(PWD),UrbanAffairs(UA)Department,DepartmentofTourism,TransportDepartment and Community and Rural Development Department. Each of the mentioned departments, will depute a Project Director (PD) preferably at the level of a Chief Engineer/Superintending Engineer along with the required supporting staff with the overall responsibility for project implementation with the involvement of the various field divisions and other units at the head-quarters (HQ – Shillong).

PDs will work under the overall guidance and oversight of a Project Advisory Committee headed by the Secretary of the respective departments. In addition, nodal officers will be deputed from the beneficiary departments like Tourism, Agriculture, Police, Health, Education and C&RD. All civil works component will be implemented mainly by PWD, and involvement UA and Transport departments will be mainly for the technical assistance and pilot projects on improving mobility. When functional, the Transport Sector Board will also be constituted to provide high level policy guidance and oversight for project implementation.

Meghalaya Infrastructure Finance Development Corporation (MIFDC) set up under the Planning Department will be responsible for overall planning, coordination, implementation and monitoring of the project along with various departments. It will also be responsible for mobilizing private sector finance for the development works. The State Planning Department will be the nodal department for the Project. MIDFC will be responsible for overall planning and implementation of the entire project. It will ensure that ESIA is conducted and ESMPs are prepared and that the ESMF is followed during project implementation. Additionally, a project management unit (PMU) will be mobilized under MIDFC to support the implementing agencies during project preparation and subsequent implementation. The overall institutional arrangement for the implementation of the project is outlined in the following diagram.

Figure 8.1 Project Implementation Arrangement



10.2.3 Project Management Unit (PMU)

The Project Management Unit (PMU) will engage a consulting firm, as Project Management Consultant (PMC) for providing technical support to the project and facilitate implementation of project framed activities. The experts of the PMC will assist MIDFC in preparing and updating ESIA (includingE&SMPs).ThePMCwillalsoassistMIDFCinpreparingsemi-annualsafeguardsmonitoring reports. Specific roles of the PMC with regard to ESMF implementation would include the followings.

10.2.3.1 Preparatory Stage:

- Initial field visit to project sites and assessment of environmental and social aspects of project activities;
- Discussion with different stakeholders, including implementing agencies on safeguard measures and their expected role;
- Preparing / finalizing assessment framework in line with the Environment and Social indicators;
- Finalizing TOR of the contractors incorporating safeguard measures to be taken;
- Facilitate / organize training / workshops on safeguard measures for the stakeholders;
- Designing study / assessment tools for periodic assessment, its piloting and finalization.

10.2.3.2 Implementation Stage:

- Conductingperiodicsitevisitsandobservethemeasurestakenasperthesafeguardnorms;
- On the spot guidance to contractor/s / implementing agencies on safeguards;
- Preparation of site-specific reports and sharing with MIDFC;
- Documentation of learning cases for sharing and dissemination;
- Visual documentation of site-specific safeguard measures;
- Tracking activity specific environmental and social monitoring indicators;

- Organizing / facilitating refresher training courses for stakeholders;
- Monthly and quarterly progress report preparation and submission to MIDFC.

10.2.3.3 Post-Implementation Stage:

- Consolidation of periodic monitoringreports;
- Support in conducting environment and socialaudit;
- Consolidation of good practice documents and its submission toMIDFC;
- Final sharing workshop on environment and social safeguard practices and itsoutcome.

10.2.3.4 The PMU shall have following experts for implementation of ESMF and E&SMPs: Social cum Gender Expert

The Social cum Gender Expert at the PMU level will guide the overall process related to social and genderaspects.Thedistrict/sub-districtlevelimplementingagencieswillexecuteandmonitorthe social / gender components in consultation with the said Expert. She / he will be associated in the screening process of such activities that require acquisition of land and/or involvement of women and/or need special focus on tribal involvement. She/he will monitor the social processes followed in execution of the planned activities and realisation of the social / gender inclusion parameters. She / he will be looking after social / gender aspects of the project, including monitoring of social / gender indicators and coordinating with different agencies / institutions. The expert will be guided by the Project Director from MIDFC and reporting to the Project Directordirectly.

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10.2.3.5 Environmental Expert

The environment expertwilllookafterenvironmentalaspects.She/hewillguidetheprojectteam onenvironmentalaspectsandsupportinbuildingenvironmentalparameterstobebuiltinthebids.
She / he will also guide the contracts and monitor their works from time to time. In case of requirement, she/he will prepare a detail environment management plan for different activities to be executed by the project. The expert will be guided by the MIDFC Project Director and reporting to the Project Directordirectly.

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10.2.4 Capacity Building Strategy

The concerned officials within the project implementation agencies will be oriented on different social and environment aspects by which they will be equipped well to manage the related issues effectively and efficiently. The capacity building would take in to account the current issues that may influence the project activities, measures that are required to be taken to ensure greater involvementofsociallyandeconomicallybackwardfamiliesanddeprivedsectionsofthesociety.A capacity building plan on social and environmental aspects to be prepared by PMU in consultation with all implementingagencies.

10.2.5 Institutional Capacity to Manage Social Development Aspects

10.2.5.1 Autonomous District Councils

As mentioned earlier, ADCs were established under the Sixth Schedule of the Constitution of India (Articles 244(2) and 275(1)) with a view to preserve and protect tribal institutions. It is a system of local administration to give greater autonomy to tribal societies, to preserve and safeguard tribal groups' traditional practice and to act as a conduit between the formal state government and the informal grassroots tribal institutions. Moreover, the powers for the regulation and management of natural resources have been conferred on the Councils. Despite the fact that the District Councils manage and control the land, water and forest, the management of these resources is a weak link of the Councils. Due to their decisive role in local governance, the project aims to build their capacity in sustainable management and safeguarding of state's natural resources. The project will offer technical assistance, skill-development and financial resources to the ADCs, with the aim to empower them.

There are, at present, three ADCs in the state of Meghalaya, Khasi, Jaintia and Garo Hills Autonomous District Councils. They are constitutional bodies and all laws, rules and regulations made by them are enforceable. The ADC has the right to constitute village councils or courts for the trial of suits and cases between the parties all of whom belong to Scheduled Tribes within their own jurisdiction and may appoint suitable persons to be members of such village councils or presiding officers of such courts, and may also appoint such officers as may be necessary for the administration of the laws of the Sixth Schedule. They may also act as courts of appeal from the decisions made by village councils. As per paragraph 8 of the Sixth Schedule, the ADC also has the power to assess and collect revenue in respect of all lands within the district except those lands which are in the areas under the authority of regional councils, if any, in accordance with the standardfollowedbytheStategovernment.Italsohasthepowertolevyandcollecttaxesonlands and buildings, and tolls from persons, falling within their jurisdiction. The ADCs also has the power to make laws on matters such as inheritance of property, marriage and divorce as well as on social custom. Not withstanding the power and authority extended to the ADCs by the Constitution, in the matters as mentioned earlier, they are however, bounded by paragraph12(A) of the Schedule. This paragraph gives onus to the State laws over that of the laws made by the ADC. It states that if any law made by the ADC is repugnant to any provision of a law made by the State Legislature, then the formers' will be void and the State law will prevail.

10.2.5.2 Grassroots Institutions

The third centre of authority is the grassroots tribal institutions and practices. In the Khasi and Jaintia Hills, these are powers that rest at the village level's elected members to govern the village. The members mainly belong to the ruling clan called Ki Bakhraw. The elected members organise themselves into a village council or Dorbar Shnong that is headed by a Chief. The council has significant power and legitimacy rooted in the un-codified customary laws and practices. The primary function of the DorbarShnong is to undertake development works and to manage local assets. It also functions as a court trying petty cases such as land disputes. The decisions of the Dorbar are considered legitimate and are usually adhered to the Garo Hills, there is the institution of the Nokma. The Nokma holds a-king (clan) land in the village as head of the motherhood. As head, the Nokma is to preserve the customs but the real owner of the a-king land is in his wife's' name. The administration of the

village is carried out through by the Nokma. In the Garo Hills there are 70 village courts with a laskar. If there is no lascar a member of the village council nominated by the District Council. The lascar of the village is the ex-officio president of the Village Court. The President and Vice-President is elected by the members of the council from amongst themselves by a majority of votes. The Nokmas and the laskar try all cases connected to customary laws. The community led project will provide training and capacity building to all the traditional institutions and stakeholders based on traditional laws and the existing government Acts for the protection and management of land, water and forest.

10.3 Grievance Redressal Committee (GRC)

10.3.1 Grievance Redress Mechanism

Effective grievance redressal mechanism gives an opportunity to the organization to implement a set of specific measures to ensure good governance accountability and transparency in managing andmitigationofenvironmentalandsocialissueofaparticularproject.Thisconsistsofdefiningthe process for recording/receiving complaints and their redressal in respect of environmental and socialmatters.

An integrated system will be established with Grievance Redressal Cell (GRCs), with necessary officers, officials and systems at MIDFC. 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.

Thegrievanceredressmechanismshouldbeinplaceatthetimeofinitiatingtheimplementationof R&RAPandcivilconstructionactivitiesintheprojectarea.Aplatformforgrievanceredressalshould 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. Theproject,apartfromweb-basedmechanism,willhavethree-tiregrievanceredressalmechanism, i.e., (1) at the project site level, (2) State level (PMU level) and (3) Judiciarylevel.

Web based grievance mechanism[11]: In case of grievances received through toll free number or web-based system, a person should be made in-charge of screening and resolution of the same/communicatingwiththeconcerneddivisionsforresolutionofthesame.Thepersonin-charge based on nature of 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 within 15 days. If response is not received within 15 days, the complaint should be escalated to the ProjectDirector.

Tier I: Under this project, the local VECs and community level organizations will serve as the first-tiermechanismtohandlecomplaintsandgrievances.ThelocalHeadmanwillbethefocalpointwho will receive, address, and keep record of the complaints and feedbacks. The grievance focal point willfirstreviewthegrievancessubmitted.Ifgrievancesordisputescannotbesolvedattheir VEC's level within 30 days of the submission of the grievances, the issue will be brought to PMU level for mediation. PMU is expected to inform aggrieved persons or parties to disputes of the resolution in 30 days.

Tier II: If the aggrieved person is not satisfied with the verdict of site level grievance cell, he or she can escalate the grievance to state level grievance cell. The tier II cell will be under the ChairmanshipofSecretary,DepartmentofPlanning.TheothermemberswillincludeChiefEngineer

; Project Director and Social Expert of the Project. The second level of grievance cell will provide its view within 30 days of receiving thegrievance.

TierIII:Theaggrievedpersonifnotsatisfiedwiththeverdictgivenby Statelevelgrievancecell,will have the right to approach the Judiciary. Project will help the aggrieved person in all respect if person wants to approach the judiciary. This would include the District Commissioner and Legal courts. If the issue cannot be addressed or is outside the purview of the GRC, then it may be taken by the Office of the District Commissioner or a Legal Court.

10.3.2 Grievance management through Electronic Mode

A simplified mobile based technology feedback system can be used at community level to capture and feed data into the Management Information System of the PMU. A toll-free Helpline number will also be established to make the mechanism widely accessible and gender friendly.

10.3.3 Grievance Redressal Mechanism

There Grievance Redressal Committee (GRC) at the PMU level is in process of formation. Consultation for the formation of GRC for this project at city/ward level is currently being undertaken. Before the start of civil contractor appointment, the GRC at project level will be formed with consultation with the PAPs and Beneficiaries so that the grievances are resolved at the project site only. There should be a Women Cell at the PMU. The contractor and the other stakeholder's office will display the Vishaka Guidelines at their Notice board. The Women helpline Number should be displayed in the Bus Stand, Ticket Counter, all commercial vehicles and any other place as required.

Table 8.2 Details of contact for Grievances

Description	Contact details
Company:	PWD, Meghalaya
To:	Chief Engineer-cum-Project Director
Address:	HV9P+GFJ, Lachumiere, Shillong, Meghalaya 793001
E-mail:	cenhpwd@gmail.com
Website:	http://megpwd.gov.in/contacts.html
Telephone:	Tel: 0364-2224561
Fax:	-

10.3.4 Disclosure of Project Information

In order to make the ARAP implementation process transparent, salient features of ARAP shall be translated in Hindi and disclosed on the Project Authority's website. The documents available in the public domain will include ARAP (summary in Hindi) and the list of affected persons eligible for compensation and R&R assistance. Copy of all documents will be kept in PMU for ready reference. As per Access to Information Policy of the World Bank, all safeguard documents will also be disclosed and available at the World Bank's Portal.

11 CHAPTER-IX: MONITORING & EVALUATION

TheM&EframeworkofESMFisdesignedtoassesstheprogressandachievements againstthesaid managementplans–
bothEnvironmentandSocialaswellasotherplanssuchasR&R,TPP,andGAP. By providing a feedback loop, the M&E plans enable decision makers to take up mid-course corrections if required. The M&E framework is designed to measure the impacts that have taken place, ensure compliance with the legal obligations, evaluate the performance of the mitigation measures applied, and suggest improvements in management plans, if sorequired.
The M&E is to be undertaken at two levels:

- Monitoring and Evaluation of the ESMF application: i.e. the application and effectiveness of ESMF elements including screening, assessment, formulation and implementation of the ESMPs, monitoring, capacity building and institutional arrangements;and
- Monitoring and Evaluation of E&S management plans at each project site: i.e. to monitor the effectiveness of implementation of the identified mitigation measures, the environmental quality parameters and social management plans relevant to each projectactivity.

11.1 M&E of the ESMF application

ThePMU'sSocialcumGenderExpertandEnvironmentExpertwillundertakeongoingmonitoring of the ESMF implementation in order to identify issues, good practices and required actions. ReportsbasedonthemonitoringwillbepreparedbythePMUatleasteveryquarterandsubmitted to the Project Director. The reports will be shared with the other implementing agencies. The monitoring of the ESMF implementation will cover the followingaspects:
Screening of project activities:

- Hasthecategorizationoftheprojectactivitiesbeendoneaccuratelyandorchanged(Ato B)?
- Has the Environmental and Social Screening Checklist been used in all applicableactivities?
- Has the scoping for further assessment been done comprehensively for all applicable activities?

Monitoring of E&S aspects in project activities:

- Arethecontractorsandimplementingagenciesundertakingperiodicandregularmoni toring of the E&S implementation in the projectactivities?

Capacity building arrangements for management of E&S aspects:

- What training programs on E&S aspects have been organized for the staff of implement agencies?
- What training programs on E&S aspects have been organized for thecontractors?

11.2 M&E of E&S Management Plans

Monitoring and evaluation of the project is significant for achieving the project development objective(PDO)withinthestipulatedtimeperiod.Thekeyenvironmentalandsocialaspects,those that have been highlighted in each E&SMPs at site level are to be monitored periodically. The approvedE&SMPswillgivethedirectionandindicatethemilestonesachievedasperthenational/ statebenchmarks/norms.Thefollowingspecificenvironmentalandsocialparametersshouldbe quantitatively and qualitatively measured and compared over a period of time to understand the impacts.

The PMU through the respective district level offices of PWD will monitor all projects roads to ensureconformitytotherequirementsoftheESMF.Themonitoringwillcoverallstagesofplanning and implementation. The monitoring will be carried out through the safeguard compliance reports that will form a part of Quarterly Progress Reports (QPR) for all sub projects and regular visits by the Social cum Gender and Environmental specialists of thePMU.

11.3 Concurrent Monitoring

The PMU's Social cum Gender Expert and Environment Expert will undertake ongoing monitoring of the ESMF implementation in order to identify issues, good practices and required actions. ReportsbasedonthemonitoringwillbepreparedbythePMUatleasteveryquarterandsubmitted to the Project Director. The reports will be shared with the other implementingagencies.

The PMU will review these reports and identify technical, managerial, policy or regulatory issues with regards to the ESMF compliance. The identified technical issues will be duly incorporated. Policy and regulatory issues will be debated internally by PMU and the need for appropriate interventions will be determined. These interventions could include appropriate revision of ESMF in consultation with the Bank or suitable analytical studies to influence policy or programs of the state, if found necessary / warranted. The table below provides the milestones and process to be followed for monitoring at different stages of project:

Table 11.1 Monitoring Protocol

Milestones	Objectives	Process	Responsibility	Decision/Target/ Deliverable
Environment				
Social				
Sub- Project Screening	To approve categorization of proposed sub-projects	Discussions with implementing agencies to assess eligibility of project based on project's priorities and identify scope of project report Consultants to submit report along with proposed impact categorization	PMU and PIU	Decision to proceed ornot Identification of impactcategory
Sub- Project Appraisal	To ensure satisfactory compliance with	Detailed appraisal (including RAP, GAP and TPP where relevant), including site	PMU	Review report and decideto accept

Milestones	Objectives	Process	Responsibility	Decision/Target/ Deliverable
	SMF	visits/ investigations, ifnecessary, assess suitability of site,adequacy of safeguard measures, risk analysis and regulatory clearances). DPR to be submitted for approval		accept with modifications- reject and instruct to resubmit
Approval	Approvals from PMU	PIU to recommend to PMU PMU to review and approve	PIU and PMU	Approval of RAP, GAP and IPDP if required
Implementation of RAP, GAP and IPDP, Monitoring and Review	Ensure Implementation of agreed RAP, GAP and IPDP where applicable)	Prepare quarterly progressreports Schedule field visits as required Midterm and end term evaluation	PIU, PMU, NGO	Quarterly ProgressReport

ProjectmonitoringwillbetheresponsibilityofthePMUwhowillsubmitQuarterlyProgressReports. Thereportswillcomparetheprogressoftheprojecttotargetssetupatthecommencementofthe project. The list of impact performance indicators will be used to monitor project objectives. The socio-economic survey conducted will provide the benchmarks forcomparison.

11.4 Periodic Evaluation

An external evaluation of the safeguard implementation prepared for sub projects will also be undertaken twice during the implementation of the project – midterm and at the end of the implementation. During implementation, meetings will be organized by PMU inviting all PIUs for providing information on the progress of the project work.

Mid-term Assessment Study – this would be undertaken mid-way through the project to ascertain the progress achieved and any mid-course corrections which need to be introduced. It would include indicators to measure progress towards log frame goals and objectives.

End-Term Assessment Study – this will be undertaken at the end of the project period (around the time of project completion) and will assess the achievement of the project during the tenure.

11.5 Arrangements for Monitoring

Monitoring is an integral part of successful implementation of the ARAP activities. Internal monitoring will be carried out by the Social Development Expert, PMU and/or the ULB under the supervision of Project Director/Chairman of ULB. Data collected for monitoring activities shall be suitably analysed for project management's learning and experience. Key progress indicators (indicative) for monitoring ARAP implementation are as given below:

- disbursement of compensation and assistance to PAPs, if any
- establishment of grievance redressal mechanism (including processes and timeline for redressal of grievances),

- consultation meetings with PAPs and communities regarding resettlement and rehabilitation issues,
- 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.
- income restoration of affected persons,
- training of the interested PAPs
- grievance handling mechanism

Project monitoring will be the responsibility of the PMU who will submit Quarterly Progress Reports. The reports will compare the progress of the project to targets set up at the commencement of the project. The list of impact performance indicators will be used to monitor project objectives. The socio-economic survey conducted will provide the benchmarks for comparison.

11.6 PeriodicEvaluation

An external evaluation of the safeguard implementation prepared for sub projects will also be undertaken twice during the implementation of the project – midterm and at the end of the implementation. During implementation, meetings will be organized by PMU inviting all PIUs for providing information on the progress of the project work.

Mid-term Assessment Study – this would be undertaken mid-way through the project to ascertain the progress achieved and any mid-course corrections which need to be introduced. It would include indicators to measure progress towards log frame goals and objectives.

End-Term Assessment Study – this will be undertaken at the end of the project period (around the time of project completion) and will assess the achievement of the project during thetenure

12 CHAPTER-XI: PROJECT BENEFIT

Transportation/Highway projects are generally intended to improve the economic and social welfare of the people and the locality. The broad objective of the present project is providing four lanes facility to accommodate the rapid growth of traffic.

The proposed project would act as the prime artery for the economic flow to this region. It will enhance economic development, provide employment opportunities to locals, strengthen tourist development, ensure road safety and provide better transportation facilities and other facilities such as way side amenities. Vehicle operating cost will also be reduced due to improved road quality.

Overall improvement will be expected in project area in terms of:

- Improvements in the physical infrastructure and road access.
- Improvement in social services due to quicker and safe mode of transport
- Enhanced connectivity between rural & urban population which will benefit the all sections of the society like general population, small-medium-large scale industries, farmers, businessmen etc.
- Reduction in pollution, vehicle maintenance costs, fuel usage due to free flow of traffic
- Employment potential for skilled, semi-skilled and unskilled labour, during construction and operational phases of the project, with specific attention to employment potential of local population as well as necessity for imparting any specialized skills to them to be eligible for such employment in the project
- Over-all development in economy in terms of industry and improved lifestyle
- Minimize road accidents by increasing road widths.
- Minimize the travel time.
- Better connectivity to economic, social and political hubs of Meghalaya.
- Better approach to medical, educational and essential services.
- Faster transportation of perishable goods like fruits, vegetables, and dairy products.
- Better opportunities for transporting, processing and marketing of agricultural products.
- Development of tourism and pilgrimage.
- Opening up of opportunities for new occupations and trade on the route.
- Improved road connectivity helps in better implementation and management of government schemes.
- National highways connect capitals, important places, ports and places of strategic importance of various areas.
- The construction of the project road in the state of Meghalaya will ensure smooth flow of the traffic. Installation of proper road safety system through signage, barricades, and crash barriers will add to be safety to the traffic.

- Vehicle Operating Cost (VOC) will be reduced when the National Highway is constructed. Fuel consumption, wear and tear of tyres, suspension will be benefited when a geometric of the road is improved. VOC consist of the following components.
  - ✓ Fuel consumption
  - ✓ Lubricating oil consumption
  - ✓ Spare part consumption
  - ✓ Tyre consumption
  - ✓ Vehicle depreciation

13 CHAPTER-XII: ENVIRONMENT AND SOCIAL MANAGEMENT PLAN

The environmental and social management measures shall be implemented during the various stages of the project viz: Pre-construction Stage, Construction Stage and Operational Stage. The environmental and social management plan for the project is described below.

13.1 Objectives of ESMP

The Environmental Social Management Plan (ESMP) consists of a set of mitigation, monitoring and institutional measures to be taken during the design, construction and operational phases of the project to eliminate adverse environmental impacts, to offset them, or to reduce them to acceptable levels. The main aim of the Environmental Management Plan is to ensure that the various adverse impacts are mitigated and the positive impacts are enhanced. A description of the various management measures against each activity suggested for construction stage is provided in this chapter.

13.2 Pre-Construction Stage

13.2.1 Pre-construction activities by PIU/Independent Consultant

Prior to the contractor mobilization, the PIU will ensure that a hindrance free corridor is handed over to enable the start of construction work. Clearance involves for the following activities:

- Felling and removal of trees (If any), which should be minimal with due permission.
- Relocation of common property resources and community assets like temples, telephone poles, electric poles and hand pumps etc (If any);
- Modification (if any), of the contract documents by the Engineer of the Independent Engineer.

13.2.2 Pre-construction activities by Contractor

- Pre-construction stage involves mobilisation of the contractor and the activities undertaken by the contractor pertaining to the planning of logistics and site preparation necessary for commencing construction activities. The activities include:
- Joint field verification of EMP by the Environment Expert of the Independent Engineer/Authority Engineer and Contractor.
- Identification and selection of material sources (quarry and borrow material, water, sand etc).
- Procurement of construction equipment / machinery such as crushers, hot mix plants, batching plants and other construction equipment and machinery.
- Selection, design and layout of construction areas, hot mix and batching plants, labour camps etc.
- Apply for and obtain all the necessary clearances/ NOC's/ consents from the agencies concerned.

- Planning traffic diversions and detours including arrangements for temporary land acquisition (if required).

13.3 Construction Stage

13.3.1 Construction activities by the Contractor

Construction stage is the most crucial stage in terms of activities that require careful management to avoid environmental impacts. There are several other environmental issues that have been addressed as part of good engineering practices, the costs for which have been accounted for in the Engineering Costs.

13.3.2 Construction activities by the PIU/ Authority Engineer / Independent Consultants

The PIU/Independent Engineer shall be involved in the smooth execution of the project and assisting the contractor during this phase. Their work shall include but not limited to:

- Monitoring and guiding the contractor on adopting good environmental and engineering practices;
- Arranging training to the contractor and other stakeholders according to the needs arising; and
- Implementation of Environment Management and Monitoring Plan.
- Making changes in the design if need so arises.

13.4 Operation Stage

The operational stage involves the following activities by PIU:

- Monitoring of environmental conditions through approved monitoring agency; and
- Monitoring of operational performance of the various mitigation/enhancement measures carried out.

Table 12.1: Environment Management Plan (EMP)

Sl. No.	Environmental Issue	Management Measures	Location	Responsibility	
				Planning and Execution	Supervision/Monitoring
PRE-CONSTRUCTION STAGE					
P1	Alignment,	The alignment as finalized by shifting / adjusting the centerline of the road, adopting of suitable cross-sections and adjustment of the median width to minimize land acquisition, loss of settlements and to avoid environmentally sensitive features compatible with project activities.	Throughout Corridor	PIU, Revenue Dept. NGOs Collaborating Agencies	**-**
P2	Land Acquisition	No Land Acquisition is envisaged PIU has to ascertain that any additional environmental impacts resulting from acquisition of land are addressed and integrated into the EMP and other relevant documents.	Throughout Corridor	PIU, Revenue Dept. NGOs Collaborating Agencies	-
P3	Preservation of	All efforts will be made to preserve	Throughou	PIU	

Sl. No.	Environmental Issue	Management Measures	Location	Responsibility	
				Planning and Execution	Supervision/Monitoring
	Trees	trees including evaluation of minor design adjustments/ alternatives to save trees. Specific attention will be given for protecting giant trees, and locally important trees (religiously important etc.). Tree cutting (if required) is to proceed only after all the legal requirements including attaining of In-principle and formal Clearances from the Forest Dept./ MoEF& CC are completed and subsequently a written order is issued to the Contractor.	t Corridor	Forest Department Contractor	
P4	Relocation of Utilities and Common Property Resources (CPR)	All utilities and CPRs i.e., water supply lines (If any) will be relocated before the construction starts. The PIU will relocate these properties in consultation and written agreement with the agency/ owner/community.	Throughout Corridor	PIU Concerned Agencies Contractor	
P5	Orientation of Implementing Agency and Contractors	The PIU shall organize orientation sessions and regular training sessions during all stages of the project. This shall include on-site training (general as well as in the specific context of the sub-project). These sessions shall involve all staff of Authority Engineer, field level implementation staff of PIU and Contractor. The contractor will ensure that his staff including engineers, supervisors and operators attend the training sessions.	Throughout Corridor	PIU Concerned Agencies Contractor	
P6	Joint Field Verification	The Environmental Expert of AE and the Contractor will carry out joint field verification to ascertain any additional possibility to saving trees, environmental and community resources. The verification exercise should assess the need for additional protection measures or changes in design/ scale/ nature of protection measures including the efficacy of enhancement measures suggested in the EMP. Proper documentation and justifications/reasons shall be maintained in all such cases where deviation from the original EMP is proposed.	Throughout out Corridor	Contractor and Environmental Expert of AE	PIU
P7	Assessment of Impacts due to Changes/Revisions/Additions in	The Environmental Expert of AE will assess impacts and revise/ modify the EMP and other required sections of the project documents in the event of	Throughout out Corridor	Contractor Environmental Expert of AE	PIU

Sl. No.	Environmental Issue	Management Measures	Location	Responsibility	
				Planning and Execution	Supervision/Monitoring
	the Project Work	changes/ revisions (including addition or deletion) in the project's scope of work.			
P8	Crushers, Hot-mix plants and Batching Plants Location	Hot mix plants and batching plants will be sited sufficiently away from settlements and agricultural operations or any commercial establishments. Such plants will be located at least 1 Km away from the nearest village/ settlement preferably in the downwind direction. The Contractor shall submit a detailed layout plan for all such sites and approval of Environmental Expert of AE/PMC shall be necessary prior to their establishment. Arrangements to control dust pollution through provision of windscreens, sprinklers, and dust encapsulation will have to be provided at all such sites. Specifications of crushers, hot mix plants and batching plants will comply with the requirements of the relevant current emission control legislations and Consent/NOC for all such plants shall be submitted to the "PIU through Environmental Expert of AE/PMC. The Contractor shall not initiate plant/s operation till the required legal clearances are obtained and submitted. The engineer will ensure that the regulatory and legal requirements are being complied with.	Throughout Corridor	Contractor	Environmental Expert of AE and PIU
P9	Other Construction Vehicles, Equipment and Machinery	• All vehicles, equipment and machinery to be procured for construction will confirm to the relevant Indian Standard (IS) norms. The discharge standards promulgated under the Environment Protection Act, 1986 will be strictly adhered to. • Noise limits for construction equipments to be procured such as compactors, rollers, front loaders concrete mixers, cranes (moveable), vibrators and saws will not exceed 75 dB (A), measured at one meter from the edge of the equipment in free field, as specified in the Environment (Protection) Rules, 1986. • The Contractor shall maintain a record of PUC for all vehicles and machinery	Throughout Corridor	Contractor	Environmental Expert of AE and PIU

Sl. No.	Environmental Issue	Management Measures	Location	Responsibility	
				Planning and Execution	Supervision/Monitoring
		used during the contract period, which shall be produced for NH verification whenever required. • Mobile equipment shall be placed at least 100 m away from the nearest dwelling.			
P10	Borrow Areas	• Finalizing borrow areas (if required) for borrowing earth and all logistic arrangements as well as compliance to environmental requirements, as applicable, will be the sole responsibility of the contractor. • The Contractor will not start borrowing earth from selected borrow areas until the formal agreement is signed between landowner and contractor and a copy is submitted to the PIU/Environmental Expert of AE through the Engineer. • Locations finalized by the contractor shall be reported to the Environmental Expert of AE and who will in turn report to PIU. • Planning of haul roads for accessing borrow materials will be undertaken during this stage. The haul roads shall be routed to avoid agricultural areas as far as possible (in case such a land is disturbed, the Contractor will rehabilitate it as per Borrow Area Rehabilitation Guidelines) and will use the existing village roads wherever available. • In addition to testing for the quality of borrow materials by the AE, the environmental personnel of the AE will be required to inspect every borrow area location prior to approval • The AE will make sure that each such site is in line with IRC and other project guidelines. • Necessary clearances need to be obtained prior to operation of Borrow areas.	Along the Project Influence Area	Contractor	Environmental Expert of AE and PIU
P11	Quarry	• Contractor will finalize the quarry for procurement of construction materials after assessment of the availability of sufficient materials, quality and other logistic arrangements. • In case the contractor decides to use quarries other than recommended by DPR consultants, then it will be selected based on the suitability of the materials and as per established law.	Along the Project Influence Area	Contractor	Environmental Expert of AE and PIU

Sl. No.	Environmental Issue	Management Measures	Location	Responsibility	
				Planning and Execution	Supervision/Monitoring
		• The contractor will procure necessary permission for procurement of materials from Mining Department, District Administration and State Pollution Control Board and shall submit a copy of the approval and the rehabilitation plan to the PIU through Engineer. • Contractor will also work out haul road network and report to Environmental Expert of AE and will inspect and in turn report to PIU before approval.			
P12	Arrangement for Construction Water	• To avoid disruption/disturbance to other water users, the contractor will extract water from fixed locations and consult the Environmental Expert of AE before finalizing the locations. • The contractor will not be allowed to pump from any irrigation canal and surface water bodies used by community. • The contractor will need to comply with the requirements of the State Ground Water Department and seek their approval for doing so and submit copies of the permission to AE and PIU prior to initiation of any construction work.	Along the Project Road	Contractor	Environmental Expert of AE and PIU
P13	Labor Requirements	• The contractor preferably will use unskilled labor from local communities to give the maximum benefit to the local community.	Along the Project Area	Contractor	Environmental Expert of AE and PIU
P14	Construction Camp Locations – Selection, Design and Lay-out	• Sitting of the construction camps will be selected by the contractor as per the guidelines. • Construction camps will not be proposed within 500 m from the nearest settlements to avoid conflicts and stress over the infrastructure facilities with the local community. • Location for stockyards for construction materials will be identified at least 1000 m from watercourses. • The waste disposal and sewage system for the camp will be designed, built and operated such that no odor is generated.	Along the Project Road	Contractor	Environmental Expert of AE and PIU
P15	Arrangements for Temporary Land Requirement	• The contractor as per prevalent rules will carry out negotiations with the landowners for obtaining their consent for temporary use of lands for construction sites/hot mix plants/traffic detours/borrow areas etc. • The Contractor will submit a copy of agreement to the Environmental Expert of AE. The Environmental Expert will be	Along the Project Road	Contractor	Environmental Expert of AE and PIU

Sl. No.	Environmental Issue	Management Measures	Location	Responsibility	
				Planning and Execution	Supervision/Monitoring
		required to ensure that the clearing up of the site prior to handing over to the owner (after construction or completion of the activity) is included in the contract.			
P16	Implementation -Information Meetings	• The contractor will organize at least 2 implementation information meetings in the vicinity of Project Site (minimum one in each section) for general public to consult and inform people about his plans covering overall construction schedule, safety, use of local resources (such as earth, water), traffic safety and management plans of debris disposal, drainage protection during construction, pollution abetment and other plans, measures to minimize disruption, damage and in convenience to roadside users and people along the road. • The first Implementation information meeting be conducted within four weeks of mobilization. The people should be informed about the date, time and venue at least 7 days prior to meetings. Public shall be informed about the meeting through display of posters at prominent public places (panchayat offices, offices of Market committees, Notice board of religious places etc.) and distribution of pamphlets along roadside communities or in any manner deemed fit. • The contractor will maintain a channel of communication with the communities through his designated Environment and Safety Officer to address any concern or grievances. • Periodic meetings will also be conducted during the construction period to take feedback from communities or their representatives to ensure minimum disturbance. The mechanism and contents for disclosure shall be approved by PIU prior to the meetings.	Along the Project Road	Contractor	Environmental Expert of AE and PIU
CONSTRUCTION STAGE					
C1	Clearing and Grubbing	• Vegetation will be removed (if any) from the construction zone before commencement of construction. All works will be carried out such that the damage or disruption to flora other than those identified for cutting is minimum. • Only ground cover/shrubs that impinge directly on the permanent works or	Project Road	Contractor	Environmental Expert of AE and PIU

Sl. No.	Environmental Issue	Management Measures	Location	Responsibility	
				Planning and Execution	Supervision/Monitoring
		necessary temporary works will be removed with prior approval from the Environmental Expert of AE. The Contractor under any circumstances will not cut trees other than those identified for cutting and for which he has written instructions from the PIU. The PIU will issue these instructions only after receiving all stages of clearances from the Forest Department/ MoEF& CC.			
C2	Disposal of debris from dismantling structures and road surface	The contractor shall identify disposal sites. The identified locations will be reported to the Environmental Expert of AE. These locations will be checked on site and accordingly approved by Environmental Expert of AE prior to any disposal of waste materials. All arrangements for transportation during construction including provision, maintenance, dismantling and clearing debris, will be considered incidental to the work and will be planned and implemented by the contractor as approved and directed by the Environmental Expert of AE. The pre-designed disposal locations will be a part of Comprehensive Solid Waste Management Plan to be prepared by Contractor in consultation and with approval of Environmental Expert of AE. Debris generated from pile driving or other construction activities shall be disposed such that it does not flow into the surface water bodies or form mud puddles in the area.	Project Road	Contractor	Environmental Expert of AE and PIU
C3	Other Construction Waste Disposal	The pre-identified disposal locations will be a part of Comprehensive Waste Disposal Management Plan to be prepared by the Contractor in consultation and with approval of Environmental Expert of AE. Location of disposal sites will be finalized prior to initiation of works on any particular section of the road. The Environmental Expert of AE will approve these disposal sites after conducting a joint inspection on the site with the Contractor. Contractor will ensure that any spoils of material unsuitable for embankment fill will not be disposed off near any water course, agricultural land, and natural	Project Road	Contractor	Environmental Expert of AE and PIU

Sl. No.	Environmental Issue	Management Measures	Location	Responsibility	
				Planning and Execution	Supervision/Monitoring
		habitat like grass lands or pastures. Such spoils from excavation can be used to reclaim borrow pits and low-lying areas located in barren lands along the project corridors (if so desired by the owner/community and approved by the Environmental Expert of AE). All waste materials will be completely disposed and the site will be fully cleaned and certified by Environmental Expert of AE before handing over. The contractor at its cost shall resolve any claim, arising out of waste disposal or any non-compliance that may arise on account of lack of action on his part.			
C4	Stripping, stocking and preservation of top soil	The topsoil from all areas of cutting and all areas to be permanently covered will be stripped to a specified depth of 150 mm and stored in stockpiles. A portion of the temporarily acquired area and/or Right of Way will be earmarked for storing topsoil. The locations for stock piling will be pre-identified in consultation and with approval of Environmental Expert of AE. The following precautionary measures will be taken to preserve them till they are used: Stockpile will be designed such that the slope does not exceed 1:2 (vertical to horizontal), and height of the pile is restricted to 2 m. To retain soil and to allow percolation of water, silt fencing will protect the edges of the pile. Stockpiles will not be surcharged or otherwise loaded and multiple handling will be kept to a minimum to ensure that no compaction will occur. The stockpiles shall be covered with gunny bags or vegetation. It will be ensured by the contractor that the topsoil will not be unnecessarily trafficked either before stripping or when in stockpiles. Such stockpiled topsoil will be utilized for - covering all disturbed areas including borrow areas only in case where these are to be rehabilitated as farm lands (not those in barren areas) top dressing of the road embankment and fill slopes, filling up of tree pits, in the median and in the agricultural fields of farmers,	Project Road	Contractor	Environmental Expert of AE and PIU

Sl. No.	Environmental Issue	Management Measures	Location	Responsibility	
				Planning and Execution	Supervision/Monitoring
		acquired temporarily.			
C5	Accessibility	The contractor will provide safe and convenient passage for vehicles, pedestrians and livestock to and from roadsides and property accesses connecting the project road, providing temporary connecting road. The contractor will take care that schools and religious places are accessible to Public. The contractor will also ensure that the work on / at existing accesses will not be undertaken without providing adequate provisions and to the prior satisfaction of Environmental Expert of AE. The contractor will take care that the cross roads are constructed in such a sequence that construction work over the adjacent cross roads are taken up one after one so that traffic movement in any given area not get affected much.	Project Road	Contractor	Environmental Expert of AE and PIU
C6	Planning for Traffic Diversions and Detours	Temporary diversions will be constructed with the approval of the Resident Engineer and Environmental Expert of AE for which contractor will seek prior approval for such plans. Detailed Traffic Control Plans will be prepared and submitted to the Resident Engineer for approval, seven days prior to commencement of works on any section of road. The traffic control plans shall contain details diversions; traffic safety arrangement during construction; safety measures for night – time traffic and precautions for transportation of hazardous materials. Traffic control plans shall be prepared in line with requirements of IRC's SP- 55 document and The Contractor will ensure that the diversion/detour is always maintained in running condition, particularly during the monsoon to avoid disruption to traffic flow. The contractor will also inform local community of changes to traffic routes, conditions and pedestrian access arrangements with assistance from AE and PIU. The temporary traffic detours will be kept free of dust by sprinkling of water three times a day and as required under specific conditions (depending on weather conditions, construction in the	Project Road	Contractor	Environmental Expert of AE and PIU

Sl. No.	Environmental Issue	Management Measures	Location	Responsibility	
				Planning and Execution	Supervision/Monitoring
		settlement areas and volume of traffic).			
C7	Earth from Borrow Areas for Construction	No borrow area will be opened without permission of the Environmental Expert of AE. The location, shape and size of the designated borrow areas will be as approved by the Environmental Expert of AE and in accordance to the IRC recommended practice for borrow pits for road embankments (IRC 10: 1961). The borrowing operations will be carried out as specified in the guidelines for sitting and operation of borrow areas. The unpaved surfaces used for the haulage of borrow materials, if passing through the settlement areas or habitations; will be maintained dust free by the contractor. Sprinkling of water will be carried out twice a day to control dust along such roads during their period of use. During dry seasons (winter and summer) frequency of water sprinkling will be increased in the settlement areas and Environmental Expert of AE will decide the numbers of sprinkling depending on the local requirements. Contractor will rehabilitate the borrow areas as soon as borrowing is over from a particular borrow area in accordance with the guidelines for Redevelopment of Borrow Areas or as suggested by Environmental Expert of AE. The final rehabilitation plans will be approved by the Environmental Expert of AE.	Borrow Areas	Contractor	Environmental Expert of AE and PIU
C8	Quarry Operations	The contractor shall obtain materials from quarries only after the consent of the Department of Mining / SPCB (both the states) / District Administration or will use existing approved sources of such materials. Copies of consent/ approval/ rehabilitation plan for opening a new quarry or use of an existing quarry source will be submitted to Environmental Expert of AE and the Resident Engineer. The contractor will develop a Comprehensive Quarry Redevelopment plan, as per the Mining Rules of the state and submit a copy to PIU and AE prior to opening of the quarry site. The quarry operations will be undertaken within the rules and	Quarry Areas	Contractor	Environmental Expert of AE and PIU

Sl. No.	Environmental Issue	Management Measures	Location	Responsibility	
				Planning and Execution	Supervision/Monitoring
		regulations in force in the state.			
C9	Transporting Construction Materials and Haul Road Management	Contractor will maintain all roads (existing or built for the project), which are used for transporting construction materials, equipment and machineries as précised. All vehicles delivering fine materials to the site will be covered to avoid spillage of materials. All existing highways and roads used by vehicles of the contractor or any of his sub-contractor or suppliers of materials and similarly roads, which are part of the works, will be kept clear of all dust/mud or other extraneous materials dropped by such vehicles. Contractor will arrange for regular water sprinkling as necessary for dust suppression of all such roads and surfaces with specific attention to the settlement areas. The unloading of materials at construction sites/close to settlements will be restricted to daytime only.	All Roads Used	Contractor	Environmental Expert of AE and PIU
C10	Construction Water	Contractor will arrange adequate supply and storage of water for the whole construction period at his own costs. The Contractor will submit a list of source/s from where water will be used for the project to 'PIU' through the Engineer. The contractor will source the requirement of water preferentially from ground water but with prior permission from the Central Ground Water Board. A copy of the permission will be submitted to 'PIU' through the Engineer prior to initiation of construction. The contractor will take all precaution to minimize the wastage of water in the construction process/ operation.	Along the Project	Contractor	Environmental Expert of AE and PIU
C11	Disruption to Other Users of Water	While working across or close to any perennial water bodies, contractor will not obstruct/ prevent the flow of water. Construction over and close to the perennial streams shall not be undertaken in any season. The contractor will take prior approval of the River Authority or Irrigation Department for any such activity. The PIU and the Engineer will ensure that contractor has served the notice to the downstream users of water well in	All Water Bodies Used	Contractor	Environmental Expert of AE and PIU

Sl. No.	Environmental Issue	Management Measures	Location	Responsibility	
				Planning and Execution	Supervision/Monitoring
		advance.			
C12	Drainage	Contractor will ensure that no construction materials like earth, stone, ash or appendage is disposed off in a manner that blocks the flow of water of any water course and cross drainage channels. Contractor will take all-necessary measures to prevent any blockage to water flow. In addition to the design requirements, the contractor will take all required measures as directed by the Environmental Expert of AE and the 'Resident Engineer' to prevent temporary or permanent flooding of the site or any adjacent area. To maintain the surface water flow/drainage, proper mitigation measures will be taken along the road, like: Drainage line will be constructed all along the project road. Good engineering and construction practice should be followed Use of sediment traps, silt fencing, oil and grease turfing etc. to minimize of the soil movement.	Drainage line along the road	Contractor	Environmental Expert of AE and PIU
C13	Siltation of Water Bodies and Degradation of Water Quality	The Contractor will not excavate beds of any stream/canals/ any other water body for borrowing earth for embankment construction. Contractor will construct silt fencing at the base of the embankment construction for the entire perimeter of water bodies (including wells) adjacent to the ROW and around the stockpiles at the construction sites close to water bodies. The fencing will be provided prior to commencement of earthwork and continue till the stabilization of the embankment slopes, on the particular sub-section of the road. The contractor will also put up sedimentation cum grease traps at the outer mouth of the drains located in truck lay byes and bus bays which are ultimately entering into any surface water bodies / water channels with a fall exceeding 1.5 m. in present case three Sedimentation Cum Grease Trap are proposed, However the item has been kept in case need arises during construction. Contractor will ensure that construction	All Surface Water Bodies Along the Road	Contractor	Environmental Expert of AE and PIU

Sl. No.	Environmental Issue	Management Measures	Location	Responsibility	
				Planning and Execution	Supervision/Monitoring
		materials containing fine particles are stored in an enclosure such that sediment-laden water does not drain into nearby watercourse.			
C14	Slope Protection and Control of Soil Erosion	The contractor will take slope protection measures as per design, or as directed by the Environmental Expert of AE to control soil erosion and sedimentation. All temporary sedimentation, pollution control works and maintenance thereof will be deemed as incidental to the earth work or other items of work and as such as no separate payment will be made for them. Contractor will ensure the following aspects: 1. During construction activities on road embankment, the side slopes of all cut and fill areas will be graded and covered with stone pitching, grass and shrub as per design specifications. 2. Turfing works will be taken up as soon as possible provided the season is favorable for the establishment of grass sods. Other measures of slope stabilization will include mulching netting and seeding of batters and drains immediately on completion of earthworks. 3. In borrow pits, the depth shall be so regulated that the sides of the excavation will have a slope not steeper than 1 vertical to 2 horizontal, from the edge of the final section of the bank. 4. Along sections abutting water bodies, stone pitching as per design specification will protect slopes.	Along the Roads	Contractor	Environmental Expert of AE and PIU
C15	Water Pollution from Construction Wastes	The Contractor will take all precautionary measures to prevent the wastewater generated during construction from entering into streams, water bodies or the irrigation system. Contractor will avoid construction works close to the streams or water bodies. All waste arising from the project is to be disposed off in the manner that is acceptable and as per norms of the State Pollution Control Board.	Along the road	Contractor	Environmental Expert of AE and PIU
C16	Water Pollution from Fuel and Lubricants	The contractor will ensure that all construction vehicle parking location, fuel/lubricants storage sites, vehicle, machinery and equipment maintenance and refueling sites will be located at least 500 m from rivers and irrigation	Along the Roads	Contractor	Environmental Expert of AE and PIU

Sl. No.	Environmental Issue	Management Measures	Location	Responsibility	
				Planning and Execution	Supervision/Monitoring
		canal/ponds. All location and layout plans of such sites will be submitted by the Contractor prior to their establishment and will be approved by the Environmental Expert of AE and PIU. Contractor will ensure that all vehicle/machinery and equipment operation, maintenance and refueling will be carried out in such a fashion that spillage of fuels and lubricants does not contaminate the ground. Oil interceptors will be provided for vehicle parking, wash down and refueling areas as per the design provided. Oil and grease traps will be provided at fuelling locations, to prevent contamination of water. 'Oil interceptors' shall be provided in wash down areas and re-fuelling areas In all, fuel storage and refueling areas, if located on agricultural land or areas supporting vegetation, the top soil will be stripped, stockpiled and returned after cessation of such storage. Contractor will arrange for collection, storing and disposal of oily wastes to the pre-identified disposal sites (list to be submitted to AE and PIU) and approved by the Environmental Expert of AE. All spills and collected petroleum products will be disposed off in accordance with MoEF&CC and state PCB guidelines. Environmental Expert of AE and Resident Engineer' will certify that all arrangements comply with the guidelines of PCB/ MoEF&CC or any other relevant laws.			
C17	Dust Pollution	The contractor will take every precaution to reduce the level of dust from crushers/hot mix plants, construction sites involving earthwork by sprinkling of water, encapsulation of dust source and by erection of screen/barriers. All the plants will be sited at least 1 km in the downwind direction from the nearest human settlement. The contractor will provide necessary certificates to confirm that all crushers used in construction conform to relevant dust emission control legislation.	Along the Roads, Construction Site/ Camps	Contractor	Environmental Expert of AE and PIU

Sl. No.	Environmental Issue	Management Measures	Location	Responsibility	
				Planning and Execution	Supervision/Monitoring
		The suspended particulate matter value at a distance of 40m from a unit located in a cluster should be less than 500 g/m3. The pollution monitoring is to be conducted as per the monitoring plan. Alternatively, only crushers licensed by the SPCB shall be used. Required certificates and consents shall be submitted by the Contractor in such a case to the Environmental Expert of AE through the 'Engineer'. Dust screening vegetation will be planted on the edge of the ROW for all existing roadside crushers. Hot mix plant will be fitted with dust extraction units.			
C18	Emission from Construction Vehicles, Equipment and Machineries	Contractor will ensure that all vehicles, equipment and machinery used for construction are regularly maintained and confirm that pollution emission levels comply with the relevant requirements of SPCB. The Contractor will submit PUC certificates for all vehicles/ equipment/machinery used for the project. Monitoring results will also be submitted to 'PIU' through the 'Engineer'.	Along the Roads , all vehicles used/ Camps	Contractor	Environmental Expert of AE and PIU
C19	Noise Pollution: Noise from Vehicles, Plants and Equipments	The Contractor will confirm the following: All plants and equipment used in construction shall strictly conform to the MoEF& CC/CPCB noise standards. All vehicles and equipment used in construction will be fitted with exhaust silencers. Servicing of all construction vehicles and machinery will be done regularly and during routine servicing operations, the effectiveness of exhaust silencers will be checked and if found defective will be replaced. Limits for construction equipment used in the project such as compactors, rollers, front loaders, concrete mixers, cranes (moveable), vibrators and saws shall not exceed 75 dB (A) (measured at one meter from the edge of equipment in the free field), as specified in the Environment (Protection) rules, 1986. Maintenance of vehicles, equipment and machinery shall be regular to keep noise levels at the minimum.	Along the Roads , all vehicles used/Camps	Contractor	Environmental Expert of AE and PIU

Sl. No.	Environmental Issue	Management Measures	Location	Responsibility	
				Planning and Execution	Supervision/Monitoring
		At the construction sites within 150 m of the nearest habitation, noisy construction work such as crushing, concrete mixing, batching will be stopped during the night time between 10.00 pm to 6.00 am. No construction activities will be permitted around educational institutes/health centers (silence zones) up to a distance of 100 m from the sensitive receptors i.e., school, health centers and hospitals between 10.00 pm to 6.00 am. Monitoring shall be carried out at the construction sites as per the monitoring schedule and results will be submitted to Environmental Expert of AE through the 'Engineer'.			
C20	Personal Safety Measures for Labour	Contractor will provide: Protective footwear and protective goggles to all workers employed on mixing asphalt materials, cement, lime mortars, concrete etc. Welder's protective eye-shields to workers who are engaged in welding works Protective goggles and clothing to workers engaged in stone breaking activities and workers will be seated at sufficiently safe intervals Earplugs to workers exposed to loud noise, and workers working in crushing, compaction, or concrete mixing operation. Adequate safety measures for workers during handling of materials. The contractor will comply with all regulations regarding safe scaffolding, ladders, working platforms, gangway, stairwells, excavations, trenches and safe means of entry and egress. • The contractor will comply with all the precautions as required for ensuring the safety of the workmen as per the International Labor Organization (ILO) Convention No. 62 as far as those are applicable to this contract. The contractor will make sure that during the construction work all relevant provisions of the Factories Act, 1948 and the Building and other Construction Workers (regulation of Employment and Conditions of Services) Act, 1996 are adhered to.	Along the Roads, all vehicles used/Camps	Contractor	Environmental Expert of AE and PIU

Sl. No.	Environmental Issue	Management Measures	Location	Responsibility	
				Planning and Execution	Supervision/Monitoring
		The contractor will not employ any person below the age of 14 years for any work and no woman will be employed on the work of painting with products containing lead in any form. The contractor will also ensure that no paint containing lead or lead products is used except in the form of paste or readymade paint. Contractor will provide facemasks for use to the workers when paint is applied in the form of spray or a surface having lead paint dry is rubbed and scrapped. The Contractor will mark 'hard hat' and 'no smoking' and other 'high risk' areas and enforce non-compliance of use of PPE with zero tolerance. These will be reflected in the Construction Safety Plan to be prepared by the Contractor during mobilization and will be approved by AE and PIU.			
C21	Traffic and Safety	The contractor will take all necessary measures for the safety of traffic during construction and provide, erect and maintain such barricades, including signs, markings, flags, lights and flagmen as proposed in the Traffic Control Plan/Drawings and as required by the Environmental Expert of AE and 'Resident Engineer' for the information and protection of traffic approaching or passing through the section of any existing cross roads. The contractor will ensure that all signs, barricades, pavement markings are provided as per the MOSRT&H specifications. Before taking up of construction on any section of the existing lanes of the highway, a Traffic Control Plan will be devised and implemented to the satisfaction of Environmental Expert of AE and 'Resident Engineer'	Along the Roads, all vehicles used/Camps	Contractor	Environmental Expert of AE and PIU
C22	Risk from Electrical Equipment(s)	The Contractor will take all required precautions to prevent danger from electrical equipment and ensure that: No material will be so stacked or placed as to cause danger or inconvenience to any person or the public. All necessary fencing and lights will be provided to protect the public in construction zones. All machines to be used in the	Along the Roads	Contractor	Environmental Expert of AE and PIU

Sl. No.	Environmental Issue	Management Measures	Location	Responsibility	
				Planning and Execution	Supervision/Monitoring
		construction will conform to the relevant Indian Standards (IS) codes, will be free from patent defect, will be kept in good working order, will be regularly inspected and properly maintained as per IS provision and to the satisfaction of the 'Resident Engineer'.			
C23	Risk Force Measure	• The contractor will take all reasonable precautions to prevent danger to the workers and public from fire, flood etc. resulting due to construction activities. • The contractor will make required arrangements so that in case of any mishap all necessary steps can be taken for prompt first aid treatment. Construction Safety Plan prepared by the Contractor will identify necessary actions in the event of an emergency.	Along the Roads, construction Camps	Contractor	Environmental Expert of AE and PIU
C24	First Aid	• The contractor will arrange for - • a readily available first aid unit including an adequate supply of sterilized dressing materials and appliances as per the Factories Rules in every work zone • availability of suitable transport at all times to take injured or sick person(s) to the nearest hospital • Equipment and trained nursing staff at construction camp.	Along the Roads, construction Camps	Contractor	Environmental Expert of AE and PIU
C25	Informatory Signs and Hoardings	• The contractor will provide, erect and maintain informatory/safety signs, hoardings written in English and local language, wherever required as per IRC and MoRT&H specifications.	Along the Roads, construction Camps	Contractor	Environmental Expert of AE and PIU
C26	Road side Plantation Strategy	• The contractor will do the plantation at median and/or turfing at embankment slopes as per the tree plantation strategy prepared for the project. • Minimum 90 percent survival rate of the saplings will be acceptable otherwise the contractor will replace dead plants at his own cost. The contractor will maintain the plantation till they handover the project site to NHAI. • Environmental Expert of AE will inspect regularly the survival rate of the plants and compliance of tree plantation guidelines.	Along the Roads	Contractor	Environmental Expert of AE and PIU
C27	Flora and Fauna	• The contractor will take reasonable precaution to prevent his workmen or any other persons from removing and damaging any flora (plant/vegetation) and fauna (animal) including fishing in any water body and hunting of any	Along the Roads	Contractor	Environmental Expert of AE and PIU

Sl. No.	Environmental Issue	Management Measures	Location	Responsibility	
				Planning and Execution	Supervision/Monitoring
		animal. • If any wild animal is found near the construction site at any point of time, the contractor will immediately upon discovery thereof acquaint the Environmental Expert of AE and carry out the AE instructions for dealing with the same. • Environmental Expert of AE will report to the nearby forest office (range office or divisional office) and will take appropriate steps/ measures, if required in consultation with the forest officials. • All efforts during the design stage should be made to minimize the tree felling requirement • Compensatory plantation should be started during construction phase parallel to the construction activities.			
C28	Chance Found Archaeological Property	• All fossils, coins, articles of value of antiquity, structures and other remains or things of geological or archaeological interest discovered on the site shall be the property of the Government and shall be dealt with as per provisions of the relevant legislation. • The contractor will take reasonable precautions to prevent his workmen or any other persons from removing and damaging any such article or thing. He will, immediately upon discovery thereof and before removal acquaint the Environmental Expert of AE of such discovery and carry out the AE instructions for dealing with the same, waiting which all work shall be stopped. • The AE will seek direction from the Archaeological Survey of India (ASI) before instructing the Contractor to recommence the work in the site.	Along the Roads, construction sites/Camps	Contractor	Environmental Expert of AE and PIU
C29	Labour Accommodation	• Contractor will follow all relevant provisions of the Factories Act, 1948 and the building and the other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 for construction and maintenance of labor camp. • The location, layout and basic facility provision of each labor camp will be submitted to AE and 'PIU' prior to their construction. • The construction will commence only upon the written approval of the Environmental Expert of AE.	Along the Roads, construction Camps/site	Contractor	Environmental Expert of AE and PIU

Sl. No.	Environmental Issue	Management Measures	Location	Responsibility	
				Planning and Execution	Supervision/Monitoring
		• The contractor will maintain necessary living accommodation and ancillary facilities in functional and hygienic manner and as approved by the AE. • The sewage system for such camps will be properly designed and built so that no water pollution takes place in adjacent canals			
C30	Potable Water	• The Contractor will construct and maintain all labour accommodation in such a fashion that uncontaminated water is available for drinking, cooking and washing. • The Contractor will also provide potable water facilities within the precincts of every workplace in an accessible place, as per standards set by the building and other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996. • Testing of water will be done as per parameters prescribed in IS 10500:1991.	Along the Roads, construction Camps/construction site	Contractor	Environmental Expert of AE and PIU
C31	Sanitation and Sewage System	• The contractor will ensure that - • the sewage system for the camp are designed, built and operated in such a fashion that no health hazards occurs and no pollution to the air, ground water or adjacent water courses take place • separate toilets/bathrooms, wherever required, screened from those from men (marked in vernacular) are to be provided for women • Adequate water supply is to be provided in all toilets and urinals	Along the Roads, construction Camps/Construction Sites	Contractor	Environmental Expert of AE and PIU
C32	Waste Disposal	• The contractor will provide garbage bins in the camps and ensure that these are regularly emptied and disposed off in a hygienic manner as per the Comprehensive Solid Waste Management Plan approved by the Environmental Expert of AE. • Unless otherwise arranged by local sanitary authority, arrangements for disposal of night soils (human excreta) suitably approved by the local medical health or municipal authorities or as directed by Environmental Expert of AE will have to be provided by the contractor.	Along the Roads, construction Camps	Contractor	Environmental Expert of AE and PIU
C33	Consultation	• The Environmental Expert of AE will contact the responsible people with the enhancement drawing of the site for which enhancement has been proposed	Along the Roads	Contractor	Environmental Expert of AE and PIU

Sl. No.	Environmental Issue	Management Measures	Location	Responsibility	
				Planning and Execution	Supervision/Monitoring
		and take their consent before the start of work. • Accesses to Different Schools along the road will be developed to the satisfaction of 'PIU'.			
C34	Clean-up Operations, Restoration and Rehabilitation	• Contractor will prepare site restoration plans, which will be approved by the Environmental Expert of AE. The clean-up and restoration operations are to be implemented by the contractor prior to demobilization. The contractor will clear all temporary structures; dispose all garbage, night soils and POL waste as per Comprehensive Waste Management Plan and as approved by AE. • All disposal pits or trenches will be filled in and effectively sealed off. Residual topsoil, if any will be distributed in pre identified approved areas or in places suggested by the Environmental Expert of AE areas in a layer of thickness of 75 mm-l50 mm. All construction zones including river-beds, culverts, road-side areas, camps, hot mix plant sites, crushers, batching plant sites and any other area used/affected by the project will be left clean and tidy, at the contractor's expense, to the entire satisfaction to the Environmental Expert of AE and PIU will certify in this regard.	Along the Roads, construction Camps	Contractor	Environmental Expert of AE and PIU
C35	Loss of natural stability of slopes	• The provisions of retaining walls, breast walls, parapet walls,' railings, edge stones, toe walls, check-walls, and river training structures etc	Project Road	Contractor	Environmental Expert of AE and PIU
C36	Road Safety	• Pedestrian guard rail is an important pedestrian safety proposal. It has been proposed to compel/encourage the pedestrians to walk over the footpaths rather than main carriageways. • Provision of tree barricades has been made to alert the pedestrians. • Collapsible traffic barricades have been proposed in front of public places like educational institutions, community centers, churches etc.	Along the Roads	Contractor	Environmental Expert of AE and PIU

Sl. No.	Environmental Issue	Management Measures	Location	Responsibility	
				Planning and Execution	Supervision/Monitoring
		• Other traffic calming measures like rumble strips and speed limit signs are proposed especially in the vicinity of educational institutions • During construction phase dedicated safety team will look after the entire community and labour safety.			
C37	Energy Conservation	• Provision of Solar Street Lights has been made on two roads viz. Civil Hospital to LutiLongshylla and Approach road to Kiang Nangbah Monument.	Project Road	Contractor	Environmental Expert of AE and PIU
C38	• Drainage System	• The drainage needs periodic maintenance in terms of debris removal, weed control and is need to be semiannual activity throughout the lifecycle of the existing drainage	Project Road	Contractor	Environmental Expert of AE and PIU
OPERATION STAGE					
Activities to be carried Out by PIU					
O1	Monitoring Operation Performance	• The PIU will monitor the operational performance of the various mitigation/ enhancement measures carried out as a part of the project. • The indicators selected for monitoring include the survival rate of trees; utility of enhancement provision, status of rehabilitation of borrow areas and disposal sites,	Along the Road	PIU	PIU
O2	Maintenance of Drainage	• PIU will ensure that all drains (side drains, median drain and all cross drainages) are periodically cleared especially before monsoon season to facilitate the quick passage of rainwater and avoid flooding. • PIU will ensure that all the sediment and oil and grease traps set up at the water bodies are cleared once in every three months.	Along the Road	PIU	PIU
O3	Pollution Monitoring	• The periodic monitoring of the ambient air quality, noise level, water quality, soil pollution/contamination in the selected locations as suggested in pollution monitoring plan. • PIU will either appoint PCB or its	Along the Road	PIU through Pollution Monitoring Agency	PIU

Sl. No.	Environmental Issue	Management Measures	Location	Responsibility	
				Planning and Execution	Supervision/Monitoring
		approved pollution-monitoring agency for the purpose			
O4	Air Pollution	• Ambient air concentrations of various pollutants shall be monitored as envisaged in the pollution-monitoring plan. • Bottlenecks should be avoided for smooth flow of traffic. • Plantation of pollutant adsorbing trees, such as Spider Plant, Bamboo Palm, etc. • Regular maintenance of the road will be done to ensure good surface condition	Along the Road	PIU through Pollution Monitoring Agency	PIU
O5	Noise Pollution	• Noise pollution will be monitored as per monitoring plan at sensitive locations. Noise control programs are to be enforced strictly. • According to monitoring results, use of sound barriers / trees will be considered where warranted • Signs for sensitive zones (health centers / educational institutions etc.) will be put up where horn should not be blown or traffic speed need to be regulated • Pressure Horn must be banned in the project road	Along the Road	PIU through Pollution Monitoring Agency	PIU
O6	Water Pollution	• Water Quality will be monitored as per monitoring plan	Along the Road	PIU through Pollution Monitoring Agency	PIU
O7	Plantaton (Flora and Fauna)	• Monitoring of survival of trees should be done at regular interval and suitable mitigation measures should be taken to protect the trees. • Efforts will be made for proper maintenance of planted trees, shrubs and grasses to maintain greenery and aesthetics • Planted tree should be covered with fence or net	Along the Road	PIU through Pollution Monitoring Agency	PIU
O8	Soil Erosion and Monitoring of Borrow Areas	• Visual monitoring and inspection of soil erosion at borrow areas, quarries (if closed and rehabilitated), embankment > 2m. and other places expected to be affected, will be carried out once in every three months as suggested in monitoring plan.In case soils erosion is found, suitable measures should be taken to control the soil erosion.	Along the Road	PIU	PIU
O9	Road Safety and Traffic	• Road Safety will be monitored during operation especially at location where traffic-calming measures have been proposed.	Along the Road	PIU	PIU

Sl. No.	Environmental Issue	Management Measures	Location	Responsibility	
				Planning and Execution	Supervision/Monitoring
		• The spills at the accident sites will be cleared immediately and disposed off properly in accordance with Emergency Response Plan • Traffic management plan will be developed, especially along congested locations and near sensitive locations • Traffic control measures including speed limits will be enforced strictly. • Engagement with local community / Awareness Training			
O10	• Drainage System	• The drainage needs periodic maintenance in terms of debris removal, weed control and is need to be semiannual activity throughout the lifecycle of the existing drainage	Project Road	PIU	PIU

13.5 Reporting System

The Monitoring and Evaluation of the management measures envisaged are critical activities in implementation of the Project. The rationale for a reporting system is based on accountability to ensure that the measures proposed as part of the Environmental Management Plan get implemented in the Project.

Project Monitoring Cell will be set up in the PIU, which will act as the Contract Management Unit (CMU) and will be responsible for execution of the Project. Project Execution Units will be set up under the supervision of the Contract Management Unit for the Contract Package.

13.6 Technical set up

It is proposed that an Environmental Management Implementation Unit (EMIU) will be set up within PIU. The EMIU will have an Environmental Expert who will be responsible for monitoring the implementation of the EMP with the assistance of the Environmental Expert/Specialist of the AE/IE and the Contractor. The Environmental Expert will be assisted by two Environmental Engineers. The EMIU of PIU will assist the CMU and the Project Director and will interact with State Pollution Control Board (SPCB), State Forest Dept., NGO & various Committees for addressable of environmental issues. In the PIU, there will be an Environmental Officer within the Project Management Information System Unit who will assist the Project Director on the environmental matters and also interact with the CMU, PIUs and its EMIUs.

13.7 Nonconformity To Environmental Management Plan (EMP)

The Contractor will implement necessary mitigation measures for which responsibility is assigned to him as stipulated in the EMP. Any lapse in implementing the same will attract the damage clause as detailed below:

- Any complaints of public, within the scope of the Contractor, formally registered with the PIU and communicated to the Contractor, which is not properly addressed within the time period intimated by the PIU shall be treated as a major lapse.
- Non-conformity to any of the mitigation measures like unsafe conditions, non-collection of excavated material (during laying of drainage pipes) regularly and other unattended Environment, Health & Safety (EHS) issues, as stipulated in the EMP Report (other than stated above) shall be considered as a minor lapse.
- On observing any lapses, PIU shall issue a notice to the Contractor, to rectify the same.
- Any minor lapse for which notice was issued and not rectified, first and second reminders shall be given after ten days from the original notice date and first reminder date respectively. Any minor lapse, which is not rectified, shall be treated as a major lapse from the date of issuing the second reminder.
- If a major lapse is not rectified upon receiving the notice PIU shall invoke reduction, in the subsequent interim payment certificate.
- For major lapses, 10% of the interim payment certificate will be withheld, subject to a maximum limit of about 0.5% of the contract value.
- If the lapse is not rectified within one month after withholding the payment, the amount withheld shall be forfeited immediately.

Table 12.2 Environment Management Plan Implementation Budget

Sl. No	Cot of Environment / Migration Plan Description	Unit	Quantity	Unit Rate (Rs.)	Amount (Rs.)
	Obtaining necessary clearances, permission, consent from the concerned departments.	Contractors responsibility			
	Water Sprinkling for dust suppression at site (3 trips/ day)				
	Labour welfare as per norms.				
	Environmental Monitoring (Air, Water, Noise & Soil).	--	--	--	900000/-
	Conducting SwachhataPakhwada, EHS awareness program and Training etc	Lump sum	--	200000	200000/-
	Traffic Safety (Sign Boards, Delineators, Barricades, Cautionary tape etc.)	Lump sum	--	500000	500000/-
	Fire Safety, Workers Safety (PPEs), Electrical Safety, Health Safety (First Aid Facility) etc	Lump sum	--	500000	500000/-
	Miscellaneous/CER	Lump Sum		200000	200000/-
				Total cost	**2300000/-**

13.8 Social Management Plan (SMP)

The aim of this Social Management Plan (SMP) is to mitigate all such unavoidable negative impacts cause due to the project. This (SMP) Plan will be prepared on the basis of project survey findings and consultation with various stakeholders. The plan complies with PWRD, Meghalaya State Laws, the Municipal Act and Regulations.

Socio-economic mitigation measures will consist of policies and actions taken before the implementation of the project with the intention of minimizing the extent of impact. The first step of such mitigation will be to avoid unnecessary acquisition and then decide about the mitigation for the damage which is unavoidable. Mitigation is a long-term effort for reduction of socio-economic impacts on the affected population. The outcome of SIA will be guided by the Resettlement Framework of the project to prepare Social Management Plan (SMP).

In order to conduct socio-economic mitigation, it is necessary to acknowledge the grievance/ dis-satisfaction among the affected persons, identify the genuine grievances, finding the facts behind the grievances, and finally finding out ways to address those grievances.

The main responsibilities of the GRC at both the levels will be to:(i) provide support to local on problems arising from the proposed work; (ii)record the grievances, categorize, and prioritize grievances and resolve them; (iii)immediately inform the EA of serious cases; and (iv) report to locals on developments regarding their grievances and decisions of the GRC.

13.9 Recommendation of SIA to be Implemented

Some key informants and representatives of various organizations have presented some recommendations for implementation of SIA so that the project's adverse impact will be minimized. These are noted below.

- There should be proper awareness campaign at the project sites regarding health and hygiene, awareness about HIV/AIDS, drug and human trafficking with details of the mode of operation, kind of people at high risk and method of mitigation. IEC materials in local language & in picture to be displayed and distributed in the sites, major settlements, Block and ULBs.
- Police administration, health department and block officials should be sensitize to take more proactive role to apprehend any remote chance of human trafficking, particularly of women and girls, drug peddling and risk of HIV/AIDS.

13.10 7.5 Recommendation of the Vulnerable groups

- Provision for institutional credit to the roadside vendors and traders.
- Skill development training to the members of the PAFs.
- Linkages of the locals with the available schemes sponsored by the State and the Central Government.

13.11 7.6 Recommendation for Gender Sensitization

- Implementation of the Vishakha Guidelines as amended as The Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013 in case of sexual harassment against women should be displayed at the project sites and other important location.
- Earmarked parts of parking bays for women two-wheeler drivers and women car drivers to ensure their security.
- Making Sulabh toilets for women workers, with fittings for pregnant and disabled women at the project site.
- Better maintenance of street lighting and roads, especially near education institutions and workplaces of informal sector workers.
- Provision of quality drinking water and sanitation services, including menstrual hygiene facilities for women workers at the project office and other site offices.
- Safer vending and market places at project sites and by the road side.
- Conduct regular trainings of drivers, conductors, auto-drivers and traffic police on sexual harassment in public spaces and what support systems can be accessed.
- Develop protocols and response systems to address sexual harassment in transport facilities and display police and women's helpline numbers prominently in all project offices, public places and important junctions
- Ensure regular patrolling by PCR vans in highly vulnerable areas.
- Ensure presence of visible security, including CCTV at all important and vulnerable locations. Build trust and confidence among female citizens.
- Ensure effective operation of the women's helpline and registering FIRs and other complaints.
- Ensure effective functioning of Sexual Harassment Committees in all institutions and Local Complaint Committees at local, district level that can be accessed by women workers in the informal sector.

14 CHAPTER-XIII: CONCLUSION AND RECOMMENDATIONS

- All the project road stretches have been proposed for overlay.
- No land acquisition required for the project.
- No Tree felling envisaged.
- No Protected/Eco sensitive zones fall in the project corridor.
- No sacred grooves impacted by the project road.
- The environmental and the social impact assessment have been conducted as per the approach/ methodology for conducting ESIA study for all the seven project corridors. All the potential impacts were identified in relation to pre-construction, construction, and operation phases. Social impact assessment study has done within the proposed corridor. The proposed project interventions shall not attract Environmental Clearance (EC) from the SEIAA/EAC.
- Focus Group Discussions (FGD's) were conducted to assess the perception of the people about the proposed project. The stakeholders selected included shop keepers, residents along the road, owners/ workers of local commercial establishments etc. The outcome of the consultations depicts the requirement for the road safety measures; road furniture's (including street lights, additional bus bays, signage's, speed breaker etc,).
- In view of the environmental Impact assessment, there will be temporary negative impacts, arising mainly from construction dust and noise, hauling of construction material, waste and equipment on the project corridors (traffic, dust, safety etc.,), mining of construction material, occupation health and safety aspects, disturbance to the residents, businesses, safety risk to workers, public and nearby buildings due to road excavation works, access impediment to houses and business, disposal of large quantities of construction waste, etc. These are all general impacts that are likely to arise during the road construction works in the settlement areas, and there are well developed methods of mitigation that are suggested in the ESMP. Mitigation will be assured by a program of environmental monitoring conducted during construction and operation to ensure that all measures are implemented, and to determine whether the environment is protected as intended. 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 CSC/PIU.
- The prepared ESMP will assist the Contractor, CSC, and the PIU 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 kept on-site during the construction period at all times. The ESMP shall be included in the bidding document along with appropriate contractual clauses for safeguarding the environment during the project construction and operation (maintenance period). As per the World Bank policy requirements, the prepared safeguard documents shall be disclosed in the World Bank website.

Annexure 1: Details of the Screening Process

Urban Roads (Town roads) and Non-urban roads under MITP (World Bank) initiative. Public Works Department (Roads), Government of Meghalaya

Social Screening Format

General Information:

Name of: Town: **Jowai** Urban/ Rural Area: **Urban**

Tehsil: **Jowai** District: **Jaintia**

1. Does the project activity require additional land area? **No**

2. If response in above question is yes, then fill information against sl. no. 3, 4 & 5 (as applicable), otherwise skip to sl. no. 6

Details	Unit	Quantity	Classification/ Category of land	Present Usage of land
3. Private land required	Acres			
a. No. of land owners affected	Number			
b. Persons whose livelihood is primarily dependent on land likely to be acquired/required	Number			
c. BPL Families (among a+b)	Number			
d. Total Vulnerable Families (including BPL) (among a+b)	Number			
4. Government Land	Acres			
a. Non-Titleholders – Encroachers Families	Number			
b. Non-Titleholders – Squatters Families	Number			
c. Various other users of this Govt. Land; Families	Number			
d. People losing livelihoods/ access due to loss of Govt. Lands project; Families	Number			
5. Tribal Families affected	Number			

6. Residential structures/buildings (permanently) affected due to project activities:

Details	Unit	Quantity

Details	Unit	Quantity
a. Total Affected Families	Number	Nil
b. Title Holders	Number	Not Applicable
c. Non-Titleholders – Encroachers	Number	Not Applicable
d. Non-Titleholders – Squatters	Number	Not Applicable
e. BPL Families losing Dwellings	Number	Not Applicable
f. Total vulnerable families (including BPL)	Number	Not Applicable
g. Total Tribal Families	Number	Not Applicable

7. Commercial units (permanently) affected due to project activities:

Details	Unit	Quantity
a. Total Affected Families	Number	Nil
b. Title Holders	Number	
c. Non-Titleholders – Encroachers	Number	
d. Non-Titleholders – Squatters	Number	
f. BPL Families losing Commercial Properties	Number	
g. Total vulnerable families (including BPL)	Number	
h. Total Tribal Families	Number	
i. Vendors affected	Number	
j. Petty shop keepers & Kiosk affected	Number	

8. Common Property Resources (permanently) Affected: (Please give each type by number)

Description	Unit	Quantity
Religious structure (specify)	Number	Nil
Well	Number	Nil
Waiting Shed/Rain Shelter	Number	4
Schools/Educational/ Cultural Structures	Number	Nil
Government/ Community Structures	Number	Nil

9. Residential and/or Commercial units (temporarily) affected during construction activities:

Details	Unit	Quantity
a. Total Affected Residential/Commercial Families	Number	163
b. Title Holders	Number	126
c. Non-Titleholders – Encroachers	Number	24
d. Non-Titleholders – Squatters	Number	13
e. Vendors affected	Number	17
f. Petty shop keepers & Kiosk affected	Number	20

10. Summary:

S No	Items	Results
1	Total no of Families (permanently) affected due to proposed project activity (Single or multiple impacts)	**21**
2	Total no of BPL Families (permanently) affected due to proposed project activity (Single or multiple impacts)	**6**
3	Total no of vulnerable Families (permanently) affected (including BPL) due to proposed project activity (Single or multiple impacts)	**20**
4	Total no of Tribal Families (permanently) affected (including BPL) due to proposed project activity (Single or multiple impacts)	**19**
5	Total number of Community Property Resources affected	**4**
6.	Total Number of Families temporarily affected during construction	163

11. Result/ Outcome of Social Screening Exercise

Output	Outcome	Triggered for the Project
If the number of affected due to scheme/ sub-project implementation is **less than equal to** 200 persons (all impacts combined together – land, structure, other assets, livelihood, etc) or there is only temporary impact during construction	Abbreviated Resettlement Action Plan (ARAP) required	**ESIA required**
If the number of affected due to scheme/ sub-project implementation is **more than 200 persons** (all impacts combined together – land, structure, other assets, livelihood, etc)	Resettlement Action Plan (RAP) required	Not Applicable

Output	Outcome	Triggered for the Project
If only govt. land, forest land, other department land is impacted and the number of affected persons is nil (all impacts combined together – land, structure, other assets, livelihood, etc)	ARAP/RAP not required	Not Applicable

12. Additional information to be collected about the site:

Sl. No.	Previous usage of site	Response
1	Whether the present site or part of present site ever used for any of the following purposes? Response column whichever is applicable	
	Worshipping sacred trees/ sacred grooves	No
	Burial place	No
	Grazing cattle/ goats	No
	Other small shrines	No
	Other prayers, rituals, annual or seasonal festivals/ rituals	No
	Habitation place of community Gods/ ancestors/ or any other good or bad supernatural forces	No
	Place of offering (animal sacrifice)	No
	Other purposes (e.g. sports, cattle racing, etc)	No
	Sensitive social/ cultural/ historical folk tales or oral history of the site (which may later on influence the project)	No
	Open defecation	No
2	No specific usage/ plain ground/ agricultural	No

Annexure 2: Minutes of meeting with the DPR consultant

Location: Office of CETEST Pvt. Ltd, Kolkata vide Video Conference Mode

Date: 23.12.2021

Time: 4.30 pm

Attendees: Team Leader, DPR with Mr.SwarnavaBandhopadhyay, Environmental Specialist, Mr. Suman Sarkar, Social Specialist and team members of DPR and ESIA Consultant.

Agenda items

Land Acquisition

As discussed with DPR Consultant, there is no requirement of extra land as the proposed alignment and all the proposed structures are well within the existing RoW and thus there is no land acquisition required for this project.

The DPR Consultant assures that there is no proposal for Land Acquisition.

Consultant Comment:

No Land Acquired

Demand for all weather road

The existing pavement condition along the road is very poor. In some portions of the stretch, the existing pavement is damaged with cracks, raveling, rutting edge breaking and potholes and in some stretches it have been observed that the existing bituminous layer is fully damaged and exposed. The overall pavement condition needs to be improvised.

The DPR Consultant has proposed improvement of existing pavement condition by overlaying with BC.

Demand for road lighting

Provision of street lighting is absolutely necessary as it not only act as a prevention of accidents but also an important source of public security intended to reduce crime. Studies have shown that darkness results in a large number of crashes and fatalities, especially those involving pedestrians; pedestrian fatalities are 3 to 6.75 times more likely in the dark than in daylight. Several decades ago, when automobile crashes were far more common, street lighting was found to reduce pedestrian crashes by approximately 50%. Road Furniture and Road Signage are to be introduced at all proper and suitable places.

The DPR Consultant has proposed street lighting in Civil Hospital to LutiLongshylla Road and Approach Road to Kiang Nangbah Monument. Similarly, road signages have also been proposed as given in the Traffic Signage Schedule in Volume VII-Drawings.

Road Safety

Mirror should be placed in turning point of the roads and by placing these mirrors at a suitable height, they allow you to see vehicles coming. The same applies to sharp corners when you can't see oncoming traffic. A strategically placed convex mirror allows you to see what is around the corner and likewise for the oncoming vehicle, hence reducing the probability of road accidents. Proper signage and road furniture are to be integral part of the design.

The DPR Consultant has proposed road signages as given in the Traffic Signage Schedule in Volume VII-Drawings. Convex mirrors not proposed since no potential black spot detected on site.

Storm Water Drain

The Local People demanded storm water drain as much as possible throughout the alignment. At congested area it should also have cover and use as footpath.

The DPR Consultant has proposed Storm Water Drain at all stretches. These can be seen in the applied cross sections viz.1-A,1-B,1-C,1-D,2-A & 2-B.

Car Parking Facilities

There should Car, Public Vehicle and Bus Parking facilities at important Junctions, market place and Schools etc.

The DPR Consultant has proposed car parkings at Civil Hospital to LutiLongshylla Road and Approach Road, Kynrud-Saphlang to Tpep-Pale main road &Kynrud-Saphlang to Tpep-Pale Road link-1.

Bus Shelter and/or Rain Shed

Shelters increase passenger comfort and it's desirable to provide shelters for passengers waiting at the bus stops. They should be designed to accommodate the maximum number of passengers normally waiting, and to provide adequate protection from the weather. Bus Shelter and/or Rain Shed should be proposed at regular intervals.

The DPR Consultant has proposed passenger/public shelter on roads viz. Approach Road to Kiang Nangbah Monument & Approach Road to Civil Hospital.

Rumble stick or speed breakers at important junctions, in front of schools etc.

There should be speed breakers in front of school, church and market place

The DPR Consultant has proposed rumble strips & collapsible traffic barricades which can be referred to in Volume-VII Drawings.

Utility Corridor

There should be utility corridor at underground near the congested place

The DPR Consultant has proposed water pipeline trays which can be referred to in Volume-VII Drawings.

Public Urinal

There should be Public Utility facilities like Toilet, Rest rooms etc. mainly at the Market or Congested Place.

The DPR Consultant has proposed toilet blocks in Civil Hospital to LutiLongshylla Road

Public Transport

There are very few public transports in the total alignment. The frequency of public transport should increase.

As per Clause 2 **Objectives** of the Terms of Reference, increasing the frequency of public transport is out of scope.

Annexure 3:Picture Plate